[COMMITTEE PRINT]

COMPILATION OF MATERIALS ON SPACE AND ASTRONAUTICS

No. 2

ADVANCED RESEARCH PROJECTS AGENCY HEARINGS, REPORTS, MESSAGES, BILLS AND RESOLUTIONS ON OUTER SPACE

SPECIAL COMMITTEE ON SPACE AND ASTRONAUTICS
UNITED STATES SENATE
EIGHTY-FIFTH CONGRESS
SECOND SESSION

APRIL 14, 1958

Printed for the use of the Special Committee on Space and Astronautics

UNITED STATES
GOVERNMENT PRINTING OFFICE
23508 WASHINGTON : 1958

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FOREWORD

During the first 3½ months of the 2d session of the 85th Congress, considerable data on matters relating to the development of outer space was accumulated in hearings, reports, speeches, bills, and resolutions, and by the enactment of two laws.

In this committee print, the second in a series, the staff seeks to bring together additional background information to assist the members of the special committee in their task of formulating permanent legislation for the proper handling by the executive and legislative branches of the Government of problems relating to the future development of outer space.

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THE ADVANCED RESEARCH PROJECTS AGENCY

INTRODUCTION TO THE LEGISLATIVE HISTORY

The present authority and responsibility of the Advanced Research Projects Agency to engage in the development of outer space projects derives from two laws passed during the second session of the 85th Congress (Public Law 85-325 and Public Law 85-322), directives from the Secretary of Defense, and a directive contained in the President's message to the Congress on April 2, 1958, regarding the proposed National Aeronautics and Space Agency. While these documents are basic as an introduction to the subject, it should be understood that the function and organization of advanced research for outer space is currently being discussed in connection with proposals for a permanent organization.

The legislative history of authorization and appropriation for advanced research in the Department of Defense developed almost simultaneously because of the necessity for immediate action in establishing an organization which could proceed without waste of time while final arrangements were being worked out by two committees established by the Congress for this purpose: The House Select Committee on Astronautics and Space Exploration and the Senate Special Committee on Space and Astronautics.

An additional reason for the concurrent action of the Committees on Armed Services and Appropriations was that the Department of Defense originally proceeded upon the assumption that the Secretary had authority to establish ARPA without any additional legislation. Thus it happened that the initial reference of ARPA to the Congress was included in the President's proposal for additional defense appropriations for fiscal year 1958 and was consequently contained in the appropriation bill, H. R. 10146, which was referred to the House Committee on Appropriations. The issue of whether or not the Secretary had such authority arose in the House Armed Services Committee which was just completing its hearings and report on H. R. 9739, a bill to authorize the Secretary of the Air Force to establish and develop certain installations for the national security. The discussion of ARPA occurred, therefore, during the course of the hearings by the committee on the investigation it was then making of national-defense missiles, pursuant to House Resolution 67. Authority for ARPA was added as a floor amendment to H. R. 9739 and was consequently in the bill which passed the House and went to the Senate.

The final result of congressional action on these two bills was the passage of the authorization for advanced research in Public Law 85-325 (H. R. 9739) and of the appropriations in Public Law 85-322 (H. R. 10146).

It is the purpose of this report to trace separately the legislative history of the two bills by quoting pertinent passages from official documents which contain questions raised in the Congress concerning

the problem of establishing an organization for the future development of outer space. Official information on ARPA from the executive branch will also be included. This background data should reveal where the Congress stands on the eve of its task of formulating permanent legislation.

AUTHORIZING LEGISLATION FOR ARPA

On January 7, 1958, H. R. 9739 was referred to the House Armed Services Committee in order to authorize the Secretary of the Air Force to establish and develop certain installations for the national security. These installations included the semiautomatic ground environment system (SAGE), the ballistic missile detection system, ballistic missiles, the alert and dispersal of the Strategic Air Command forces, and other projects designed to accelerate our national defense posture. Full committee hearings were held on January 11, 1958 and on January 14 the committee report was made to the House of Representatives. As explained in the introduction, these documents did not contain a discussion of the Advanced Research Projects Agency inasmuch as it was first brought to the attention of Congress as an item in the supplemental defense appropriation bill for fiscal 1958 (H. R. 10146).

On January 13, 1958, the House Armed Services Committee discussed the main issues involved in establishing ARPA in the Department of Defense.

Secretary of Defense Neil H. McElroy:

> To make certain that these programs move forward, and to administer the development and production of the short-range and long-range missiles, I have established the Office of Director of Guided Missiles, and have appointed William Holaday to that position. Mr. Holaday will utilize existing staff organizations within the Department of Defense and the military departments, insofar as they may be necessary, in carrying out his assigned functions. He is the man to whom I look for the direction of our missile program, and I am prepared to back him with the full authority of the Secretary's Office. He and others will be available to your committee, if you wish further information in this area.
>
> Such long-range programs as the antimissile missile and the military satellite programs are in the research and exploratory development stages. They are important and must be pursued, but they must not distract us from the speedy development of our other missile systems. To handle them, I am establishing within the Department of Defense an Advanced Research Projects Agency, which will be responsible to the Secretary of Defense for the unified direction and management of the antimissile missile program and for outer space projects. I would expect to assign other special projects of this general nature to this agency from time to time in the future.
>
> The Agency will not be expected to take over research and development of weapons systems which fall clearly within the mission of any one of the military departments. It is contemplated that programs assigned to the Agency will be developed in full coordination with the military departments to the point

where they are approaching operational capability so that they may be phased into the operation of one or more of the military services with no loss of time or interruption of development and production. We propose to establish the new Agency promptly and appoint a highly qualified director. The Director will have authority to arrange for the performance of work by other agencies of Government, including the military departments, to enter into contracts with private business or educational and research institutions, or to perform work directly with his own staff and facilities.

By this means we can be certain that a strong effort is being placed behind these programs of the future, without detracting from the development work going on in connection with our current missile programs.

* * * * * * *

The advance in technical knowledge which has been most recently observed in the development of the entire system of missiles and in satellites makes all of us in the Defense Department realize that the weapons of the future may be the kinds of things that none of us can quite visualize. They may be of forms which are really not the kinds of things that even the comic strips can dream of today, as they seem to have done about the spaceships in the past.

Because of that, it seems to us quite obvious that to expect the weapons of the future might fall into a traditional type of service category or service area of responsibility is something which one cannot do. We think we need to have the Advanced Research Project Agency first of all—and we will ask that the agency stick to this for a period of time—to take these two areas, the anti-missile missile and the various satellite projects that are of interest to defense and concentrate on those partly because they are likely to go in one or another direction from an operational service standpoint, and until that is cleared by the development of the weapons system itself we feel it is important to keep the research and development on that very advanced system in the Department of Defense without any particular service connection.

Now, as to the future, we can only speculate about that. But one thing that seems to us in defense to be very important is that with the very innovational kinds of future weapons which I think no one can really write the ticket about, there be an agency like this in existence which can pick up a dreamed-of idea at an early stage and be sure that we don't miss the possibilities of that, and evaluate what its future possibilities may be, and may make some initial steps in researching this without any development work being spent and bring it back into the same agency for future development if that seems to be warranted.

The CHAIRMAN. Well, now, two points I am trying to develop. Will there be overlapping in Mr. Holaday's department with the Advanced Research Projects Agency?

I see from your language here that it could be, unless it is carefully guarded by you.

Now, I also see—time is running out—that you are asking for this agency to have contract authority to make contracts by the

Advanced Research Projects Agency. Now, I am not going to take the time to discuss it this morning, but that certainly must be a question this committee must look into, to see if the Department of Defense has authority under the law to make contracts or if the contracts are to be made through the various departments—the Army, Navy, and Air Force.[1]

* * * * * * *

Mr. BROOKS. My analysis is this. We got results on the Manhattan project.

Now, wouldn't it therefore follow—and I would have thought, really frankly, that you would have looked into the organization—wouldn't we get results, too, if we followed the same procedure on the guided missiles?

Secretary MCELROY. Well, let me say I have looked into the Manhattan project. I have talked to people like Dr. Conant. I have talked with a number of other people, because that naturally was a question that was raised by quite a number of people. The Manhattan project started as an organization at the very beginning for the accomplishment of this particular objective. A different operation was decided on originally for the development of the missiles. When I came into this situation we were so far down the road in the development of these missiles that it seemed, not only to me but to others with whom I considered this matter, that we would be only slowing down the program by changing organization at that time.

And, as a matter of fact, I think that you have had a surprisingly successful development and research program on these missiles, considering the time that there has been for these organizations to take the job on.

Mr. BROOKS. So, your relevance is that, since it is an incomplete program, it would be better not to change the present setup in favor of a Manhattan project program?

Secretary MCELROY. That is my belief, sir.[2]

Mr. DEVEREUX. * * * Mr. Secretary, what will the relationship between Mr. Holaday and this new Advanced Research Projects Agency be?

Secretary MCELROY. Well, these men will have responsibilities which are practically in parallel. We think that the missile program is a very major assignment for any individual. We therefore have felt that we would like not to distract Mr. Holaday from those responsibilities by assigning other things to him.

Anybody that works on an anti-ICBM or antimissile missile or anybody who works on various satellite applications will of necessity be very much interested in using any knowledge that we have accumulated in rocketry.

So that this man who is head of the Advanced Reasearch Project Agency, who would have that responsibility, would certainly coordinate very closely with Mr. Holaday in what he did. They will both be assistants to the Secretary of Defense and we would

[1] Investigation of national-defense missiles, pursuant to H. Res. 67. Hearings before the House Armed Services Committee, 85th Cong., 2d sess., January 13, 1958. No. 71, pp. 3981, 3991.
[2] Ibid., p. 3994.

expect would be close in their working relationship. And I have developed this thinking with Mr. Holaday and I am quite sure that he believes that this can work and work very satisfactorily.

Mr. DEVEREUX. Now, this Advanced Research Projects Agency and the establishment of that and the authority to enter into contracts with private business and all—does not that put the Department of Defense in the operational field, which was not the original concept of the Department of Defense?

Secretary MCELROY. It does put it into the field of operations, to the extent of research and development on advanced weapons systems.

Mr. DEVEREUX. Well, now, the using service will have a certain requirement, If they have a certain requirement of that nature, will they then go to this Advanced Research Projects Agency and ask them to go into a study of it and the development?

Secretary MCELROY. Well, if there is a clearly assignable individual service connection here, in other words, if this is clearly something which is within the mission of one service or another, we would normally not expect to assign this development program to the Advanced Research Projects Agency. We would give it to the individual service for it to develop.

Mr. DEVEREUX. Well, then, it is in the nebulous area that you will give some project to this Agency.

Secretary MCELROY. It is where it is not clearly evident which service should deploy that particular weapons system.

Mr. DEVEREUX. You are not fearful that this Agency being on the level of the Department of Defense may eventually usurp the responsibilities and the prerogatives of the various services?

Secretary MCELROY. I don't think so. And the reason I don't is that the desire and intent of this Advanced Research Projects Agency should always be to work itself out of a job, so that it can pick up the new things.

Mr. DEVEREUX. That will be new.

Secretary MCELROY. Yes, it will.

Mr. DEVEREUX. In the executive department.

Secretary MCELROY. Yes, it certainly will. [Laughter.] But it still makes sense, that it should bring something to a point where it is clearly apparent that it will be deployable in the not-too-distant future. And that point, it should prepare to divest itself of all future responsibility over a phased period. And that responsibility should then be placed upon the deploying service.

Mr. DEVEREUX. I am glad that that is recognized by the present Secretary of Defense, because as I said before originally the concept of the Department of Defense was not to go into operations.

Secretary MCELROY. I know that. I am sure.[5]

Mr. GAVIN. * * * Evidently you are going to have a Director of Missiles and then you are going to have a Director for Advanced Research Projects, with two individuals heading them up.

What I am interested in is to ascertain whether or not you, as the Secretary of the Department, are going to permit these gentlemen to direct these operations and projects without interference

[5] Ibid., pp. 4021–4022.

by other branches of defense. In other words, supposing the Director of Missiles comes up with some particular conclusion on some particular project that the other is working on. Then, I presume, you would turn it over to the Joint Chiefs of Staff, where there is a lot of feeling over a long period of years as to what should and shouldn't be done and what branch of the service should handle that particular project. The first thing you know, we are in a difficult situation.

What I am trying to determine is this: Whether or not, when you establish these new agencies, you are going to give unqualified authority to those people to proceed without interference from any of the rivalries that might exist amongst the Joint Chiefs of Staff or the various echelons of the Department of Defense, and then have it get into a difficult position where we lose time.

Now, the point I am trying to find out: In this organization that you are going to set up, can you give us any idea how you figure it is going to operate, or just who is going to be in authority in the particular agencies?

Secretary McELROY. Well, Mr. Gavin, I think you would like me, perhaps, to answer, first of all, whether I am clear in my mind as to how this reorganization is to take form. I am not at all clear in that; I am clear about the two Agencies that you talked about, because they are in existence. As to what we will recommend to the President as an improved type of organization of the Defense Department, there is going to have to be quite a fair amount of work done and a lot of fairly well-qualified people consulted before a point of view can be reached, which I can then endorse to the President. So I would rather not second-guess that one. It would be premature for me to say.

As for the Advanced Research Projects Agency, of course, any agency has to work within whatever the particular frame of reference of its authority may be. Within the frame of reference of that particular Agency, it has full authority to proceed. Now, the point about the Joint Chiefs of Staff participation in some of these decisions is not so much that they must be in, but that we want them in, because they are our military advisers.[4]

Mr. ROBERT W. SMART (chief counsel). In the first place, as the chairman has already stated to the members, Secretary McElroy proposes to establish the Advanced Research Projects Agency which would have initial authority over the satellite program, the antimissile program, and outer space programs, leaving the other missile programs where they presently are, within the military services.

The Secretary advised the committee in his opening statement and in his subsequent testimony that he proposes that this be an operational agency, that it will have the authority to contract.

It may contract with the military services. It may contract with other agencies of the Government. It may contract with universities who may be doing research and development, and many are today doing so. And, in addition, it may perform such work in its own facilities. So that the first question I would like to ask, Mr.

[4] Ibid., p. 4047.

Secretary, is this: Are you aware of any previous occasion since the Department of Defense was created when an operational agency was created within the Department of Defense, and outside of the military services?

Secretary McElroy. I am not aware of any, Mr. Smart; no. I think this is at least to the degree to which we plan to engage in an operating activity—this is the first example that I am familiar with.

Mr. Smart. Let me say at the outset, Mr. Secretary, that I am certain that this committee does not want to impede your serious efforts to get ahead in this missile field. But before missiles and after missiles, we were and must remain a government of laws and not a government of men. Therefore, I think whatever is done in this field must be done within the framework of existing law. And if it is necessary to do this or other actions of this kind which may not be authorized under existing law, then we must enact a law which would clearly make it legal.

You state, Mr. Secretary, that the Director will have the authority to arrange for the performance of work by other agencies of Government, including the military departments, to enter into contracts with private business or educational research institutions, or to perform the work directly with his own staff and facilities.

Now, let me refer members of the committee to the letter submitted by the President to the Speaker of the House, dated January 7, 1958, relating to the supplemental appropriation in support of this Agency as well as other matters of urgency. The bill is on the floor today.

Under Department of Defense, Office of the Secretary, is this heading: "Advanced Research Projects Agency, salary, and expenses. For expenses necessary for the Advanced Research Projects Agency, including acquisition and construction of such research, development, and test facilities and equipment, as may be authorized by the Secretary of Defense."

Mr. Secretary, I realize you are not a lawyer. You have a General Counsel to worry about these problems for you. But can you cite to this committee, sir, any existing authority in law for the Department of Defense, through this Agency, to acquire facilities and things of that kind in which the Agency could conduct its own research?

Secretary McElroy. Well, as you say, I am not a lawyer, but I agree with your initial statement, that this is a Government of laws and not of men. So when this concept of the improved management of certain of the research and development activities in the Defense Department came under our consideration, we naturally asked for a formal opinion from our General Counsel as to whether this was a matter which was within the authorization of the Secretary of Defense.

We have a clear statement that it is within the authority of the Secretary of Defense. I think, if you would like to go into the legal aspects of this, it would be wise for us to ask Mr. Dechert to come in here and discuss that for the committee.

I will be very glad to send for him, if you would like.

Mr. SMART. Since the committee will not meet this afternoon, Mr. Secretary, I think it is important that he be here before the the committee next convenes.

I think we ought to get together at 1 o'clock today or some such time.

Secretary MCELROY. He can come over here by a quarter of 11, if you would like.

Mr. SMART. Well, as soon as we adjourn. We will still be sitting here at a quarter to 11, sir, but my point is that I do not know whether there is any authority in law. So far as I know, there is no authority in law to acquire or construct research, development, and test facilities by the Department of Defense, as such, or any agency thereof outside of the military departments.

We have had a law which was to enable the departments to make contracts with defense industries to build defense plants at Government expense.

But that is an industrial facilities law. It has already gone into eclipse and there is now a bill before this committee to renew and extend that authority.

But that authority runs, so far as I know, only to the military departments, and not to the Department of Defense.

That brings us back: what other authority do agencies within the defense agencies have to operate?

Now, our situation at the moment is this. We have in this supplemental appropriation bill, language which in my judgment, in the absence of any other authority of law, will give them the authority to engage in this kind of construction. This is a point which has always been an extremely sore point with this committee and other legislative committees—legislation in an appropriation bill. And the urgency of the moment, with reference to this Agency, does not alter in any manner the character of that situation.

So I think the committee has to face this point: are we going to stand by and have the Appropriations Committee report a bill containing the sole authority at law to build these defense research and testing facilities, or is this committee, in the discharge of its legislative responsibility going to insist that this committee handle the legislation which would confer this authority?

Now, the appropriation—the supplemental appropriation bill is going to be on the floor of the House in extremely short order, today.

That points up, gentlemen of the committee, the urgency of this situation right here. Do you have any comments that you could give to that, Mr. Secretary?

Secretary MCELROY. The only other thing I could say is that this has been a matter of really quite considerable interest to me as it would be to any of you if you had my same responsibility. In addition to the opinion expressed and put in writing by the General Counsel of the Department, Mr. Dechert, whom we are sending for and who should be here by a quarter of 11, or some such time——

Mr. SMART. Fine.

Secretary MCELROY. I have also read an opinion which I am sure you are familiar with, Mr. Smart—probably more so than

I—which was written by Mr. Struve Hensel with a fairly historic interpretation I was told of the authority of the Secretary of Defense under the laws, the authorizing laws which have covered this subject of the original setting up and the subsequent reorganization bills effecting the Department of Defense.

Within the limitations of my understanding, and it is strictly a layman's understanding, the proposal as made here seems within the powers of the law as it is now written—within the powers of the Secretary of Defense under the laws as now written, but these are matters where I look to counsel rather than to try to answer myself and I would rather leave it to counsel to determine.

Certainly, we have no interest in going outside of the law, Mr. Smart, in doing what we are trying to do. It having been cleared once, that seemed enough for me to proceed.

Mr. SMART. Certainly, Mr. Secretary, I am not implying any willful evasion of the law.

Secretary MCELROY. No, I understand, sir.

Mr. SMART. But I would point out to you, sir, that this committee has been in existence now for 11 years. The National Security Act was enacted in 1947, the same year in which this committee was first organized.

And this is the first time in that 11-year period that the Department of Defense has ever proposed to go beyond policy, direction, guidance, and control, and enter into the operational field.

And while I would not attempt to say, sir, that you would propose to explore this same authority to its ultimate, I do point out that this is a precedent under which a great many additional things can go a great deal farther than this one agency if this precedent is established on the basis of existing law.

Secretary MCELROY. I wonder if I might make a statement here about the principles? I think I may have explored them to the satisfaction of the committee. But if you would like me to do so I will give you the principles under which we think it is an advisable thing to do, even though we recognize it as a departure.

There have been, I think, good and sufficient reasons up to this point for limiting the activity of the Department of Defense to those fields of policymaking and coordination which have been considered to be the proper functions of that Department up to this time.

There has developed, however, as you members of the committee have been able to observe over a longer period than I have been involved, a development of weapons systems which do not naturally fall within the responsibilities of individual services.

I would say the first one of those was the missile. When you have an Air Force, it is natural that airplanes that are to carry a responsibility other than that from a sea launch would fall within the responsibility of the Air Force and the development of aircraft therefore is not a matter of any real question.

Similarly, ground force equipment falls naturally within the responsibility of the Army.

And similarly, in the case of the other services.

Then you come along with the missile. There was question, and there still is in my opinion difference of judgment among lay-

men as well as among military authorities as to who should have the responsibility for a particular type of missile development assignment.

I think you get even further afield when you get into such things as outer space.

Someone in the committee here asked the question about ———, a ——— that might be used. It is not known really whether that is feasible. It is not known whether it would be used primarily on land, on sea, or how. It is because of our belief that this advance in technology will carry us in directions we know not where that it seemed to us in the Department of Defense to be very desirable in the interest of the national security to establish a research and development agency which would pick up those projects which do not have an obvious individual service connection. This agency would make the initial evaluation of the earliest indication of possible attainability of a weapons system with this new knowledge, follow through to the next stage in research or development if it is at the stage of initial development, and so on through to the point where you say, "All right, we now see a weapons system coming over the horizon." At that point we would designate a service as the deploying service, invite that service in, complete the development, and as we get then to the point of production the whole project is turned over to the deploying service for procurement, for future development, and for the actual use of the weapons system.

It seems to us to make sense, for two reasons: With these very novel systems, it seems to us almost impossible to designate the deploying service, a using service, before you know more about how the weapons system is going to develop; and second, we think this could be even more dangerous to the country, that if we depend on one service or another to look at some of this very advanced technology and decide that its responsibility to pick up this at a very early stage and develop and chase it down to whatever ultimate system may come out of this, or not to pick it up, some of these important projects drop in the spaces between the services, and not pick them up at all until it is late in the game.

Those are the principles, members of the committee, under which we have concluded that it not only is good management but it is in the national security interest to organize an operating agency for research and development only in the Office of the Secretary of Defense.

* * * * * * *

Mr. SMART. Now, Mr. Secretary, do you propose to take away from the Air Force its development of the Wizard and to take away from the Army its development of the Nike-Zeus and put the entire cognizance of both missiles under your Advanced Research Projects Agency?

What is the proposal in this regard?

Secretary MCELROY. The proposal in this regard would be that the responsibility for developing a system of defense against missiles, either of the IRBM type or the ICBM type, would be placed under this Advanced Research Projects Agency.

It would be assumed that the man who would be responsible for this would surround himself with very competent technical advice.

He would then, I would assume, reach a conclusion as to how he felt it desirable to proceed, to either contract with the Army to continue the way it is—and, of course, we have told the Army and told the Air Force that we want them to go right ahead with their developmental work——

(Mr. Smart nods.)

Secretary McElroy. Without respect to this new Agency, so there will be no interruption to development work that is going on.

I would think that he will from the best technical advice he can get from the best scientists in the country determine how we could best approach this problem and then continue with the Army if that is considered a sound technical approach, and also, if it is desired to have a second approach, perhaps continue with the Air Force on certain aspects.

As a matter of fact, we are considering making certain decisions of that kind even before the establishment of the Advanced Research Projects Agency because we aren't holding everything up waiting for this thing to take form.

Mr. Smart. * * * Mr. Dechert, questions have been raised here as to legal authority—two questions of legal authority relating to the Advanced Research Projects Agency. The first is as to the legal authority for constituting the Advanced Research Projects Agency on an operational basis within the Department of Defense and outside of the military departments.

Question 2: What authority is there in the law, in existing law, for the construction of facilities—research and development and test facilities—for this Agency, other than that which is contained in the submittal for the supplemental appropriation act?

Mr. Dechert. Mr. Chairman and members of the committee, the basic answer to this question comes in the National Security Act of 1947, as amended.

You gentlemen, of course, are vastly more familiar than I with the history of this act, and with the reasons which lay behind it. But anyone reading that act can see that it was intended from that point on that there be a Secretary of Defense who would run the affairs of the country with respect to the management of the entire defense organization, subject only to such restrictions as were placed in that act upon his management.

This was amply brought out in the history of the act and in subsequent discussions, of which I will read a bit in a minute.

But, as I said, it seems perfectly clear that this was intended as a matter of deliberate policy, to create a person who would be able himself to see that this business of the country, its most vital business for survival, was run.

In order to do that, he has to have the power to run it. He can't merely be an umpire or a referee. And there is no indication, in my judgment, in the act that he was intended merely to have that status. He was intended to be the person who would run it.

The question which was asked me implies that there were restrictions placed upon him in the act which forbade him to operate.

I see no evidence whatsoever of any such restrictions. The only evidence of that kind is in connection with the prohibition against his transferring combatant functions without the approval of the Congress itself. There is further prohibition against making substantial transfers of noncombatant functions within the Department of Defense in any way without reporting to this committee. The latter requirement is for a report, but this is not a prohibition or positive limitation upon his power to act.

The implication that he can't, himself, make any contract, that he can't buy pencils, he can't buy ink, he can't hire anybody, he can't go out and make contracts for some such new project, whether for a few dollars or a million dollars, if appropriate, is, in my opinion, not in any sense justified by the language of the act or the legislative history itself.

First, as to the history of the act. When we come to the National Security Act, the very words which deal with this are in section 202 (b). There are only two sentences. The first sentence reads:

"The Secretary of Defense shall be the principal assistant to the President in all matters relating to the Department of Defense."

The second sentence says:

"Under the direction of the President and subject to the provisions of this Act, he shall have direction, authority, and control over the Department of Defense."

You gentlemen will remember that at one time there was the word "general" in there—"he shall have general direction, authority, and control over the Department of Defense."

Conceivably, from the use of the word "general" there might have been an implication that he shall not have specific power. I do not agree that that would have been a proper implication, but it is conceivable that there might have been such an implication. But the Congress removed the word "general" in 1949. So, by the very act of removing that word "general" they eliminated any possibility of such implication now.

So, we now find in this sentence that "under the direction of the President and subject to the provisions of this Act, he shall have direction, authority, and control over the Department of Defense."

I know no words that could be more all inclusive than the expression "direction, authority, and control." And the earlier provisions of this act, in establishing the Department of Defense, say that "There shall be within the Department of Defense the three departments represented by the military services, which shall be 'military departments in lieu of their prior status as executive departments.'"

Therefore, it is perfectly clear that these military departments have now been made part of the Department of Defense.

I have indicated that there is in this statute, immediately following the section which I read, the limitation with respect to combatant functions, in section 202 (c) (1), and I quote:

"Notwithstanding any other provision of this Act, the combatant function assigned to the military services by section 205 (e),

206 (b), 206 (c), and 208 (f) hereof, shall not be transferred, reassigned, abolished, or consolidated."

That is the specific limitation upon these very broad grants which were earlier given.

I say, parenthetically, that, this specific limitation is, in my judgment, not involved in the matter which is here under consideration. This present matter is not a combatant function in any sense, by very definition.

It is something that is exploratory; it is leading up to whatever it may lead up to; and the Secretary of Defense has plainly stated that when the operation of this new Agency reaches the point that it has something that can be utilized for combat purposes, his present intention, under the present law, is to see that it is transferred to one of the military departments. That is when it becomes a combatant function.

It may be a brandnew combatant function that has never, existed, and therefore, actually, it might not even be within that limitation. But, if we assume that it is an outgrowth of some present combatant function, then it would be within the limitation.

In any event, this matter of which we are talking is not within that limitation.

Therefore, the only limitation upon this matter is the provision requiring a report, and such a report is intended to be made as soon as the exact language of the directive is worked out. This is, as you know, still a matter of discussion within the Office of the Secretary of Defense, subject to further developments.

This is supplemented by the language of title 5, United States Code, section 22, which deals generally with departments within the Government. This states that the "head of each department is authorized to prescribe regulations not inconsistent with law for the government of his department, the conduct of its officers and clerks" and so on.

This provision recognizes that the departments, the executive branch of the Government, must operate, and in operating, subject only to such restrictions as the Congress may have placed upon their manner of operating, they must have the power to operate, or else they become, by definition, useless and ineffective.

The chairman of this committee has brought these matters out in discussions that took place in connection with 1949 changes in this act. The following statement was made by Chairman Vinson in the Congressional Record of August 2, 1949, on pages 10742 and 10743, which, I think, throws a very clear light on the meaning of this phrase which I read, the phrase that reads, "direction, authority, and control."

This extract is about a page, and, if I may, sir, I would like to read this because of its effect on this very question.

Mr. BROOKS. Proceed, sir.

Mr. DECHERT. This is Chairman Vinson speaking at that time:

"Then the legislation provides that within certain limitations which I will explain in just a minute, the Secretary of Defense 'shall have direction, authority, and control over the Department of Defense.'

"This provision had the approval of the House committee and was in the Senate bill as well. It is endorsed by the Hoover Commission, the Eberstadt task force, the Secretary of Defense, and President.

"This sentence giving the Secretary direction, authority, and control is the heart of this legislation."

Certain things omitted. Then it goes on:

"No longer can there be any doubt that this Congress wants the Secretary of Defense to run the Department of Defense. In order that there can no doubt as to what direction, authority, and control mean, I want to give you the definition of those words as contained in the third edition of Black's Law Dictionary.

"Direction" means "the act of governing, management, superintends."

"Authority" means "legal power; a right to command or act; the right and power of public office to require obedience to their orders lawfully issued in the scope of their public duties."

"Control" means "power or authority to manage, direct, superintend, restrict, regulate, direct, govern, administer, or oversee." "

Then carrying on with Chairman Vinson's language:

"So, under this law, the Secretary of Defense is to have clear-cut authority to run the Department of Defense."

There is one other similar statement that I would like to read, although there are a number of these. These words are in the full committee hearings on H. R. 5032, as to the conference report, on pages 3799 and 3800.

"Mr. JOHNSON. * * * Would this provision allow him to abolish or curtail either one of those, without any statutory authority?

"The CHAIRMAN. Yes, sir. This act allows him to transfer, reassign, abolish, or consolidated any activities. The only thing that we can do is to get a report and then if we don't agree with him we must take some action in the form of a resolution to prohibit it from actually happening."

Now, to relate this in one sentence, then, to the first question that was asked me.

I believe that this sweeping authority must carry with it the ability to make the Department of Defense and its business work.

I see in this a clear grant, therefore, of the right to do these things; you pick the best man in the country you can find and you tell him to carry forward, and you have to leave to his judgment, subject only to such restrictions as have been made by law, the question of the best manner of carrying forward, subject to the fact, further, that he reports certain matters to you, and if you don't agree you can come and ask him why he is doing it.

Now, the second question, as I recall, related to whether certain plants or other physical facilities could be built it there was no authorizatiton for them except in the appropriation act; Is that correct?

Mr. SMART. Yes, sir, that is correct.

Mr. DECHERT. These, I take it, are not the facilities which are specifically included under the supplemental appropriation, which was asked the other day? There is a proposal now pending for authorization for those facilities. But now you are talking, as I

gather, about the question of whether, if it seemed desirable in connection with space activities, the agency in charge of this could set up a shed or a factory in which these things could be carried on?

Secretary McElroy. Or a laboratory.

Mr. Smart. Well, let's read the language in the supplemental appropriation submitted. For the Advanced Research Projects Agency:

"For expenses necessary for the Advanced Research Projects Agency, including acquisition and construction of such research, development, and test facilities and equipment as may be authorized by the Secretary of Defense to remain available until expended, $10 million."

Mr. Dechert. The word "acquisition" was intended, as it indicates, to cover the acquiring of the ability to utilize these things by whatever means they were acquired.

They may be offered free of charge by a university. They may be offered for rent. They may be subject to the possibility of construction with this money itself as a brand new facility to be owned by the Government.

If the latter course is followed, of course, in my judgment, you would have to follow the pattern which relates to all military construction.

If you were going to build something new, then you would probably have to get an authorization bill, as we are now seeking to obtain in connection with the supplemental appropriation bill which is now before the House, in connection with which there is a specific statute proposed to cover the authorization to build the things for which money is provided in that appropriation bill.

If one limits the question merely to the right to buy a piece of property and build a brandnew plant, I say that that right is subject to all the restrictions which normally surround the purchase of erection of buildings for use of the Department of Defense.

But the word which was used in the question presented to me was "acquisition." I have indicated that is a very much broader word, and it might well be that through one of these other courses, gift, loan, or lease at $1 per year, this kind of thing could be acquired without further authorizing legislation.

I hope that answers the question.

Mr. Smart. Well, I am still in the ball park, but out in left field let's put it that way. Do you say that under this language in the supplemental appropriation request, that the use of the word "acquisition" will give the Secretary of Defense the authority to go out and acquire 100 acres of land upon which to build a plant, without specific authorization on the part of the Congress?

Mr. Dechert. No; I don't think so. But isn't that in the authorization bill which is now before you—isn't there a general language seeking that?

Perhaps I am wrong about that.

Mr. Smart. I think the authority conferred in the legislation authorizing industrial construction relates only to the military

departments. That bill has no relation to our military construction authorization bills.

Mr. DECHERT. Then we would have to get consent under another statute, I think.

Mr. SMART. This is the time to find out where we stand. Because I think we are faced with this situation: We must interpret this language now and let everybody understand where he is going, the extent of his legal authority and limitations. If the supplemental appropriation bill in its present form is passed without further word on the part of the Congress, the Comptroller General of the United States is going to say "This is your authority to do these things." And I don't think the appropriation bill should be as is intended to confer any such authority.

Mr. KILDAY. As I understand, Mr. Dechert, it is your opinion, legal opinion, that under title V and the National Security Act as amended, and the various provisions, that Congress having created a Cabinet position of Secretary of Defense and a Department of Defense, that then the Secretary of Defense has the powers that would adhere to the head of a department of our Government, except in those instances in which his power has been restricted or denied or prohibited?

Mr. DECHERT. That is right, sir.

Mr. KILDAY. I would assume that counsel could produce some very respectable authority for his opinion.

I am not willing to accept it with my idea of the history of this thing as it has gone on, and some other provisions, such as the one that the Departments of the Army, Navy, and Air Force shall be separately administered by their respective Secretaries, under the direction, authority, and control—but being very practical, Mr. Chairman, we have a new Secretary of Defense and everyone here has expressed themselves as being highly pleased with the manner in which he is getting started.

He has announced the establishment of the Advanced Research Projects Agency. The President, in his message on the state of the Union, referred to these weapons that belong to neither service and should be developed separately from any of them.

Being very practical, it is going to be done. I don't think we should handicap a new Secretary by doing anything to prevent it. Time is of the essence.

I think the practical thing for us to do is to get together with counsel of the Defense Department and members of the Subcommittee on Appropriations handling the supplemental bill, and that we agree on language to go into the appropriation bill—because time may not permit it being done any other way—which would specifically say the Secretary of Defense is hereby authorized to establish the Advanced Research Projects Agency, and that the same shall have authority to do what you feel you have to do and put the full authorization right into that appropriation bill as permanent law.

Then we avoid all the debate on the nature of the Department of Defense, the legal powers, the authorities, the limitations, and everything else, and we just simply, openly, and aboveboard, authorize this agency with all of the powers that the Secretary says he needs to operate it.

Now, why wouldn't that work?

Secretary McElroy. It sounds very constructive to me.

Mr. Brooks. Do you have an answer, sir, to that?

Mr. Dechert. If it were done that way, I would like to be very sure that the language wasn't such as to imply that it was necessary to be done that way.

* * * * * * *

Mr. Dechert. It seems to me, as I say, sir, if we are going to Have the Secretary of Defense function, he must have this scope which I believe he does have. I think it would be very helpful, as Mr. Kilday has indicated, to avoid a debate on this subject. But I wouldn't like in the course of avoiding it, to place the situation in such a position that other things that we wanted to do later couldn't be done without specific authorization.

Mr. Kilday. Well, on the other hand, we don't want to take the other position, either.

Mr. Dechert. I know. That is why I say the language would have to be carefully worked out.

Mr. Kilday. Just the granting of specific authority to the Secretary to do everything he has asked for, I should think, would satisfy everybody in the Department of Defense. If I get half of what I ask for, I am generally satisfied. If you get all of it, you ought to be highly pleased.

Mr. Hébert. Mr. Secretary, I just want to establish one thought of policy. I have listened to your counsel. Of course, you recognize and readily admit that counsel's legal opinion is merely an opinion.

Secretary McElroy. That is right.

Mr. Hébert. And is not binding upon what the law actually is. You are in agreement there?

Secretary McElroy. (Nods.)

Mr. Hébert. Now in connection with counsel's interpretation of the act and the history of it, I certainly can't share that opinion, and I was here when the act was written. At no time—and I don't think that Mr. Vinson's remarks on the floor of the House are in conflict with the intent of the Congress in the passage of the act, wherein direction, control and authority were powers granted to the Secretary of Defense. But nowhere in the act does it give the Secretary of Defense, as I read it, the authority to go out and create a new agency with all power of contractual obligations, such as acquistion of land, or any other type of contract of that nature.

Now, the thing that disturbs me is that every time—and the history will show that every time these matters are brought before this committee it is under the veil or cloak of an urgency. We then find that the camel has his nose under the tent, and when we wake up we find out that we have just thrown all our authority and control away. And I think that has been emphasized by the counsel in reply to Mr. Kilday, that he wants such language in there that he doesn't have to come back here and get specific authorization for certain matters which may come up in the future.

I recognize the urgency that confronts us, but I certainly, for one, am not going to give solace or consent to any loose language

which will further take away the authority of this particular committee and the Congress.

* * * * * * *

Mr. HARDY. Mr. Chairman, I want to comment along the same line that Mr. Hébert has just commented. The counsel has drawn a most strained and far-reaching opinion here and he wants to assume for the Secretary of Defense all of the authority of this committee.

Now, I sat with the committee that first considered the National Security Act. I was at that time on the Expenditures Committee, which handled the original act. And I must say that at no time during the period that I have been in Congress have I ever heard anybody draw such a strained interpretation as counsel put on this awhile ago.

Now, I am not going to sit here and let any broad opinion on the legislative history of the National Security Act go unchallenged. This is far-reaching and we ought not even to permit such an expression to stay in the record, because it attempts to take away from this committee and from the Congress the authority which it has and to arrogate to the Department or to the Secretary of Defense authority the Congress never intended.

That whole interpretation that has been put in there by counsel is far-fetched and far-reaching, and ought not to be permitted to stay in the record.

Mr. LANKFORD. * * * Mr. Secretary, as I gather, this Advanced Research Projects Agency is sort of a basic research agency; they would work with something until it looked as if it were going to develop into a weapons system. At that point, the project would be turned over to one of the military services.

Now, who makes the decision first as to whether this is going to turn into a weapons system; and secondly, which of the military services shall get it? Is that made by ARPA itself, the Joint Chiefs of Staff, or the two working together through the Secretary?

Secretary MCELROY. The decision as to whether it is a weapons system is something that would be determined by the agency with its scientific advisers, but working along, as you would assume, with the Joint Chiefs as it develops. The determination of the deploying agency would be made by the Secretary of Defense, and I would assume on the advice of the Joint Chiefs of Staff. Certainly, if I were the Secretary of Defense at the time, I would consult the Joint Chiefs as to their recommendation as to who would be most appropriately the deploying agency.[5]

On January 14, 1958 Mr. Vinson, chairman of the House Armed Services Committee, submitted the report to accompany H. R. 9739 to the House of Representatives, and on January 15 offered an amendment authorizing the Secretary of Defense to establish the Advanced Research Projects Agency. The amendment added section 7 to the bill:

"SEC. 7. The Secretary of Defense is hereby authorized to establish within the Department of Defense the Advanced Re-

[5] Ibid., pp. 4057, 4068–4069, 4073–4080.

search Projects Agency, hereafter referred to as the Agency. The Agency shall have a director, to be appointed by the Secretary of Defense, and such other employees as the Secretary of Defense shall from time to time authorize. It shall be the duty of the Agency to engage in advanced, basic, and applied research as well as the development of weapons systems for the military departments, and to engage in such research and development of weapons systems not under the immediate jurisdiction of any military department as the Secretary of Defense, after consultation with the Joint Chiefs of Staff, may assign to such Agency.

"Nothing in this provision of law shall preclude the Secretary of Defense from assigning to the military departments the duty of engaging in research and development of weapons systems necessary to fulfill the combatant functions assigned by law to such military departments.

"The Agency shall have authority to enter into contracts with persons, corporations, colleges, universities, institutes, Government agencies, and such other organizations as the Secretary of Defense may approve, for advanced basic or applied research, or development of, weapons systems, or to engage in such research or development within the agency by utilizing employees or consultants of the Agency.

"The Secretary of Defense shall assign the weapons systems developed by such Agency to such military department or departments for production and operational control as he may determine.

"Nothing contained in this provision of law shall be construed as repealing, limiting, abrogating or modifying the limitations on the powers and duties of the Department of Defense and the Secretary of Defense as are now contained in the National Security Act, as amended."

Mr. VINSON. Mr. Chairman, for the benefit of the committee, I desire to call their attention to what this amendment is all about and to say that in the State of the Union message the President made reference to this agency.

In a statement made before the Committee on the Armed Services a few days ago by the new Secretary of Defense, he said:

"I am establishing within the Department of Defense an Advanced Research Projects Agency, which will be responsible to the Secretary of Defense, for the unified direction and management of the antimissile missile programs and for outer space projects. I would expect to assign other special projects of this nature to this agency from time to time in the future.

"The Agency will not be expected to take over research and development of weapons systems which fall clearly within the mission of any one of the military departments. It is contemplated that programs assigned to the Agency will be developed in full coordination with the military departments to the point where they are approaching operational capability so that they may be phased into the operation of one or more of the military services with no loss of time or interruption of development and production. We propose to establish the new Agency promptly and appoint a highly qualified director. The Director will have

authority to arrange for the performance of work by other agencies of Government, including the military departments, to enter into contracts with private business or educational and research institutions, or to perform work directly with his own staff and facilities."

Of course, when the Secretary made that statement before the Armed Services Committee we immediately recognized the importance of the language and the purport of what he had in mind.

The appropriation bill is proposed to carry some $10 million dealing with this. The question was raised this morning in committee as to whether or not the Secretary has the authority to establish this agency, as Secretary of Defense, or whether it is an agency which the Congress should give him the authority to establish.

Another question that deeply concerned us was whether or not the Department of Defense can enter into any production contracts, Such contracts are now made by the Departments of the Army, Navy, and Air Force. I know of no specific language in the National Security Act which gives to the Department of Defense the right to enter into a production contract. In fact, it was the concept when the Security Act was written that that office would be nothing more than a policymaking organization. Therefore, in view of the importance of this matter, we have submitted the pending amendment. It might have to be modified in conference or it may have to be added to or subtracted from, but I, at least, want it in this bill before the appropriation bill comes up for consideration.

Mr. BROOKS of Louisiana. Mr. Chairman, will the gentleman yield?

Mr. VINSON. I yield to the gentleman from Louisiana.

Mr. BROOKS of Louisiana. By placing the amendment here, the Congress will be indicating that it does authorize the authority within the Department, but it does not accept the theory that the Defense Department has authority over all agencies that they wish to create. Is that not substantially the situation?

Mr. VINSON. We do not by this amendment establish. We merely permit him to be vested wtih the authority to establish. We prescribe the language in here. I think the gentleman is correct in his conclusion.

Mr. Chairman, this was left to our chief counsel, Mr. Smart, to develop during the hearings this morning. It was necessary for me to appear before the Rules Committee at 10:30 in order to get a rule; therefore I was not present during all of the hearing. But the gentleman from Texas [Mr. Kilday] and other Members were there, so I ask the committee to permit Mr. Kilday to address you on the validity, the soundness, and the wisdom of this amendment being offered at this point.

(Mr. Kilday asked and was given permission to revise and extend his remarks.)

Mr. KILDAY. Mr. Chairman, I move to strike out the last word.

Mr. Chairman, there can be no doubt but that at the present time we are in a condition of emergency with reference to matters existing in the Department of Defense. This is not our first emergency. We have had recurring emergencies, and I

think, to be more correct about it, we would have to say that this has not yet been called an emergency but more an urgency; that there is a condition or a situation of urgency.

I believe it has been true always, and I am sure since I have been here, that in a situation of this kind the executive departments attempt to secure the broadest of powers and to get from under any type of control that Congress has customarily exercised. The gentleman from Illinois [Mr. Arends], in his remarks here today, pointed out that he wanted to see to it that the military got everything that they needed but that we should not, because there may be some symptoms of hysteria in the country, give them those things which are not needed.

I would like to point out the portion of this bill that has been stricken. As you realize, the committee struck out all after the enacting clause and inserted its own language. You will see that the Department, as it sent this bill up here, asked to be released from practically all congressional control at this early stage. The bill as drafted would have permitted the Secretary of the Air Force to establish bases where he pleased so long as it came within the money limitation and the categories mentioned. He could have established such installations anywhere he pleased and in any number he pleased as long as he stayed within $29,670,000 for SAGE; ballistic missile detection system, $189 million; alert facilities for Strategic Air Command forces, $24.6 million; ballistic missiles, $112.4 million; the dispersal of Strategic Air Command forces, $194 million.

The committee has seen fit to strike out that language and to proceed as we have since the termination of World War II to authorize these matters by line item except where security prevents that being done, and that is what we have done here. I believe I can say that the Committee on Armed Services intends to remain vigilant on matters of this kind.

In his message on the state of the Union, the President referred to the fact that there are new weapons coming into the picture which actually belong to none of the services, because they are totally new in concept and do not come within the roles or missions of any of the services. The Secretary of Defense has told us that he proposes to establish within the Department of Defense an Advanced Research Projects Agency and to commit to it those things which our chairman read you from his statement before the committee today. That would include, perhaps, under the broad language that the Secretary was speaking of, the power to enter into production contracts by the Secretary of Defense, something that has not been permitted since the establishment of the Department of Defense. As has always been done, all the appropriations have run to the Secretaries of the military departments. The general counsel of the Department of Defense takes the position that Congress, having established the Department of Defense, has endowed the Secretary of Defense with power to operate his Department as he sees fit except in those instances in which we have denied him certain powers. I know of no member of our committee who agrees with the general counsel in his construction of either the National Security Act of 1947 as amended in 1949 or in his construction of title V of the United States Code.

Now, the President has stated that this research should be done at a level other than the individual services. We have a new Secretary of Defense who has very favorably impressed your Committee on Armed Services in his appearances before us now for 2 full days and half of today. His first attempt to accelerate research and development of missiles and antimissile missiles and the new weapons that might be coming into the picture is by creating the Advanced Research Projects Agency.

I am sure that the Congress does not want in any way to impede the new Secretary of Defense. I am sure we all want to give him what he feels he needs in order to take this first step in bettering research and development on missiles and new weapons of all types. The language that we have brought here makes it clear, without stopping to debate what is the proper legal construction of the National Security Act or the amendments of 1949 or title 5 of the United States Code, that we give him the power to do everything that he said he proposed to do with reference to his Advanced Research Projects Agency, and we give it to him by positive provision of law, so that there will be no impediment to Mr. McElroy in his new office as Secretary of Defense in securing basic and applied research and development of any type of missile that he decides should be committed to that new organization within the Department of Defense.

So that the Secretary may proceed as he thinks best to give us the greatest guaranty of success in the great undertaking for which he has now assumed responsibility. I believe that we are here giving him everything that he proposes to do by his directive, except that we are doing it in the legal, proper, orderly fashion, by statute.

Mr. GROSS. Mr. Chairman, will the gentleman yield?

Mr. KILDAY. I yield to the gentleman from Iowa.

Mr. GROSS. As I understand this amendment—and I do not believe there are printed copies of the amendment available, is that correct?

Mr. KILDAY. There may be a carbon copy or two.

Mr. GROSS. Did the committee give consideration to the amendment; did it hold hearings on it?

Mr. KILDAY. As the chairman explained, Secretary McElroy was before the committee this morning, as he was all day yesterday and all day on Monday and testified in very considerable detail in his opening statement on Monday and again this morning with reference to the Advanced Research Projects Agency. The General Counsel of the Department of Defense was present and testified in some detail as to his construction of the National Security Act. This amendment was not reported by the committee. This amendment is offered on the responsibility of the gentleman from Georgia [Mr. Vinson], who is chairman of the committee. But it was not offered by direction of the committee.

Mr. GROSS. Mr. Chairman, if the gentleman will yield further, I appreciate the gentleman's explanation and that is exactly what I wanted to get at. This is an amendment offered on the floor of the House which would create another agency of Government; is that not correct?

Mr. KILDAY. It creates an agency within the Department of Defense.

Mr. VINSON. It authorizes it, it does not create it.

Mr. KILDAY. That is true, is authorizes the Secretary of Defense to create an agency.

Mr. GROSS. I do not think there is any question, if the amendment is voted into this bill today, and if the bill is approved by the House and by the other body, that there will be another agency with a director, in the Department of Defense?

Mr. KILDAY. That is correct. And the question is whether we shall do it by law, in the legal and proper manner or not, because it is going to be done anyway. And we take the position, and take it very positively and very firmly, that these matters are going to have to be submitted here. If he can create this Agency without statutory authority, then he can create a hundred more. But if we approve this by statutory authority, we have not recognized his right to create another single one.

Mr. GROSS. Since the gentleman is assuming the responsibility for it here and now, I wonder if the gentleman could tell me how much more this is going to increase the personnel in Government and what the added cost is going to be?

Mr. VINSON. Ten million dollars.

Mr. KILDAY. There is a bill pending in the Committee on Appropriations which I understand we will have up probably next Tuesday. This bill is authorizing legislation for some of those projects. The chairman of that subcommittee is present.

Mr. MAHON. If the gentleman will yield, last month the Secretary of Defense said that he could dispose of some of the controversy and jealousy in the Department of Defense and move faster with the advanced weapons program and get more for the taxpayers' dollar if he could lift out of the services certain advanced work and let it all be headed up in one unified program. He called this the Advanced Research Projects Agency. He has asked for the right to transfer available funds now in the hands of the services to that program, for example in the military satellite program and in the anti-ICBM program, and so forth. He is proposing to transfer presently available funds in the hands of the Air Force, the Navy, and the Army to this Agency, where he thinks he can get more progress, more for the money, and less duplication. That is the picture as it has been presented to us. I would not want to deny this new Secretary of Defense, who apparently is a man of real stature, on this effort to bring more order into certain military fields.

Mr. KILDAY. If the gentleman will permit, I should like to answer the other portion of the question of the gentleman from Iowa as to how many more employees this is going to create, and that sort of thing. This in and of itself will not increase it by one man. In the present attitude existing in the United States, I think it would be self-evident that there is going to be a great acceleration in research and development of missiles of all types and of all things having to do with outer space, so that there are going to be employed scientists of every character to engage in research and development. They are going to be employed some-

place, either in the military services or in the Department of Defense. Under this provision they will be employed in the central agency within the Department of Defense, so that their services will be available to all of the military departments. But of itself it will not increase the number of employees.[9]

On January 15 the House passed H. R. 9739 with ARPA added as an amendment and on January 16 the bill was introduced in the Senate and referred to the Committee on Armed Services.

On January 21 and 24, hearings were held by the Subcommittee on Military Construction of the Senate Armed Services Committee. Secretary McElroy sent a letter to the chairman, Hon. John Stennis, on the Advanced Research Projects Agency as well as a memorandum from the General Counsel on the legal authority of the Secretary of Defense to establish such an agency.

THE SECRETARY OF DEFENSE,
Washington, D. C.

Hon. JOHN STENNIS,
Chairman, Subcommittee on Military Construction,
Senate Armed Services Committee.

DEAR SENATOR STENNIS: I write this letter in compliance with your request for comment on section 7 of H. R. 9739, which concerns the establishment of the Advnaced Research Projects Agency.

After considerable study, I came to the conclusion that it would be highly desirable to have within the Department of Defense an Advanced Research Projects Agency which would be responsible under the Secretary of Defense for the unified direction and management of the research and development of certain advanced projects, including the antimissile missile program and outer-space projects. I would expect to assign other advanced projects to this agency from time to time in the future.

The Agency would not be expected to take over the research and development of weapons systems which fall clearly within the mission of any one of the military departments. In this connection there is contained in the 1959 budget a specific request for the funds to be appropriated for the Agency to cover the costs of the program to be assigned.

It is contemplated that programs assigned to the Agency will be developed in close coordination with the military departments to the point where they are approaching operational capability so that they may be phased into the operation of one or more of the military services with no loss of time or interruption of development and production. The Director will have authority to arrange for the performance of work by other agencies of the Government, including the military departments, to enter into contracts with private business or educational and research institutions, or to perform work directly with his own staff and facilities.

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[9] Daily Congressional Record, January 15, 1958, pp. 411-413

I have been advised by our General Counsel that there is adequate authority under existing law to have these functions performed under the Secretary of Defense in the matter which I have described above. Enclosed herewith is a copy of his opinion.

In accordance with your request, I am also enclosing herewith certain minimum changes designed to clarify section 7.

Sincerely yours,

NEIL MCELROY.

GENERAL COUNCIL OF THE DEPARTMENT OF DEFENSE

WASHINGTON 25, D. C.

Memorandum for the Secretary of Defense.

Subject: Legal authority of the Secretary of Defense to establish the Department of Defense Advanced Research Projects Agency.

This opinion deals with the authority of the Secretary of Defense to establish under him, for the purposes indicated below, an Agency which, under a director to be appointed by him, would be known as the Department of Defense Advanced Research Projects Agency, the general scope of which is indicated in the following:

"The Agency shall direct and manage such advanced projects in the field of research and development as the Secretary of Defense shall from time to time designate, by individual projects or by category.

"The Agency is authorized to direct research and development work in fields as assigned and to arrange for the performance of work by other agencies of Government including the military departments. The Agency must also enter into contracts with private business entities or educational or research institutions, within the limits of assigned funds when appropriate, and may establish laboratory facilities upon recommendation by the Director and approval by the Secretary of Defense * * *."

CONCLUSION

It is my opinion that the Secretary of Defense has, under existing statutes, authority to act in the manner indicated above. The "direction, authority, and control" over the entire Department of Defense given to him under section 202 (b) of the National Security Act of 1947, as amended, clearly includes the authority to transfer, reassign, abolish or consolidate functions in the research and development field. In addition, as head of an executive department, the Secretary of Defense under title 5, United States Code, section 22 has the authority to issue regulations relating to the distribution and performance of the Department's business. The proposed action does not contravene any of the statutory limitations of the power of the Secretary of Defense. The Secretary of Defense is authorized to perform these functions on his own behalf or by another officer or agency pursuant to section 202 (f) of the National Security Act of 1947, as amended, and section 5 of the Reorganization Plan No. 6 of 1951. This

opinion is in accord with the opinion of the counsel to the Committee on Department of Defense Organization which was the basis for the committee's conclusion that it was unnecessary to strengthen the authority of the Secretary of Defense. This rationale was carried through in Reorganization Plan No. 6 of 1953.[4]

Following extensive questioning by the committee members of the General Counsel of the Office of the Secretary of Defense, Robert Dechert, it was decided to delete from H. R. 9739 the section which dealt with the Advanced Research Projects Agency. The committee report of January 28 explained the action as follows:

> The bill as it passed the House contained section 7, authorizing the Secretary of Defense to establish an Advanced Research Projects Agency. This section was added by floor amendment to H. R. 9739. If the committee interprets the record correctly, it was added to the construction bill because the Secretary of Defense had announced his intention of establishing this Agency and some doubt prevails as to whether he has the authority to do so under existing law.
>
> The committee took detailed testimony on the subject and was advised by the Office of the Secretary of Defense that "the Agency shall direct and manage such advanced projects in the field of research and development as the Secretary of Defense shall from time to time designate, by individual projects or by category.
>
> "The Agency is authorized to direct research and development work in fields as assigned and to arrange for the performance of work by other agencies of government including the military departments. The Agency must also enter into contracts with private business entities or educational or research institutions, within the limits of assigned funds when appropriate, and may establish laboratory facilities upon recommendation by the Director and approval by the Secretary of Defense."
>
> Without addressing itself to the question of whether the Secretary of Defense has the necessary authority to establish such an Agency, the committee deleted section 7 from H. R. 9739 because it is a matter of organization and is not considered germane to a construction bill. The subject itself covers the broad area of space programs, manned satellites, rocket propulsion, etc., not now assigned to the various services of the Department of Defense. It is the committee's firm conviction that while the Secretary of Defense should be given every possible legal assistance necessary to accomplish his assigned mission, the subject of organization within the Department of Defense should be dealt with in one package. If authority of this type is considered necessary, it should be included in a measure specifically designed to amend the National Security Act of 1947, as amended, and such legislation is not properly a part of a construction bill, the main purpose of which is to furnish authorization to construct facilities for the operating services.[5]

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[4] Fiscal year 1958 supplemental military construction authorization (Air Force). Hearings before the Subcommittee on Military Construction of the Senate Committee on Armed Services on H. R. 9739. 85th Cong., 2d sess., January 24, 1958, pp. 60–61.

[5] Report from the Senate Committee on Armed Services to accompany H. R. 9739. 85th Cong., 2d sess. January 28, 1958. Rept. No. 1231, pp. 10–11.

On January 30, 1958, the Senate passed H. R. 9739 and the bill went to conference.[9] Both the House and the Senate adopted the conference report on February 6,[10] and that portion which deals with the Advanced Research Projects Agency was explained in the statement of the managers on the part of the House:

> Section 7. The bill as it passed the House contained a section 7 which authorized the Secretary of Defense to establish within the Department of Defense the Advanced Research Projects Agency. The Senate version of the bill contains no reference whatsoever to the Advanced Research Projects Agency.
>
> It should be pointed out that the House committee had no knowledge of the intention of the Secretary of Defense to establish the Advanced Research Projects Agency until he appeared before the committee in connection with a defense investigation which the House committee has been carrying on but which does not relate directly to H. R. 9739. During Mr. McElroy's appearance before the committee, he presented a statement, a portion of which read as follows:
>
> "Such long-range programs as the antimissile missile and the military-satellite programs are in the research and exploratory development stages. They are important and must be pursued, but they must not distract us from the speedy development of our other missile systems. To handle them, I am establishing within the Department of Defense an Advanced Research Projects Agency, which will be responsible to the Secretary of Defense for the unified direction and management of the antimissile missile program and for outer-space projects. I would expect to assign other special projects of this nature to this Agency from time to time in the future."
>
> The statement went on to indicate in general terms the manner in which the Agency would function. The House committee expressed the doubt that the Secretary of Defense had authority for the establishment of this Agency. The House committee felt, however, that an agency such as that described by the Secretary could perform an important function and, therefore, the committee proceeded to write into the bill language which would grant specific authority to the Secretary of Defense to establish the Agency.
>
> The importance of providing such authority was rendered even more evident by the fact that the House version of the appropriations bill (H. R. 10146) provided for the granting of funds to this Agency on the apparent supposition that the House authorizing language would remain in the construction bill (H. R. 9739).
>
> The differences between the House and Senate versions were resolved through the insertion of language which would grant the authorities needed by the Secretary of Defense to perform the important research and development functions relating to antimissile missile, satellite, and outer-space projects without, however, and the committee wishes to render this entirely clear, establishing an agency within the Department of Defense or in the

[9] Daily Congressional Record, January 30, 1958, pp. 1147-1156.
[10] Daily Congressional Record, February 6, 1958, pp. 1601-1603; 1588.

Office of the Secretary of Defense. The language agreed upon at the conference is as follows:

"The Secretary of Defense or his designee is authorized to engage in such advanced projects essential to the Defense Department's responsibilities in the field of basic and applied research and development which pertain to weapons systems and military requirements as the Secretary of Defense may determine after consultation with the Joint Chiefs of Staff; and for a period of one year from the effective date of this Act, the Secretary of Defense or his designee is further authorized to engage in such advanced space projects as may be designated by the President.

"Nothing in this provision of law shall preclude the Secretary of Defense from assigning to the military departments the duty of engaging in research and development of weapons systems necessary to fulfill the combatant functions assigned by law to such military departments.

"The Secretary or his designee is authorized to perform assigned research and development projects: by contract with private business entities, educational or research institutions, or other agencies of the Government, through one or more of the military departments, or by utilizing employees and consultants of the Department of Defense.

"The Secretary of Defense shall assign any weapons systems developed to such military department or departments for production and operational control as he may determine."

In this connection, the conferees also felt that the position taken by the General Counsel of the Department of Defense that the Secretary of Defense had authority to establish the Advanced Research Projects Agency was subject to question, as were some of the collateral views which he expressed in this same general connection. It should be understood, of course, that, were it the desire of the Congress, such an agency could be created within the Department by enactment of appropriate legislation.

It is pointed out that the foregoing references to antimissile missile, satellite, and outer-space projects refer to, and are intended to be restricted to, weapons systems and military requirements generally considered essential to the overall mission of the Department of Defense. It is pointed out also that there is an exception to the requirement that the activities of the Secretary of Defense in this respect be restricted to weapons systems and military requirements, and that is that portion of the agreed language which reads as follows: "and for a period of one year from the effective date of this Act, the Secretary of Defense or his designee is further authorized to engage in such advanced space projects as may be designated by the President."

This added temporary authorization is included in order to insure that such projects as the Vanguard may continue uninterrupted for the time being."[11]

At the time Mr. Vinson called up the conference report in the House, he said with regard to Section 7 of H. R. 9739:

Now, it is clear from the reading of this section that the principle of the House language has been maintained. It is equally

[11] Conference report on H. R. 9739, Supplemental Military Construction Authorization Act. House of Representatives, 85th Cong., 2d sess. Rept. No. 1329, pp. 7–9.

clear that the language in section 7 does not create a statutory office. It merely gives the Secretary of Defense certain powers. If he wants to exercise these powers within the framework of an Advanced Research Projects Agency or any other agency, he has the administrative authority to do it, now that we, by law, have given him the authority to contract "with private business entities, educational or research institutions," and so forth.

His establishment of an agency would not increase his powers one bit. The powers are the picture, and an agency is merely the frame. In fact, the Secretary told me yesterday that he proposed to set up an agency, and I think this is an efficient way to get the job done.[12]

When Senator Stennis laid the conference report before the Senate on February 5, he pointed out that "the new language makes no mention of the Advanced Research Projects Agency." It authorizes the Secretary of Defense to engage in advanced projects, and Senator Stennis said "the conferees were also in complete agreement that this does not establish any new agency within the Department of Defense or in the Office of the Secretary of Defense.[13]

On February 6 when the Senate adopted the conference report, Senator Case of South Dakota said that—

* * * in the compromise language adopted by the conferees a basis was established under which the Secretary of Defense could proceed with the responsibilities he has within the Department for the development of missile systems and weapons systems, and, for a period of 1 year, to carry on such projects as might be assigned to him by the President of the United States for research in outer space.

The action which the Senate took earlier this afternoon in passing a joint resolution to create a special committee which would have jurisdiction over bills which either will be introduced in the Senate or will come over to the Senate from the House of Representatives, when they deal with matters of this sort, indicates, I think, the concurrence of the Senate in the spirit of the action of the conferees.

We have passed no permanent legislation dealing with space projects. We have, however, provided a method of operation under which the Secretary of Defense can meet his responsibilities, and he can go forward to meet whatever challenges present themselves in the mind of the President at this time.

Senator Knowland stated that—

None of us at this time can tell what the ultimate judgment of Congress may be or what legislation finally will be enacted and signed into law. As I understand, however, there is no question that at the present time the work will be carried on in the Department of Defense, so that there will not be a hiatus and a stoppage of work, development, and progress in this field.[14]

On the same day the Senate passed the conference report which authorized advanced research on outer space projects, February 6,

[12] Daily Congressional Record, February 6, 1958, p. 1602.
[13] Ibid., February 5, 1958, p. 1482.
[14] Daily Congressional Record, February 6, 1958, p. 1588.

Senate Resolution 256 was adopted and thereby established the Special Committee on Space and Astronautics to study and recommend permanent arrangements for the development of outer space.[15]

Public Law 85-325 (85th Cong., H. R. 9739) was approved on February 12, the language in the conference report becoming section 7 of the act. The Secretary of Defense was authorized to engage in advanced projects pertaining to weapons systems and military requirements, and for one year was further authorized to engage in nonmilitary advanced space projects as designated by the President.

Appropriations for ARPA

On January 7, 1958, President Eisenhower sent a communication to the Congress on proposed additional authority for the fiscal year 1958, for the Department of Defense, in the amount of $1,370 million. A letter was attached from the Director of the Bureau of the Budget in explanation of this budget request which included as one item the Advanced Research Projects Agency:

Executive Office of the President,
Bureau of the Budget,
Washington, D. C., January 7, 1958.

The President,
The White House.

Sir: I have the honor to submit herewith for your consideration proposed additional authority for the fiscal year 1958, for the Department of Defense, in the amount of $1,370,000,000. This additional authority consists of $1,260,000,000 in new appropriations and transfer authority in the amount of $110,000,000 for new purposes, as follows:

"Department of Defense

"Office of the Secretary of Defense

"emergency fund

"For an additional amount for 'Emergency fund', $100,000,000, to be derived by transfer from such appropriations available to the Department of Defense for obligation during the current fiscal year as the Secretary of Defense may designate.

"Advanced Research Projects Agency

"*salaries and expenses*

"*For expenses necessary for the Advanced Research Projects Agency, including acquisition and construction of such research, development, and test facilities, and equipment, as may be authorized by the Secretary of Defense, to remain available until expended, $10,000,000, to be derived by transfer from such appropriations available to the Department of Defense for the current fiscal year as may be designated by the Secretary of Defense: Provided, That such amounts as may be determined by the Secretary of Defense to have been made available for related programs*

[15] Ibid., pp. 1551-1553.

in other appropriations available to the Department of Defense during the current fiscal year, may be transferred to and merged with this appropriation to be available for the same purposes and time period: Provided further, That such amounts as may be determined by the Secretary of Defense may be transferred from this appropriation to any appropriation for military functions under the Department of Defense to be merged with and to be available for the same purposes and for the same time period as the appropriation to which transferred.

"DEPARTMENT OF THE NAVY

"SHIPBUILDING AND CONVERSION

"For an additional amount for 'Shipbuilding and conversion', $296,000,000, to remain available until expended.

"PROCUREMENT OF ORDNANCE AND AMMUNITION

"For an additional amount for 'Procurement of ordnance and ammunition', $31,800,000, to remain available until expended.

"RESEARCH AND DEVELOPMENT

"For an additional amount for 'Research and development', $22,200,000, to remain available until expended.

"DEPARTMENT OF THE AIR FORCE

"PROCUREMENT OTHER THAN AIRCRAFT

"For an additional amount for 'Procurement other than aircraft', $360,000,000, to remain available until expended.

"RESEARCH AND DEVELOPMENT

"For an additional amount for 'Research and development', $30,000,000, to remain available until expended.

"MILITARY CONSTRUCTION, AIR FORCE

"For an additional amount for 'Military construction, Air Force', *including such construction as may be authorized by law during the second session of the Eighty-fifth Congress, $520,000,*-000, to remain available until expended.

"GENERAL PROVISIONS

"SEC. —. *In order to more effectively administer the programs relating to advance research activities, the Secretary of Defense may authorize within the Office of the Secretary of Defense the creation of fifteen positions in the professional and scientific service in accordance with the provisions of Public Law 313, Eightieth Congress, as amended, and to place ten positions in grades 16, 17, or 18 of the General Schedule, in accordance with*

the procedures prescribed in the Classification Act of 1949, as amended. These positions shall be in addition to those now authorized by law.

"SEC. —. *Hereafter, any appropriation available to the agencies concerned for the pay and allowances of members of the uniformed services may be utilized for the payment of claims as authorized by Public Law 85-255, approved September 2, 1957.*"

The foregoing proposed supplemental appropriations are necessary to accelerate and expand programs for the construction of dispersal and alert facilities for the Strategic Air Command, for the development and procurement of long-range ballistic missiles, including construction of ballistic-missile sites and ballistic-missile submarines, for the establishment of a ballistic-missile-detection system, and for extension of the semiautomatic ground environment system for air defense.

Funds are also requested for the new Advanced Research Projects Agency, to be responsible under the Secretary of Defense for the research and development phases of advanced science programs, including satellites and other outer-space projects, the development of an anti-ballistic-missile missile system, and such other special projects as may be designated by the Secretary of Defense. Establishment of the Advanced Research Projects Agency will require authorization of an additional 15 professional and scientific positions and 10 other positions in grades 16, 17, or 18 of the General Schedule over and above those now authorized by law. Provision is also made for the payment of claims authorized by Public Law 85-255, approved September 2, 1957.

The $1,370,000,000 herein requested, consisting of $1,260,000,000 in new appropriations and transfer authority in the amount of $110,000,000, is the same as the amount proposed for later transmission included in the 1959 budget for the Department of Defense, plus $100,000,000.

I recommend that the foregoing proposed supplemental appropriations be transmitted to the Congress.[16]

Respectfully yours,

PERCIVAL BRUNDAGE,
Director of the Bureau of the Budget.

Hearings on the supplemental defense appropriations for 1958 were begun by the subcommittee of the House Committee on Appropriations on January 8, 1958. The first explanation to the Congress of the Advanced Research Projects Agency was made by Secretary of Defense McElroy:

> The $1,270 million total includes $10 million for the Advanced Research Projects Agency. This amount is proposed to be derived by transfer from such annual appropriations available to the Department as may be designated by the Secretary of Defense. We are also requesting authority for the Secretary of Defense to transfer unexpended balances in other appropriations

[16] Proposed additional authority for the Department of Defense. Communication from the President of the United States. House of Representatives, 85th Cong., 2d sess., January 7, 1958. Doc. No. 208.

which were previously made available for programs that will now be administered by this new Agency. The sums proposed for transfer are to merged with this appropriation, the $10 million, and are to be made available for the same purposes and time period. It is most important that authority be granted to transfer funds from this appropriation to any other Department of Defense appropriation, to permit this Agency to utilize the great facilities and skills which exist in the military departments.

Initially the new Agency will be given full responsibility for research and development of the antimissile missile and for other space projects. Other special projects of this kind which are not clearly the responsibility of a single military department or which may be more appropriately performed by this Agency will also be assigned to the Agency.

The Agency will not ordinarily take over research and development of weapons systems which fall clearly within the missions of any one of the military departments.

It is contemplated that programs assigned to the Agency will be developed in coordination with the military departments to the point of operational use so that they may be phased into the operation of one or more of the military services with a minimum loss of time or interruption of development and production, unless overriding considerations dictate otherwise.

We propose to establish the new Agency promptly and appoint a highly qualified Director. The Director will have authority to perform work directly with his own staff and facilities, to arrange for the performance of work by other agencies of the Government, including the military departments, and to enter into contracts with private business or educational and research institutions.

I think that I should interpolate here and say as you may have read, we are also asking for 15 positions that are in the classification of scientific and professional and 10 supergrade positions for this Advanced Research Projects Agency. I have failed to mention that in the written statement, so I want you to know that I did not do that deliberately. It was simply a matter of oversight and I want to correct that by the interpolation at this point.[17]

The interrogation by the members of the Subcommittee on Department of Defense Appropriations with regard to the Advanced Research Projects Agency elicited the following information:

Mr. SHEPPARD. With reference to page 4 of your statement, Mr. Secretary, I find that the new Agency which is proposed to operate in what I interpret here as directional procedure for this entire program is to be known as the Advanced Research Project Agency; is that correct?

Secretary MCELROY. Yes, sir.

Mr. SHEPPARD. I notice in the second paragraph, "We are also requesting authority for the Secretary of Defense to transfer unexpended balances in other appropriations which were previously made available for programs that will now be administered by this new agency. The sums proposed for transfer are to be

[17] Supplemental defense appropriations for 1958. Hearings before the Subcommittee of the Committee on Appropriations, House of Representatives, 85th Cong., 2d sess. January 8 and 15, 1958, pp. 7–8.

merged with this appropriation and are to be made available for the same purposes and time period."

I presume in that statement, "for the same purposes and time period," it is clearly indicated to this committee that there is to be no exception in this transferability, other than that referred to here in this language? Is that a correct interpretation from your presentation, or an improper interpretation?

Secretary McELROY. That is correct.

Mr. SHEPPARD. That is clearly understood, and it is not to go beyond that statement insofar as this limitation prevails?

Secretary McELROY. That is the intent. That is the request.

Mr. SHEPPARD. I further notice in the last paragraph on page 4 that you state as follows:

"Initially the new Agency will be given full responsibility for research and development of the antimissile missile and for outer-space projects."

If the Agency is to be limited to that field, why are we requesting the range of transferability of funds, which to me at the moment would indicate that the transferability goes beyond what the money was originally appropriated for because it covers other aspects of the guided-missile program as against what is described here?

Secretary McELROY. Our intention, Mr. Sheppard, is that those funds which have been authorized in the past for anti-missile-missile activit would be transferred from the service which had been authorized to use those for that purpose to this new Agency. It would not be intended to do anything more than that in the anti-missile-missile field without some further discussion, if we feel it necessary. Similarly on these outer-space projects.

Mr. McNEIL. This authority for the transfer of funds presently available would be good until June 30, 1958, just for this current year.

Mr. SHEPPARD. I see. That was not indicated in the statement, of course. That disarms me from any further investigation of that responsibility, as long as that limitation is there. I did not know that.

Mr. McNEIL. An example would be that there were about $118 million in the fiscal year 1958 service budgets for research on outer-space and antimissile programs. Some part of that may have been utilized. Let us say that half of it has not been utilized by the time this Agency is underway. Half of that then would be transferred, but the authority would not be needed after June 30, 1958, because the Agency would stand on its own feet after that.

Secretary McELROY. In the 1959 appropriation, Mr. Sheppard, there will be a request that specific funds be appropriated for this Agency.

Mr. SHEPPARD. I notice reflected on page 5 in what appears there as the third paragraph the following:

"We propose to establish the new Agency promptly and appoint a highly qualified Director. The Director will have authority to perform work directly with his own staff and facilities, to

arrange for the performance of work by other agencies of the Government, including the military departments, and to enter into contracts with private business or educational and research institutions."

The verbal statement, not included in the regular statement, indicated that you require 15 new personnel in certain scientific-rating categories and 10 in what might be called normal ratings, as I interpret your statement.

Secretary McELROY. Called supergrades.

Mr. SHEPPARD. Those 15 and 10 total 25 new employees. Will this Agency be permitted to utilize these people who heretofore have been interested in this work and their ability is transferred to and added to the 25, or is it to be limited to just 25 and not the utilization of the members that you have from military forces and also in present civilian capacity within your own Department?

Secretary McELROY. I would expect that this man would make full use of the people in the various military departments who had been working in these fields before. The way in which that is organized, I would not want to detail at this point, because I would want the man himself to have some judgment as to how that would be done, but I think it would be a very big loss in these programs if we did not make use of everything that had been accomplished up to this time.

Our understanding with the services which have been working in these areas up to now is that there should be no slowdown in the work which is being done by them on their own in anticipation of any possible changes.

Mr. SHEPPARD. Mr. Secretary, there has been a lot of discussion in the press and considerable discussion on the part of the Members of both branches of the legislative branch of the Government relative to a rather radical revision of the operations of our military authority under certain guidance, one single service, and so forth. Generally it is premised upon the fact that there is too much rivalry and not enough definitive instructions issued or interpretations of instructions, and what not. In general, that seems to be what it represents, boiled down, as far as I am concerned.

My next question is directed to this particular point. You state here rather emphatically that this particular Director is to have the authority to accomplish a certain end within the limitations of what you have presented in your statement. Of course, the original authority is vested in you and may be made available only if you seek special legislation for more authority than presently exists under the law. It is slightly indicated in your statement that that may be in your mind.

Is it in your mind to come up to the Congress and ask for specific legislation which will not only set up this special Agency but will give them greater detailed authority than is transferable from your present legal position down to that other authority?

Secretary McELROY. I have been over this with the General Counsel of the Department of Defense. The concept that we have for the operation of the Agency, he tells me, does not require any special legislation, that it is within the power of the Secretary as it now exists.

Mr. SHEPPARD. Consequently, your answer as far as coming up and asking for special legislation for authority purposes is that such need is nonexistent?

Secretary MCELROY. We do not have it in mind.

Mr. SHEPPARD. Is it your present intention to give this man complete authority, subject to your own, of course, so when he issues his instructions to the respective branches of the military with which he is dealing, it will actually be authority, or will it be a suggestion of function? Which of the two?

Secretary MCELROY. Since he will have control of the money, it will be an authority. I think that is pretty basic in it all.

Mr. SHEPPARD. Just a moment, Mr. Secretary. I am sorry to take exception to you in this instance, but past experience would indicate to me that that is rather a subterfuge as against a man's clear authority. In other words, we can do much by the withholding of money. In fact, there is too much of that being done already. Do you not think the operation would be more effective if the gentleman's authority, which is subject to your grant, is final enough so that he does not have to utilize the prerogative of withholding funds for control purposes?

Secretary MCELROY. I agree with that, of course. I said what I said about the money because I have been told that the real power of control is the power of money. The plan is to authorize him to take whatever steps he needs to take in order to get this job done.

Mr. SHEPPARD. So there will be no misinterpretation on the part of the commands in the respective military positions as to what this man's authority is—period.

Secretary MCELROY. No, there will not.

Mr. MCNEIL. May I say I think the Secretary's reference to money was that if he has the appropriation as, for example, is requested in 1959 or as requested in this supplemental and places a work order, he has the authority to do the job.[18]

Mr. RILEY. Mr. Secretary, I want to pursue a little further the question raised by my distinguished colleague from California, Mr. Sheppard, in regard to the functions of this new Agency. Will that committee have the authority to carry out decisions directly, or will it have to go through several other committees before it gets to the research and development people?

Secretary MCELROY. The new Agency will take action directly. It can have whatever advice it wants to call for. It may have its own committees, but it takes action on its own.

Mr. RILEY. Is this an ultrasuperior committee that operates over the other committees, or does it carry out its own functions?

Secretary MCELROY. It carries out its own functions. It is responsible only to the Secretary of Defense. I believe this is the first time there has been built up in the Office of the Secretary, or as a compartment of the Office of Secretary of Defense, an actual operating agency.

Mr. RILEY. That is rather intriguing to me. It certainly rings a bell as far as I am concerned. For a long time I have felt that

[18] Ibid., pp. 16-19.

too many commissions and too many boards operate in the Pentagon and that slows the functions down. I am rather of the opinion if you had fewer people in the Pentagon you would get more action. I may be wrong about that.[19]

Mr. WIGGLESWORTH. How large do you contemplate the Advanced Research Projects Agency will be? It calls for certain new personnel here, and I suspect you will transfer considerable personnel from other sources, will you not?

Secretary MCELROY. Yes. In my own conception of it, this Advanced Research Projects Agency will use many of the operating parts of the Government as they now exist, but the exact evolution of that I think will take place over a period of time.

I would like this committee to think with me in terms of this being really a very promising part of the speeding up of important actions in the defense area. We did not do this lightly at all. We believe that the projects of the future, which perhaps none of us except the best dreamers of the future can visualize, will come to operational status much faster because of the directness of the action which can be taken by this Agency. The future will have to prove whether that is a hope or a promise, but we are really extremely hopeful that this can be of considerable significance in the years ahead.

Mr. WIGGLESWORTH. Mr. Sheppard spoke about the proposed language for the setup of this organization. It seems to me that the language "*Provided further*, That such amounts as may be determined by the Secretary of Defense may be transferred from this appropriation to any appropriation for military functions under the Department of Defense," is pretty sweeping. In other words, as I read the language, you could take the money made available for this new Agency and use it for any purpose in the discretion of the Secretary.

Secretary MCELROY. The language should be modified if it says that.

Mr. MCNEIL. It is intended, sir, that the unexpended portions of funds already appropriated for the antimissile missile and the outer space projects could be transferred to this Agency——

Mr. WIGGLESWORTH. I am talking about transfers the other way.

Mr. MCNEIL. Yes; I know. Then if either the Army, Navy, or Air Force was equipped to carry out certain projects, some part or some piece of each of these projects, certain funds could be transferred from this appropriation to the Army, Navy, or Air Force appropriations for this purpose.

Mr. WIGGLESWORTH. I think it ought to be tied down to those purposes.

Mr. MCNEIL. That was the intent.

Mr. SHEPPARD. The language says, "any other Department of Defense appropriations."

Mr. WIGGLESWORTH. To any appropriation for military functions.

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[19] Ibid., p. 89.

Mr. McNeil. It could be something in maintenance, although that is not likely to be a substantial sum, or it could be research and development, or procurement.

Secretary McElroy. I think we can improve this wording, and will.

Mr. McNeil. I can suggest language which will cover that point, because that is the intention.

Mr. McElroy. There is no intent to do other than what Mr. McNeil has said.[20]

Mr. Ford. The Advanced Research Projects Agency is to start operation with a $10 million transfer from various and sundry Department of Defense accounts?

Secretary McElroy. That is right.

Mr. Ford. Have you any idea from what identifiable sources today that $10 million will come?

Mr. McNeil. It would be intended that it would come from what appear to be unobligated sums in annual accounts. It would not be from procurement and production accounts. It could come from unobligated funds which will probably remain unobligated at June 30 in the Army. It could be from Army or Air Force. The language included in the supplemental means we could take it from any account, but it would be intended to take it from annual accounts.

Mr. Ford. In other words, 1-year rather than no-year funds.

Mr. McNeil. That is right.

Mr. Ford. Have you any idea how much in dollars you will transfer into the account in unexpended balances?

Mr. McNeil. The amount could not exceed $100 million, but by the time the Agency is established it might run in the neighborhood of $50 million.

Mr. Ford. Could you give us a concrete example of the kind of item which would be transferred to the Advanced Research Projects Agency in this category?

Mr. McNeil. In the Army, the antimissile missile program has allocated to it at the moment $38 million, of which $12.5 million is in research and development and $25.5 million from procurement and production. If this Agency were actually underway and ready to do business, let us say, March 1 or April 1, it is possible that one-fourth of that total or one-half of that total will still be unexpended. If that Agency is ready to do business, under this authority this could be transferred to that Agency to administer from that time on. It would not be contemplated that any contract outstanding which showed an obligation against Army or in a similar instance against Air Force would necessarily be canceled. An alternative might be that the Agency might direct the administration of a particular contract, but it could still stand as an obligation against Army or Air Force.

So this was merely to provide flexibility so the Agency could begin operation, and also if there were unutilized funds allocated, those sums would be transferred for the administration of the Agency.

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[20] Ibid., pp. 50-51.

Mr. FORD. You have asked for authority to transfer out funds, and there has been some discussion about the extent of this transferability. I do not quite see why you need any authority to transfer out as long as this Agency has the authority to make obligations or contracts. You can make them with individual constituent agencies of the Department, or you can make them outside of the Department, so why do you have to have authority to transfer from this Agency to X agency in the Army or Y in the Navy or Z in the Air Force?

Mr. MCNEIL. You could do that, sir, and the Agency could work without it. It sometimes saves considerable bookkeeping, and so forth, if you have a project, the estimated cost of which is a million dollars, and the funds are transferred and became a part of the Agency's own appropriation. It just saves this Agency setting up an accounting establishment to reimburse the service. You would transfer funds, in effect, at the beginning of the work instead of settling with them each month. It just facilitates bookkeeping and does not change the intent in any way.

Mr. SCRIVNER. In other words, you would transfer the money right along with the program.

Mr. MCNEIL. That is right.

Mr. FORD. I gather from your statement, Mr. Secretary, that at this point you are thinking primarily of the antimissile missile program and the outer space program as the responsibility of this particular new Agency.

Secretary MCELROY. For the immediate future, yes.

Mr. FORD. Am I correct in assuming that at the moment, both the Air Force and the Army are the two departments which are primarily concerned with those problems?

Secretary MCELROY. That is right.

Mr. FORD. When you were before us in November, we got some inkling of the prospect of this new Agency, which I thought was a very sound proposal. I was a little concerned shortly thereafter when I read that the Air Force at least initially—apparently they subsequently canceled it—set up something in this area. Was that done bearing in mind what this Agency had in mind doing?

Secretary MCELROY. That happened while I was in Europe. I think what was intended was that that should have been held, and if it was to be done—and maybe it was to be done because the Air Force will probably be the agent to handle certain of these outer-space experiments for this Research Projects Agency—it was felt that it should be done after the announcement was made of the actual setting up and the manning of this Agency.

So I think there was really a little failure to communicate within the Air Force rather than any intent to do anything that would be counter to the purposes of this Agency. This has been thoroughly discussed within the Department of Defense. While I would not say that there have not been some differences of opinion about it, I would say that in general it is accepted, and accepted as an action that should be taken.[21]

[21] Ibid., pp. 57–58.

Mr. OSTERTAG. In reference to the new Agency that is proposed in this budget request, Mr. Ford discussed this subject just a few moments ago and he raised a number of pertinent questions with regard to it. Perhaps everything that might be said about it has been said and answers have been given, but I would like to raise the question whether or not the Director, Mr. Secretary, will be directly and solely responsible to you as Secretary of Defense.

Secretary MCELROY. We plan to make him the Director, and responsible directly to the Secretary of Defense. I consider it that degree of importance, that he be close to the Secretary.

Mr. OSTERTAG. There are a number of studies, projects in the making at the present time in the field of antimissile missiles, or let us say outer space projects, including the satellite. Will these projects and the jurisdiction and control over them rest in the hands of this Agency at this point, once it is created?

Secretary MCELROY. They will. When you say "once it is created," the man may determine that he would like to take 30 days, or something of that sort, to get staffed and get ready, but it is intended as soon as the organization is prepared to take over, that these would be transferred for management, control and stimulation, to this advanced research projects agency.

Mr. OSTERTAG. You have an Assistant Secretary of Defense for Research and Development, and that part of your Defense Department has certain supervision or jurisdiction over research and development. What will be the status of this new agency as compared to your existing agency on research and development? In other words, will there be any conflict or duplication of jurisdiction?

Secretary MCELROY. We have done a good deal of talking about that and I think it is a very good question, Mr. Ostertag. The Assistant Secretary for Research and Engineering within the Department of Defense, we think, would not have any impingement on his responsibilities and prerogatives through the operation of this agency. This is an action agency to get a job done. The job of the Assistant Secretary for Research and Engineering, as it is now called in the Department of Defense, is a job which involves coordination of the research activities of the various branches of the armed services which he would continue to handle.

Of course, this man would work very closely with him in connection with that, and also in stimulation of the entire program in the three Services. We do not see that this would need to be or would be expected to be in conflict or in duplication or in impingement on the work of that Assistant Secretary, nor on any of the other departments.

Mr. OSTERTAG. Mr. Secretary, I can see where this is a splendid proposal, and I am confident this new agency will serve a very useful purpose, but in recent months, particularly since sputnik, there have been many ideas bantered around and considerable criticism as to what has or has not been done in connection with our military developments. The suggestion has been made that we should have a missile czar and we should have all sorts of coordination and direct authority to deal with these things with a strong hand, in order to get the thing done. The President has seen fit in his wisdom to appoint an assistant to the President

for science—I am referring to Dr. Killian. You have also your own missile director in Mr. Holaday. We have a Department of Research and Development, and now we will have an Advance Research Projects Agency, and probably you will hear that this is just more of the same.

Is that fair criticism? How are we going to be sure that this new agency is going to do what ought to be done and is not more of the same?

Secretary McElroy. I think it is the responsibility of the Secretary to see that that does not happen. With respect to Dr. Killian, I do think it ought to be understood, and I think there was a considerable amount of misunderstanding when the position was announced. I do not think the President ever had in mind that Dr. Killian was going to have any active connection with the Defense Department.

Mr. Ostertag. I do not think so either.

Secretary McElroy. We want him in our picture for advice, and he is welcome at any time, because he is a great man and a man whose position in the country is, I think, impeccable in this area, and any other, but I do not think there is really any conflict there within Defense. He has got so many things to do in all other areas of science as well as in defense that there really is no conflict offered there.

Mr. Ostertag. Actually this new Agency, Mr. Secretary, will have nothing to do with missiles as such, but with only those new advanced projects that have never seen the light of day?

Secretary McElroy. That is correct, except that some work has been done on these two areas that we are talking about.

Mr. Ostertag. They are just ideas, though.

Secretary McElroy. They have been in research and development, though, and a fair amount has been done on them, but what we are looking for is a quicker operational result, and that we think we may be able to obtain in this way and then looking further down the road, we think that this is the Agency on which we must rely to see to it that some highly speculative types of possible weapon system, which not very many people may even recognize as potentially useful for weapons, will be picked up, will be evaluated, will be given consideration and then either continued on an experimental basis or pitched; but at least we will not overlook it through simply not having some sort of a general agency for being responsible for having a look at it.

Mr. Ostertag. Is it fair to say that your new Advanced Research Projects Agency will do this: First, it will coordinate, pull together activities in this field of new advanced weapons—not advanced weapons, but research projects?

Secretary McElroy. First, two specific fields, that is all, and to get that job done. This is a couple of fields which really cut across the services. It is not clearly one service or another service.

Mr. Ostertag. In other words, it will eliminate possibly interservice conflict in this field?

Secretary McElroy. We certainly expect that that will be 1 of the results that we obtain on these 2 projects, the antimissile missile and the satellite project.

Mr. OSTERTAG. You will achieve that through the control of the funds?

Secretary MCELROY. Control of the funds and the control of the operation. The man has the authority and the responsibility

Mr. OSTERTAG. I yield.

Mr. FORD. In fiscal year 1959 will this Agency have its own budget presentation?

Secretary MCELROY. It will certainly have separate appropriation recommendation, and I assume that that will be discussed separately when the time comes, and I would certainly expect that by that time the Agency will be set up, and I would assume then as the third assumption that we would certainly discuss its program separately.[22]

Mr. MAHON. In this new Agency, the Advance Research Projects Agency, do you intend to undertake a lot of basic research which might not necessarily every be related to the problem of national defenses.

Secretary MCELROY. I would say that within the particular areas of their responsibility we will assign these areas specifically to elements of the Department of Defense as they themselves or we generate interest in a new type of weapons development. They will handle the basic research as well as the developmental research.

Mr. MAHON. But the basic research will be related to the objective.

Secretary MCELROY. Particular projects for which they have the responsibility.

Mr. MAHON. As you well know, there is a feeling in this country, and I think it is correct, that we need to do a lot more basic research than we are doing.

My question is this: Is it the overall thinking of the administration that we will do this basic research in the Defense Department area or will we do it in some other agency?

Secretary MCELROY. I think some of it may be done outside, Mr. Chairman, in a way that the NACA has done quite a lot of basic research in aeronautics.

If that is true in this area, let us say, of outer space—they call it astronautics—we then would work with any such agency of a civilian, nondefense type in the same way as we work with the NACA on their advance basic research work.

Mr. MAHON. It is perfectly clear to me that you do not expect in this new Agency to do that vast job of basic research which many people claim needs to be done in the overall fields.

Secretary MCELROY. My feeling about this question of whether the basic research is done in Defense or outside is that I am receptive to having outside agencies do quite a lot of this if they are well fitted to do so, and I know that a great deal of thinking is being done by Dr. Killian and advisers of his in this area.

The only part of research that I regard as consistently the responsibility of the Defense Department is anything having to do with the development of weapons.

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[22] Ibid., pp. 61-63.

Mr. MAHON. I am inclined to agree with you.

Secretary MCELROY. So far as I am concerned I do not believe anybody should be thinking of taking that outside of the Defense Department because it doesn't seem to me as if that would be in the interest of the country.

The basic research I can see very well might be handled outside, and we would be very glad to work with such an agency if it were doing that basic research.

Mr. MAHON. I have some doubt about this organization. As you know, we cannot by creating committees and new agencies and new organizations necessarily solve our problems.

Secretary MCELROY. That is right.

Mr. MAHON. You are just as aware of that as anyone else. I do not know about how effective this thing might be. I would like to explore it more as we go along.

Are you thoroughly sold on it as of this time?

Secretary MCELROY. I am thoroughly sold on it as of this time but I could keep asking questions about it as we go. I do not put my feet in concrete on these matters.

The way some of these projects have been going which do not have direct individual service association with more than one service pitching in to work out a solution of what is an admitted problem, I think that even the services themselves would say that a consolidation of that kind of development and research in one pair of hands, even though you may still decide to go 2 different routes to try to solve a really urgently pressing problem, is a better way of doing it than having the thing done by the 2 services.

Mr. MAHON. I feel very strongly that we need to improve and modify the present organizational setup, not only in this field and otherwise, but there is a question of how to do it. In the regular hearings I would like to explore that in detail.

Secretary MCELROY. This is not the whole job of that. This is simply a piece of it but a pretty important piece and one which seems very clear to me. With these highly modern weapons they have less and less of an obvious connection with an individual service.

Mr. MAHON. That is right.

Secretary MCELROY. For that reason you get into really the kind of competitive activity service to service which has some of the characteristics that are regarded as distasteful around the country.

While I do not concede this, they may even have some tendency to reduce the efficiency of what we do. I think that is debatable, but certainly the public has the impression that this is really not the way to run the railroad, and I am willing to respond with the public in that respect because I don't think it is, either.

Mr. FLOOD. Might I suggest this: That there be filed with you, Mr. Chairman, as soon as you have this Director and he has his clearance and turns the light on, that he will have at that minute, or within 30 days, X jurisdiction of certain projects from all the branches of the Armed Forces?

Secretary McELROY. When he is appointed we will issue a directive that we have been working on for 45 days.

Mr. FLOOD. All right. I would like you to file with this committee even the classified stuff giving us the complete original jurisdiction of this new baby because we will live with it. Give it to us item by item, project by project, the old ones, where you took them from. Give us that list and then day by day or week by week or month by month, as you take old ones in or give birth to new ones, give us a monthly report of them as you develop these things. We will then have on this committee step by step just what that man has.

Secretary McELROY. I would be very happy to report that as often as you gentlemen want it.

Mr. MAHON. Very well.

I am a little concerned about these super grades, and so forth, but I do not think now is the time to go into that with you.

Secretary McELROY. I cannot even be absolutely specific that that is exactly the number we need. We think we need at least that many and we would like to have them for the purpose of giving us authority to employ high-quality people at reasonably satisfactory salaries.

Mr. MAHON. Mr. McNeil, will you read that portion of the budget estimate which relates to the transfers to and from the agency?

Mr. McNEIL. The first part of the language provides for the transfer to this agency of $10 million. It may not require that much between now and June 30, but it will get it underway during this fiscal year. That $10 million will be derived by transfer.

In addition it is provided that such amounts as may be determined by the Secretary of Defense to have been available for related programs in other appropriations available to the Department of Defense during the current fiscal year may be transferred to and merged with this appropriation to be available for the same purposes and time period.

There is presently allocated to projects that would be initially undertaken by this agency a total of $118,442,000 for projects which initially will be taken over by this agency.

Mr. MAHON. You would not transfer money from aircraft and related procurement, construction of ships, and things of that kind, would you?

Mr. McNEIL. No funds except what was discussed with you people at the last hearings and allocated for these purposes—antimissile-missile programs and advance reconnaissance systems.

In other words, outer space work and antimissile missile.

The total of that at the beginning of the year, or for fiscal year 1958 as a whole, was $118,442,000.

Some part of that will have been allocated and obligated by the time this agency is established.

Mr. MAHON. If you continue to read that we find "*Provided, further*, That such amount as may be determined by the Secretary of Defense may be transferred from this appropriation to any appropriation for military functions under the Department of Defense to be merged with and to be available for the same pur-

poses and for the same time period as the appropriation to which transferred."

Mr. McNEIL. That language is added to make for a simpler operation. It is not to augment any program other than ones covered by this agency. It is a little simpler in administration if, as I think Mr. Scrivner mentioned earlier, a project having a value of $1 million, let us say, is to be accomplished by the Army. You would assign that segment of the project and $1 million to the Army. It makes for simpler administration if they can merge it with their research appropriation or their procurement appropriation to do the work. That is the only intention of that proviso.

Mr. MAHON. Will you, under this provision, possibly transfer the project from the Air Force to the Army, or from the Army to the Air Force, or the Navy to the Army?

Mr. McNEIL. No, sir; not as an objective. In starting this agency, what would be contemplated would be that the residual ammounts, or the unexpended portions of the antimissile program of the Air Force and of the Army, the total of which is $38 million for the Army and $29 million for the Air Force, could be transferred to this agency.

Also, there is presently allocated $47.5 million for outer-space work in the Air Force. The unexpended portion of that could be transferred to this agency. As a part of a consolidated program some of the work might be accomplished by the Air Force. It could be that some part of the work might be done by some other agency of Government. That would probably be a very small portion. Navy has presently allocated no funds for these purposes, but if some of their facilities could do a $500,000 job, it could be so assigned.[23]

Mr. CROSBY. We have language that should be discussed, specifically it is the proposed language for the Advanced Research Projects Agency and one of the general provisions.

Today, in connection with the authorization bill authorizing Air Force construction, there was an amendment on the floor of the House that in effect authorized the establishment of this new Agency. This authorization language probably will necessitate changing somewhat the appropriation language.

Mr. LANMAN. Prior to the submission of this budget request by the President together with the language which is included in the estimate, the Secretary of Defense consulted the General Counsel of the Department of Defense, who assured him he had the authority under existing provisions of the National Security Act to establish this Agency and to confer upon it the functions we seek the funds for.

We have here an approved opinion of the General Counsel of the Department of Defense on the subject of the Secretary's powers, which we would like to put in the record.

Mr. CROSBY. I think it would be well to also include the language that passed the House this afternoon.

Mr. MAHON. They will be included in the record at this point.

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[23] Ibid., pp. 70–73.

(The matter referred to is as follows:)

"ESTABLISHMENT OF AN ADVANCED RESEARCH PROJECTS AGENCY

"(1) Does the Secretary of Defense have legal authority to establish an agency for the direction and management of certain advanced research and development projects?

"Section 202 (f) of the National Security Act, provides as follows:

"'The Secretary of Defense may, without being relieved of his responsibility therefor, and unless prohibited by some specific provision of this act or other specific provision of law, perform any function vested in him through or with the aid of such officials or organizational entities of the Department of Defense as he may designate.'

"And in addition, section 5 of the Reorganization Plan No. 6, effective June 30, 1953 (67 Stat. 639), provides as follows:

"'Performance of functions: The Secretary of Defense may from time to time make such provisions as he shall deem appropriate authorizing the performance by any other officer, or by any agency or employee, of the Department of Defense of any function of the Secretary, including any function transferred to the Secretary by the provisons of this reorganization plan.'

"These statutory provisons contain ample authority for the establishment of such an agency.

"(2) Does the Secretary of Defense have legal authority to transfer functions to such an agency necessary to effectuate its purposes?

"Section 202 (c) (5) of the National Security Act provides as follows:

"'Subject to the provisions of paragraph (1) of this subsection no function which has been or is hereafter authorized by law to be performed by the Department of Defense shall be substantially transferred, reassigned, abolished, or consolidated until after a report in regard to all pertinent details shall have been made by the Secretary of Defense to the Committee on Armed Services of the Congress.'

"Since the Secretary of Defense has 'direction, authority, and control' over the Department of Defense he has the authority to transfer, reassign, abolish, or consolidate functions of the Department of Defense subject only to limitations not material here relating to combatant functions and the requirement for separate administration of the military departments, and subject only to the requirement for reporting to the Congress.

"(3) Does this newly created organization have to be completely self-contained or may it call on the military departments to perform administrative functions such as the preparation and signing of contracts, disbursement of funds, and other support activities?

"The answer is that there is ample authority and precedent for requiring the military departments to perform such administrative functions, with full control being retained in the agency."

"Add a new section as follows:

"'SEC. —. The Secretary of Defense is hereby authorized to establish within the Department of Defense the Advanced Research Projects Agency, hereafter referred to as the Agency. The Agency shall have a director, to be appointed by the Secretary of Defense, and such other employees as the Secretary of Defense shall from time to time authorize. It shall be the duty of the Agency to engage in advanced, basic, and applied research, as well as the development, of weapons systems for the military departments, and to engage in such research and development of weapons systems not under the immediate jurisdiction of any military department as the Secretary of Defense, after consultation with the Joint Chiefs of Staff, may assign to such agency.

"'Nothing in this provision of law shall preclude the Secretary of Defense from assigning to the military departments the duty of engaging in research and development of weapons systems necessary to fulfill the combatant functions assigned by law to such military departments.

"'The Agency shall have authority to enter into contracts with persons, corporations, colleges, universities, institutes, Government agencies, and such other organizations as the Secretary of Defense may approve, for advanced basic or applied research, or development of, weapons systems, or to engage in such research or development within the Agency by utilizing employees or consultants of the Agency.'

"The Secretary of Defense shall assign the weapons systems developed by such Agency to such military department or departments for production and operational control as he may determine.

"Nothing contained in this provision of law shall be construed as repealing, limiting, abrogating or modifying the limitations on the powers and duties of the Department of Defense and the Secretary of Defense as are now contained in the National Security Act, as amended."

Mr. MILLER. Your opinion was that the Secretary of Defense had authority without any added legislation?

Mr. LANMAN. That is correct.

Mr. MILLER. But now that we have added language, or it is in the bill, might that not alter the situation?

Mr. LANMAN. It might. We have not had an opportunity——

Mr. MILLER. To see it, and neither have we.

Mr. MAHON. That has been a very recent development.

Mr. FLOOD. You agree, of course, that this is the superior command?

Mr. MILLER. If it becomes law, and I think the counsel should be given a chance to consider that. I think we are premature in discussing the language before we know what the law will be.

Mr. MCNEIL. I read the draft of the amendment made on the floor a while ago, and while I am not the authority on the legal aspects, it would seem to me that the language of the estimate would still be quite satisfactory, inasmuch as this bill is for funds to the Advanced Research Projects Agency.

Mr. CROSBY. I think perhaps what might be needed is that in the first portion of the proposed language it should be changed

to say "as authorized by law," or we might put in "as authorized by H. R. so and so."

Mr. TABER. You had better say "as authorized by law or by H. R. so and so."

Mr. FLOOD. Just exactly where are we? We are going to have more trouble with this point on the floor than with the rest of the bill. What are we going to do with it?

Mr. MILLER. I notice that the final paragraph of this amendment is:

"Nothing contained in this provision of law shall be construed as repealing, limiting, abrogating, or modifying the limitations on the powers and duties of the Department of Defense and the Secretary of Defense as are now contained in the National Security Act, as amended."

Mr. TABER. That would avoid its being a limitation, all right.

Mr. LANMAN. We are not able to tell you in this short time what the actual impact of this amendment, if enacted, will be on the National Security Act.

Mr. MAHON. Can you give us tomorrow a statement on this in order that we may proceed with the printing of the bill and the hearings and get ready to carry it on the floor?

Mr. LANMAN. I certainly will consult with the General Counsel and provide you with that.

Mr. MAHON. You think you can do that by tomorrow?

Mr. LANMAN. Yes, sir.

(The statement requested follows:)

GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE,
Washington, D. C., January 16, 1958.

In accordance with the request of the chairman, the following statement is made with respect to the effect of section 7 of the amendment to H. R. 9739, proposed by the Armed Services Committee and passed by the House January 15, 1958 (see Congressional Record, p. 414), on the language of the appropriation for the Advanced Research Projects Agency recommended by the President in his message of January 7, 1958, House Document No. 298, 85th Congress, 2d session, page 2.

While the Department of Defense has not had sufficient time to make a complete study of the amendment, it is the opinion of the General Counsel of the Department of Defense, as indicated in an earlier statement included in these hearings (copy attached), that the National Security Act, as amended, constitutes adequate authority for the establishment of this Agency and for the appropriation of funds for the purpose of the Agency, and that, therefore, additional statutory authority is not legally necessary.

It is the further opinion of the General Counsel of the Department of Defense that upon the transfer of research and development functions to the Agency the following provisions of section 2353 (a) of title 10, United States Code:

"A contract of a military department for research or development, or both, may provide for the acquisition or construction by, or furnishing to, the contractor, of research, developmental, or test facilities and equipment that the Secretary of the military

department concerned determines to be necessary for the performance of the contract. The facilities and equipment, and specialized housing for them, may be acquired or constructed at the expense of the United States, and may be lent or leased to the contractor with or without reimbursement, or may be sold to him at fair value. This subsection does not authorize new construction or improvements having general utility."

constitute adequate authority in existing law for the appropriation of funds to the Agency for construction and acquisition of research and development facilities.

In conclusion, it is the opinion of the General Counsel of the Department of Defense that the amendment, if enacted into law, would require no change in the language of this appropriation as submitted by the President.

MAURICE H. LANMAN, JR.,
Assistant General Counsel (Fiscal Matters).

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"Section 202 (c) (5) of the National Security Act, provides as follows:

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transfer, reassign, abolish or consolidate functions of the Department of Defense subject only to limitations not material here relating to combatant functions and the requirement for separate administration of the military departments, and subject only to the requirement for reporting to the Congress.

"(3) Does this newly created organization have to be completely self-contained or may it call on the military departments to perform administrative functions such as the preparation and signing of contracts, disbursement of funds, and other support activities?

"The answer is that there is ample authority and precedent for requiring the military departments to perform such administrative functions, with full control being retined in the Agency."

Mr. LANMAN. One other point should be made. The language as submitted by the President would include an authorization to use funds for construction and acquisition of those facilities necessary for the research and development projects to be conducted by this Agency. That language is supported by title 10, section 2353, primarily a research and development statute which authorizes the use of funds for construction and acquisition of facilities when the work is being done by contractors, which is one of the ways this Agency would do its work.

So if it is assumed that the text of the amendment referred to does not include any contruction authorization, and if the rest of the bill as reported by the Armed Services Committee does not contain any construction authorization for the Agency, there might be a question, and the record should show that we think the statute cited, title 10, section 2353, would support the language for construction contained in this estimate.

Mr. MCNEIL. I think this Agency would quite likely, over a period of 1, 2, or 3 years, not do any huge construction work, but put in a test stand for a missile or something of that nature.

Mr. FLOOD. Where are the headquarters for this outfit going to be?

Mr. MCNEIL. I would assume they would be in the Pentagon.

Mr. FLOOD. I would assume that would be the last place they would be.

Mr. LANMAN. That is not the type of construction contemplated by this language. The basic statute actually inhibits the use of its authority for anything other than the type of thing needed especially for research and development.

Mr. MAHON. Mr. Secretary, I suggest that in view of the time factor involved, if we are going to get this bill out of the House and before the Senate, we must act rapidly, and if this does not shape up correctly you should make your position quite clear to the Senate so that in the final version of the bill we will accomplish the will of the Congress and of the Government.

General MOORE. May I make a statement off the record.

Mr. MAHON. Sure.

(Discussion off the record.)

Mr. LANMAN. May I make one more comment. Some concern was expressed with regard to the breadth of the authority given to the Secretary for transfers out of this account. I have con-

sulted with your staff and we have come to an agreement with regard to language wihch would insure that none of this money could be taken from this appropriation and put in any other appropriation for use for any purpose other than the purposes for which it is appropriated here. This is in accord with the intent as expressed by the Secretary when he was here.

Mr. WIGGLESWORTH. For which it is appropriated to the new agency?

Mr. LANMAN. Yes. The second proviso has been reworded, and I will give the reporter a copy of the amendment.

Mr. MAHON. I think you might read it into the record.

Mr. LANMAN. It reads: "*Provided further*, That such amounts of this appropriation as may be determined by the Secretary of Defense may be transferred to carry out the purposes of this appropriation from this appropriation to those appropriations under the Department of Defense which are being utilized for related programs to be merged with and to be available for the same time period as the appropriation to which transferred."

The intent is now crystal clear that the money would be used only for the purposes for which appropriated to this agency, wherever used.

Mr. FLOOD. That does not satify me. You have not yet stated the purpose of the agency.

Mr. TABER. That limits your operation to the particular six items that are set forth in this bill. I do not know if you want to do that or not.

Mr. LANMAN. I believe Mr. McElroy made it clear there were two immediate programs that this agency would undertake, antimissile missiles and outer space projects, and that he did intend, that as things progressed, he would assign additional research and development type missions to this agency where they did not fit clearly in any of the military departments, and I think this language is adequate to take care of the immediate problem as well as projects that might come up later.

Mr. WIGGLESWORTH. What you are saying is that transfers could only be made at the outset for antimissile missile work and outer space work?

Mr. LANMAN. For the time being, yes.[24]

On January 21, 1958, Mr. Mahon, from the House Committee on Appropriations submitted the report to accompany H. R. 10146. The requested funds were included in the amount of $10 million for the Advanced Research Projects Agency to be derived by transfer from such annual appropriations available to the Department of Defense as may be designated by the Secretary. The committee report pointed out that—

> The need for clear-cut and coordinated programs in the research and development phases of advanced science programs has been obvious for some time. The lack of effective direction and coordination has undoubtedly contributed to the inability of the Department to go forward as rapidly as necessary in these important areas. These same deficiencies have contributed to inefficient use of funds.

[24] Ibid., pp. 382–387.

All too often, perhaps, the proposed cure for problems facing the Department is another office and more money. Generally speaking, they have failed because the new offices did not have sufficient authority to make final decisions or direct the military services in the performance of their work, with resulting ineffectual action and loss of time and money in different phases of the missile and research and development programs.

The Committee notes with gratification that the Director of the Advanced Research Projects Agency will report directly to the Secretary of Defense, and in the words of the Secretary will have the authority to "take whatever steps he needs to take in order to get this job done." It is contemplated that he will have control of the funds available in these particular fields, although the agency will make full use of the personnel in the various military departments working in these fields.

To assist in providing this authority, language was requested and is contained in the bill to permit the Secretary of Defense to transfer funds for programs in these fields, presently being carried out by the military services, to this agency. It was reported that up to $118,000,000 may be involved in this immediate transfer of funds.

Language is also included which will permit transfer of funds from this agency to the military services to carry out the authorized programs of the agency. This language provides means for full use of personnel of the military services working in these fields.

To assist in securing the proper scientific and technical personnel for this agency language is carried in Title VI of the bill for the authorization of an additional 15 professional and scientific positions and 10 positions in grades 16, 17, and 18 of the General Schedule over and above those now authorized by law.

If it is to be successful the Advanced Research Projects Agency must not be allowed to become just another layer of paperwork in the Office of the Secretary of Defense. It must be clothed with the authority and the control of funds necessary to conceive, coordinate, and implement research and development of essential programs of advanced science. If this is done, it could assist in large measure in bringing order and efficiency out of the chaos which has characterized efforts in this area in the past. The Committee will expect a full report during the hearings on the budget for 1959 of the actions taken in this respect and the specific work performed and to be performed by the Agency.[25]

On January 23, 1958, the supplemental defense appropriation bill for 1958 passed the House [26] and was introduced in the Senate. Hearings were held by the Senate Committee on Appropriations which discussed the authorization and funding of advanced research projects.

Senator SALTONSTALL. I would like to bring this out to the Secretary of Defense. I have just come from the Armed Services

[25] Supplemental defense appropriation bill, 1958. Report from the Committee on Appropriations to accompany H. R. 10146. House of Representatives, 85th Cong., 2d sess. January 21, 1958. Rept. No. 1288.

[26] Daily Congressional Record, January 23, 1958, pp. 646-668.

Committee where we authorized these new construction appropriations. We left out that section that the House put in about the establishment of the advanced research project.

Now, it is my understanding that the General Accounting Office is satisfied that the money can be properly appropriated if the Appropriations Committee uses the language, sufficient language to show that it is proper, that it has been authorized.

Now, I call your attention for that reason to line 6 on page 2 of this bill, which uses the words: "For expenses necessary for the advanced research project agency as may be authorized by law."

Then I call your attention also to page 5, general provisions, section 601, which says: "The Secretary of Defense may authorize within the Advanced Research Projects Agency."

Now, it was my understanding that that Agency has not already been set up in detail.

Secretary McELROY. That is correct.

Senator SALTONSTALL. So I would simply call that to your attention to discuss with your legal counsel that if this committee acts on this bill promptly, within the next day or two, that you are sure that the language in those two places in this appropriation bill is sufficient to cover the activities that you want to carry out.

Secretary McELROY. We will be very glad to do that.

Also, there is a question, as I understand, as to whether we should not take action prior to this action taken by the Congress to set up this Agency. We are quite prepared to do this. We have held off doing so because we had in mind that we would issue the directive simultaneously with the appointment of the individual who would be the director of it.

Senator SALTONSTALL. You would either have to change that language or get the Agency set up before this bill becomes law.

Secretary McNEILL. We will work with your staff and submit a draft of any language changes which may be needed.

Secretary McELROY. We may set up the Agency without waiting for the appointment of the man to take it on.

Senator SALTONSTALL. Then you want to make sure that the language as may be authorized by law on page 2 is sufficient to cover the action, your executive action in setting up this Agency.

Secretary McELROY. Right. Thank you very much.

DEPARTMENT OF DEFENSE,
OFFICE OF GENERAL COUNSEL,
Washington, D. C., January 29, 1958.

As suggested by Senator Saltonstall during the course of the hearings of the Senate Appropriations Committee on H. R. 10146, a bill, making supplemental appropriations for the Department of Defense for the fiscal year ending June 30, 1958, and for other purposes, careful consideration has been given to whether the language of the bill as passed by the House would be legally sufficient, when enacted into law, to permit the Department of Defense to make expenditures necessary for the conduct of the activities of the Advanced Research Projects Agency from the appropriation.

(1) Senator Saltonstall's first question related to the use of the words "as may be authorized by law" at page 2, line 6, under the heading "Advanced Research Projects Agency."

With respect to the use of the phrase "as may be authorized by law," it is the view of the Department of Defense that authority exists in law for the establishment of the Agency and for carrying out the activities proposed to be included in its charter. Therefore, it is the opinion of the Department of Defense that the inclusion of this phrase in the appropriation as finally enacted into law would in no way limit the use of the funds for the purposes stated.

It is the further view of the Department of Defense that if the appropriation were enacted into law without the phrase "as may be authorized by law" the conclusion would not be altered, since the appropriation would have been made "For expenses necessary for the Advanced Research Projects Agency," and the funds so appropriated could be applied to the objects for which the appropriation is made. The General Counsel of the General Accounting Office states that he concurs in the view of the Department of Defense as to the effect of the deletion of the phrase "as may be authorized by law."

(2) Senator Saltonstall's second question related to the use of the phrase "The Secretary of Defense may authorize *within* the Advanced Research Projects Agency * * *" appearing at page 5, lines 4 to 6. [Italics supplied.]

With respect to this provision, it is the view of the Department of Defense that in the event that the enactment of the section into law should occur before formal steps have been taken to establish the Agency, such fact would have no effect on the right of the Secretary of Defense to avail himself of the authority to create the positions provided for in the section upon subsequent establishment of the Agency.

MAURICE H. LANMAN, Jr.,
Assistant General Counsel (Fiscal Matters).[27]

In the report which was submitted by Mr. Hayden from the Committee on Appropriations on January 31, $10 million in transfer authority was approved for the Office of the Secretary of Defense to engage in advanced research. The committee report also stated that—

> Language was requested by the Department authorizing the creation of 15 positions in the professional and scientific service and 10 positions in grades 16, 17, and 18 of the general schedule to carry out the programs relating to advanced research activities. The committee has approved this request but has deleted specific reference to the Advanced Research Projects Agency.[28]

The Senate debated the bill on February 3, 1958, Mr. Hayden pointing out that—

> The matter came to the committee after the House of Representatives voted, in connection with the bill, for the establish-

[27] Supplemental defense appropriation bill, 1958. Hearings before the Senate Committee on Appropriations, 85th Cong., 2d sess., on H. R. 10146. January 28, 1958, pp. 37–39.
[28] Supplemental defense appropriation bill, 1958. Report from the Senate Committee on Appropriations to accompany H. R. 10146. S. Rept. No. 1238, January 31, 1958.

ment of an advanced research projects agency, and voted to make available to it, until expended, $10 million, to carry it on.

This advanced research work should be undertaken immediately, as everyone agrees.

Our committee disapproved the language establishing the Agency because we thought insufficient study had been given to exactly what the Agency would be, and we believed it would be much better to appropriate the $10 million to the Secretary of Defense, and to give him the help he needed in connection with this urgent matter. We voted to allow the additional positions, as the House of Representatives had provided.[29]

The Senate passed the bill on February 3, and on February 6, it was cleared for Presidential action by House agreement to Senate amendments. Mr. Mahon explained the amendments as follows:

Mr. MAHON. Mr. Speaker, in agreeing to the Senate amendments on this bill, the Committee on Appropriations is following the action of the House in agreeing to the conference report on the authorization bill that has just been presented by the gentleman from Georgia, chairman of the Committee on Armed Services.

The Senate language relating to the so-called advanced projects research activities is in keeping with the language in the conference report just adopted. The language recommended and carried in the House version of this bill (H. R. 10146), was based upon the language for the Advanced Research Project Agency wording in H. R. 9739 as it passed the House. Since this language has been changed, the Committee on Appropriations has no alternative but to follow the lead of the House in agreeing to the language in the authorization act as now approved.

A further word. It must be clearly understood by the Department of Defense, however, that in agreeing to the Senate language as contained in H. R. 10146 the Committee on Appropriations will insist that the so-called supergrades and professional personnel authorized by this act be placed in positions directly concerned with the advanced research and space program activities authorized by H. R. 9739. The committee will expect the Secretary of Defense to submit a report in connection with the assignment of these super grades and positions in connection with the hearings on the 1959 budget estimate for the advanced research projects activities.

Mr. Speaker, to go further with reference to this problem of the conquest of space I should say it appears that there is considerable confusion in the Government as to just who is going to handle our growing and urgent programs for the conquest of space. The supplemental budget estimate submitted by the President on January 7, 1958, was based on the Department of Defense being responsible for these programs, specifically those programs having to do with defense. Now we find that the President is having a special study made to determine "the type of structure we may need to set up in the field of outer space—as to where it will be in the overall structure of the Government."

[29] Daily Congressional Record, February 3, 1958, p. 1314. The full debate runs from pp. 1313-1321.

This seems to be contradictory to the programs that were in operation at the time the supplemental appropriation bill was approved by the House. Never have the words of the House committee report accompanying the bill and submitted on January 21, 1958, been more appropriate.

The need for clear-cut and coordinated programs in the research and development phases of advanced science programs has been obvious for some time. The lack of effective direction and coordination has undoubtedly contributed to the inability of the Department to go forward as rapidly as necessary in these important areas. These same deficiencies have contributed to the inefficient use of funds.

Clear-cut and coordinated programs in this field must be formulated and implemented at once if slowdowns in vital areas of defense are to be averted.

This is no time for slowdowns in the contest for the weapons of the future, particularly in view of the fact that we are behind in these areas. As has been stated many time in the past this committee offers its fullest cooperation.

I hope that somewhere, somebody in the Government will decide what is needed so that we can cut out the redtape and confusion and get on with the work.

I also hope that we will not attempt to so divorce space projects from our necessary military efforts that we will lag behind as we did in the space-satellite program.

I do not underestimate the magnitude of the decisions that are required or the difficulties involved. Our weakness in the past has often been a result of lack of decisions. Now is the time to watch our step if we are to avoid a repetition of recent mistakes.[30]

Public Law 85-322 (85th Cong., H. R. 10146) was approved on February 11, 1958. In making supplemental appropriations for fiscal 1958, the act contained provision for satellite programs:

TITLE I

OFFICE OF THE SECRETARY OF DEFENSE

SALARIES AND EXPENSES

The Secretary of Defense is authorized to transfer not exceeding $10,000,000, to remain available until expended, from any appropriation available to the Department of Defense for the current fiscal year for such advanced research projects as he may designate and determine: *Provided*, That such amounts as may be determined by the Secretary of Defense, to have been made available for related programs in other appropriations available to the Department of Defense during the current fiscal year may be transferred to and merged with this appropriation to be available for the same purposes and time period: *Provided further*, That such amounts of this appropriation as may be determined by the Secretary of Defense may be transferred to carry out the purposes of advanced research to those appropriations for mili-

[30] Daily Congressional Record, February 6, 1958, p. 1604.

tary functions under the Department of Defense which are being utilized for related programs to be merged with and to be available for the same time period as the appropriation to which transferred.

TITLE VI

GENERAL PROVISIONS

SEC. 601. In order to more effectively administer the programs relating to advanced research activities, the Secretary of Defense may authorize the creation of fifteen positions in the professional and scientific service in accordance with the provisions of Public Law 313, Eightieth Congress, as amended, and to place ten positions in grade 16, 17, or 18 of the General Schedule, in accordance with the procedures prescribed in the Classification Act of 1949, as amended. These positions shall be in addition to those now authorized by law.

ADDITIONAL HEARINGS IN WHICH ARPA WAS DISCUSSED

On January 27, 1958, hearings were begun on the Department of Defense appropriations for 1959 by the subcommittee of the House Committee on Appropriations, entitled "Overall Policy Statements." In presenting his general statement, Secretary of Defense McElroy discussed the Advanced Research Projects Agency:

> I mentioned in connection with the continental defense program the proposed Advanced Research Projects Agency. A total of $340 million is requested in the 1959 budget for antimissile missiles, advanced satellites, and other space-systems projects. Such projects do not fall clearly within the responsibility of any one of the military services. It is therefore entirely logical that research and development work on such projects be placed under centralized control and direction without regard to normal concepts of military roles and missions and assigned to one of the services only when they approach operational capability. Our strength years from now will be importantly influenced by our effectiveness in this and other advanced fields of military research activity.[31]

UTILIZATION OF INFORMATION AND EXPERIENCE OF ARMY BY ARPA

Mr. MAHON. Do you not think ARPA is going to call on Douglas and the Army Ballistic Missiles Center and these other people to work on this program? I cannot imagine that we would throw away the know-how and the experience of the Army Ballistic Missile Center and Douglas in this Zeus program. Could you, Mr. Secretary?

Secretary BRUCKER. No; we have no desire to do that. The matter is in this posture—the amount that was in the original 1959 budget which was transferred to ARPA was a budget amount which we in the Army had conceived would bring this

[31] Department of Defense appropriations for 1959. Hearings before the subcommittee of the Committee on Appropriations, House of Representatives, 85th Cong., 2d sess. Overall policy statements. p. 15.

about by our original target date, and I want to assure you that long before sputnik these men had presented this to me so that I was cognizant of it; I was in full sympathy with it and we were moving on the thing. And for 18 months prior thereto the Army had been interested in it and was working on it, but we did not give any publicity to the matter. We did our best, as a matter of fact, to downgrade any publicity or knowledge because we did not want to let anybody, the enemy or anyone else, know what was going on.

Now, following the time that sputnik went up and the urgency became a very apparent matter because of what had occurred with the booster capability, the Army then began to intensify its study under General Gavin and other officers in research and development. They brought in a study plan. That study plan was reviewed by the Chief of Staff, and the Chief of Staff then brought it to me. We considered that that should go to the Defense for the purpose of having that acceleration possibility revealed to them. At that time, the Secretary of Defense, who was new, Secretary McElroy, discussed it and disclosed the fact that he had this ARPA organization in mind and that, as a matter of fact, it was going to take over satellites and in his mind ought to take over the antimissile missile, or as we now call it the antiballistic missile missile. At that time the study went on by the Army. We then in the absence of having a director of that organization saw Mr. Holaday, who was the Director of the missile program—the Director of Missiles as distinguished from ARPA—and engaged his interest to the point where he was conversant with the details of what was going on. That is the posture in which this thing was until a week or so ago when a briefing was given, I think within the last week, to Secretary Quarles, the Deputy Secretary of Defense. He is more or less in that particular bracket of interesting himself for the Secretary of Defense in the weapons system. There was, of course, a consideration of the distant radar, the early detection system of it, inasmuch as the Air Force was interested particularly in that, and also the missile itself. There was a consideration of that.

On January 16, 1958, the new Secretary of Defense issued the directive without locating the matter of operational capacity, but giving the Army the direction to proceed with the missile part itself, with that portion which has to do with research and development of the missile. We began that and we not only began it but continued it under the plan we had, the original plan. We called to the attention of Secretary Quarles and others the matter of the accelerated plan. That is pending at the present time, pending the coming of a new man as the Director of this ARPA. That is where we are at the moment.[32]

"FISCAL YEAR 1959 BUDGET REQUEST FOR THE DEPARTMENT OF DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

"During the formulation of the fiscal year 1959 budget, it was decided to establish the Advanced Research Projects Agency in the Office of the Secretary of Defense for the direction and per-

[32] Ibid., February 6, 1958, p. 380.

formance of certain advanced research and development projects. It was also decided that the new Agency initially would be given full responsibility for research and development of the antiballistic missile missile and for outer-space projects.

"Since the decision to establish the Advanced Research Projects Agency was made subsequent to submission by the military departments of their fiscal year 1959 budget requests, these requests included amounts for antimissile missile and outer-space programs. Consequently, in the late stages of formulating the Department of Defense budget, the pending service requests were adjusted to combine the amounts to be requested for antimissile programs and outer-space programs in a single request for the Advanced Research Projects Agency. Therefore, the fiscal year 1959 request of $340 million for the Agency includes $64.1 million which had been initially included in the Army budget request for antimissile missile programs, and $174.3 million which had been initially included in the Air Force budget request for antimissile missile and outer-space programs."

EARTH SATELLITE PROGRAM

Mr. MAHON. In the "weapons of the future" category we have discussed the antiballistic-missile missile. Are you in the earth satellite program? I wish to join with other members in telling you how happy I was that you launched our first satellite. I want to say that I had so much confidence I was not surprised.

I might say at the same time I have had no confidence whatever in this Vanguard thing. I hope eventually they get one up, but we won't worry about that at the moment.

Do you have money in here for military satellites? Are you in that field, or who is in that field?

Secretary BRUCKER. Maybe I had better take that one.

We got the green light to go ahead with the launching of two Jupiter C-propelled earth satellites on or about November 10, 1957. That is, that is when the green light was given to us. We were given a funding in the magnitude of $4 million for that job.

We proceeded, and you know with what result, as to the first. We are proceeding with respect to the second. It will be now within the period of the next couple of months.

In the meantime, we have asked the Department of Defense, even though ARPA is not functioning actively, to permit us to go ahead with some more sophisticated satellites. That is pending at the present time, and was a matter of discussion with the Director of Guided Missiles, who was substituting for the ARPA Director, as recently as Monday and Tuesday of this week. Yesterday was the last that I knew about it.

So the matter is now at the stage where we have been given the green light, of course with the money to fire the second one, but the others which are to follow are on the verge one way or the other, and I don't know just when we shall hear.

Mr. MAHON. Our first satellite was not a military vehicle, although of course it would naturally give some information and

experience which would be helpful in a military sense. I know that the Air Force is in that picture. Are you in that picture other than to the extent you have discussed?

Secretary BRUCKER. We are in it to the extent that the matter is under intense study by the Army to do whatever we are called upon to do in the out yonder. We feel, however, that these are so near at hand, and we are so ready to do the job, that we ought to take the initiative to suggest it to the Department of Defense. We have taken that initiative.

As to the balance of the program or programs which we have, and what we think we can do, we are studying and will be willing to present them to ARPA and the Department of Defense for whatever the need is.

Mr. FLOOD. Will that include antisatellite satellites?

Secretary BRUCKER. Off the record.

Mr. MAHON. Last year when the Navy came up through Admiral Bennett and Dr. Hagen to get $34 million in additional funds for the Vanguard satellite program, I said to the witness, in July, or early August, that I had informed the Army could already have launched an earth satellite had the Army been given the assignment in the first place.

Of course, one cannot say with finality what could have been done, but, generally speaking, could the Army, in the opinion of the Secretary of the Army and the Chief of Staff, have launched a satellite by the time the Soviet Union launched one or before, had sufficiently important steps been taken, say, in the calendar year 1956 or 1957?

Secretary BRUCKER. Mr. Chairman, you must know my reluctance to reflect upon any person. I do not think you want any culpability or anything of that kind, because there isn't any.

Mr. MAHON. No.

Secretary BRUCKER. But the Army did in 1956, in the month of September, put up the same Jupiter-C rocket launching system an instrument payload which went over 600 miles high and 3,300 miles in range.

Then of course following that we put up last August another one where the nose cone came through intact, and it was fished out, as you know. That was likewise a Jupiter-C.

So over the period of the last 2 years, and in all candor to you and without any attempt to reflect on any other service or any other person, I can say to you that the Army ballistic missile team at Huntsville has had the ability to operate the Jupiter-C and to launch a satellite of the type that was launched last Friday night.

Mr. MAHON. Of course you have not had the capability and do not now have the capability of launching a satellite of the size and weight of the Soviet Union No. II Sputnik.

Secretary BRUCKER. That is correct, not with the Jupiter-C.

Mr. MAHON. That is all you have had to do the launching with, except, of course, the Jupiter, which is not yet very operational.

Secretary BRUCKER. That is right. Let's put it this way: Not completely operational at the moment.

Mr. FLOOD. What do you need? Engine? Thrust? Fuel? What are you missing?

Secretary BRUCKER. That is it. Thrust, propulsion. We have the technique, the know-how, and the guidance, but we need the additional propulsion.

Mr. FLOOD. When are you going to put one up which weighs a half ton?

Secretary BRUCKER. That is a matter for the future, and I just don't know the answer to that as to time, our ability to do it, or the jurisdiction to get into it.

Mr. MAHON. Do any of these satellites which you have been thinking about, any of these proposed satellites of the future which you have discussed, include weights of much greater magnitude than the present satellite?

Secretary BRUCKER. Oh, yes, very much greater.

Mr. MAHON. How great does that weight go?

(Discussion off the record.)

Secretary BRUCKER. Theirs was eleven-hundred-some-odd pounds. I don't want to comment except to say with respect to theirs that Dr. von Braun—I give you this secondhand—remarked to me the night we were waiting for our own to come in that it is surprising the amount of weight in the Russian hardware in Sputnik II. I hope you will get the story from him of the ability that we have to put up something much larger than Explorer, and the degree to which our sophistication and miniaturization could accomplish the purpose in that field.[33]

In the hearings before the Preparedness Investigating Subcommittee of the Senate Armed Services Committee, "Inquiry Into Satellite and Missile Programs", there was some discussion of the organization for outer space projects on November 27, 1957:

Mr. WEISL. Mr. Secretary, on November 15 I believe you announced the creation of a post for a manager of antimissile and military space-project developments. Have you made that appointment?

Secretary MCELROY. No; we have not made the appointment. I wish that I had had time to settle into that one and do it because we would like to do it as quickly as we can. But the recruitment has not yet been accomplished. We want a very good man for the job.

Mr. WEISL. What is the purpose of that post?

Secretary MCELROY. The purpose is an immediate one: to pull under a single manager—this is the first time this has been done in the Defense Department—actual operating units for the research and development work that goes on in the antimissile missile field and in the satellite and space applications field.

Mr. WEISL. What power will that manager or director have?

Secretary MCELROY. He would have complete responsibility.

Mr. WEISL. In the same way that Mr. Holaday has it?

Secretary MCELROY. We have a different point of view on this man. We feel that these programs have not gone so far but that we can pull them together without any slowing down of the de-

[33] Ibid., pp. 389–391.

velopment of those programs under a single director, a single manager. We think that there is sufficient complexity in both of these fields that the research and development assignment could very well be handled outside of the services as part of the Department of Defense, and then as you come close to the time when there may be an operation of this weapon, whatever it may be, it would be turned over to one of the services for it to deploy and use.

It is not thought that this agency would actually serve as a deploying agency.

Mr. WEISL. Do you not think, Mr. Secretary, and I am merely exploring, Mr. Secretary, you understand that, of course, do you not think that creating a post of a missile director on the one hand and then an antimissile director on the other hand might just add a little more complexity and more confusion? Why cannot the director of the missile program also be the director of the antimissile program?

Secretary MCELROY. We considered that. We reached a conclusion, which we think is a right one, that the man who is head of the missile program in this country has got about as much on his shoulders as any one man should have. We think Mr. Holaday is loaded with as much responsibility as he should have in order to give stimulation and coordination to the missile program. For that reason, we felt that what we call advanced weapons—which is our term for that advanced-weapons agency, if that happens to turn out to be the term that we use—should not be put also upon Mr. Holaday, but that we should choose someone else who would then organize in a different way from the way Mr. Holaday operates to make his job effective and resultful.

Mr. WEISL. Would not the Army, the Navy, and the Air Force have their own antimissile missiles?

Secretary MCELROY. They would not work on antimissiles under this concept. The work that they have done in the past would be pulled together and centralized within the single-manager agency that I am describing to you.

Mr. WEISL. Would that single manager have authority over the antimissile activities of the people in the Army and in the Air Force and in the Navy, or would it be, as you said, the same as Holaday who would not have that direct authority over those people?

Secretary MCELROY. He would have authority. Again it might very well be through the Secretary of Defense, but we have discussed this thoroughly with all of the departments of the Defense Department, all of the Army, the Navy, and the Air Force, and it is fully agreed when this agency that I am discussing takes form, it will take over all activities that any of the services are conducting in these areas. Up until then, in order not to lose any momentum, each of the agencies that has been working in these areas will continue their programs.

Mr. WEISL. This man will also be a director of the satellite program, the same man.

Secretary MCELROY. He would have satellite applications?

Mr. WEISL. Is not the satellite very closely interrelated with the ballistic missile? Is not the satellite a projection, instead of

projecting a warhead to a target, you project a satellite in orbit? Does not that really belong to the fellow that has got charge of missiles?

Secretary McElroy. Yes. The kind of satellite applications that we are talking about are not the type which are in the IGY. That would continue with Mr. Holaday, in our thinking.

We are talking about the highly technical missile applications which may go quite far, and again I think we had better talk on that later.

Mr. Weisl. That is what I am talking about. In other words, is not any kind of satellite another type of object that is being launched in orbit into outer space? In other words, instead of launching a warhead to a target, you launch a satellite in orbit into outer space.

Now, does that not belong to the fellow that has charge of missiles? I do not want to belabor the point.

Secretary McElroy. In our judgment, it did not. They do have in common the requirement that there be a thrust into outer space. That much they do have, but that is not the end of the road by any means on the antimissile missile, nor is it on the various satellite applications.

* * * * * * *

Senator Johnson. Should the organization for future development of outer space, in your opinion, be located in the Pentagon or be established in some civilian agency like the Atomic Energy Commission?

Mr. Rockefeller. Well, because of its intimate relation to the military aspects of our national security, it would seem to me that the Secretary of Defense should have prime responsibility in making the decision where it should be placed so that first responsibility will be to our national security.

Senator Johnson. Now, are you saying it should be under him or not? You ought to bear in mind it includes such nonmilitary things as control of the weather. Can we expect the Defense Establishment fully to develop peaceful uses of outer space when their budgets are already low and they are trying to get adequate weapon development and other things. We have the same problem here that we had when we set up the Atomic Energy Commission. The Congress and the country at that time decided that although there was a pretty direct relationship between defense and atomic energy work, that there ought to be a separate and independent civilian agency. I wonder if you do not think the same thing should happen as far as outer space is concerned?

Mr. Rockefeller. We did not want to preclude it in the discussions, but we did not feel that we had enough information to warrant a decision in that respect, and that the man who would be in the key position to know what should be done, in consultation with the President, would be the Secretary of Defense.

Senator Johnson. So you would pass that one for the moment?[34]

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[34] Inquiry into satellite and missile programs. Hearings before the Preparedness Investigating Subcommittee of the Senate Armed Services Committee, 85th Cong., 1st and 2d sess., pt. I. November 27, 1957, pp. 217–219; January 10, 1958, pp. 1055–1056.

On February 26, 1958, the Senate Preparedness Investigating Subcommittee met to hear the report of the Secretary of Defense on accomplishments of the Department of Defense on the recommendations of the subcommittee dated January 23, 1958. The following discussion took place on ARPA:

Senator BRIDGES. Mr. Secretary, you are familiar with the National Security Act of 1947; are you not?

Secretary MCELROY. Well, I am familiar with it, unless you take a very specific point which may be outside of my knowledge of it.

Senator BRIDGES. Well, in this 1947 Security Act in the Department the various provinces, shall we say, the Navy, the Air Force, and the Army, were made operating units, were they not?

Secretary MCELROY. Yes.

Senator BRIDGES. Now, one of the fears that I have and which is shared by many, is that the Department of Defense has become more than what it was intended to be and that as the result of time over the years, and that it was intended to be a policymaking division and that the operating units were still to be the Army, the Navy, and the Air Force.

In establishing this Division of Advanced Research with the multiple number of people that have been employed in the Defense Department, are we not getting away from the theory under which the Department of Defense was created, which was for it to be an overall policy division along with the operations of the Army and the Navy and the Air Force?

Secretary MCELROY. The Advanced Research Projects Agency is an operating agency.

Senator BRIDGES. Well, I mean, physically in the Department of Defense.

Secretary MCELROY. We feel it should be but, I say the question you have raised is a great deal—going to be faced a great deal more fundamentally in the discussion of improvements of organization that will be coming to the Congress. I think without any question that is going to be one of the fundamental questions that is going to have to be answered by this country because it really strikes at the heart of the whole question of whether or not you are going to make those improvements in organization which many people regard as essential.

Whether that is going to be a proposal from us to the President, I do not want to predict, but most of the people that we discuss organization improvements with believe that there must be a greater centralization of authority in the Department of Defense which would involve, of course, more operating control rather than less.

Senator BRIDGES. The point that I want to make is that you have a pretty essential research and development and advancement program and it seems to me that if you are going to have very close touch with the people that are going to operate, your operational efforts ought to be in the services and not in any policymaking division of the Department.

Secretary MCELROY. Well, as we said when we discussed the Advanced Research Projects Agency, Senator Bridges, we expect

to have research development on those weapons systems which naturally fall within the areas of the individual services and they would be handled and carried on by that service, we are not going to try to take everything in the Department of Defense.

The reason for the Advanced Research Projects Agency and the reason we think it is important and very important is that there are increasingly, as you develop these sophisticated weapons systems, certain systems which do not fall naturally into 1 of these services, that may naturally cover 2 or 3 services, or they may seem so strange that they do not really naturally apply to any one of them, so that the need is to have an agency for research and development only which would supply the need for an interservice kind of weapons system or for a weapon system which had no natural home among 1 of the 3 services for it to land in, it seems necessary in order not to overlook or not to be able to handle development in the future of that nature which may be more important than the individual service assignment.

Senator BRIDGES. Well, in that case, will that not duplicate or triplicate in some cases the work going on in the services?

Secretary MCELROY. No; that will not. In fact, there is not going to be any satellite program in the services except as directed by the Advanced Research Projects Agency and that does not mean the Army will not be throwing some satellites into the air and it won't mean that the Air Force also won't be and maybe the Navy will be; but the point is that the entire program will be directed and controlled by a single agency of the Department of Defense.

Senator BRIDGES. Will they establish separate laboratory facilities, and so forth?

Secretary MCELROY. Well, they may. If these laboratory facilities are available in the services, they certainly will not, but if you happen to get into a field of research and development where the facilities are not available in one of the services, then this Advanced Research Projects Agency might set up a relationship with, maybe, a university or maybe, under an unusual situation, it might even build some facilities.

Senator BRIDGES. Well, what I am afraid of is this, here we are developing a fourth department. You have got the Army, the Navy, and the Air Force and you are going to have a fourth one, and I have always fought against that, and I always have been trying to get back to the original thing.

Will this operating Agency you are creating award contracts?

Secretary MCELROY. Yes.

Senator BRIDGES. That has never been done before; has it?

Secretary MCELROY. I do not know whether it has been done before, but certainly there have not been many instances. Mr. Quarles, do you know whether it has been done before?

Mr. QUARLES. I think that is a technical question. Probably it will not award contracts in the literal sense, probably they will use a contracting agency in the Department to actually award and administer the contract, although it is perfectly proper for them to do so. This is a matter of economy, in using organizations already established for that purpose, but usually the Department

of Defense has awarded contracts of this kind through a contracting office of one of the services as a matter of convenience.

Senator BRIDGES. Well, as I say, I want to see this developed in the best possible way and as I see the Department of Defense is getting into a situation which we tried to prevent when we set up SAC, that is, for these three services to be operational units and to have the Department of Defense as a policy unit with relatively small manpower, and what I am afraid of is this development of a fourth department that operates, that awards contracts, that has its own laboratories and does all of these things, and that was not my conception of what we should have going on, and I think that we ought to go very slow.

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Senator CASE. Mr. Secretary, to whom will appropriations be made?

Secretary MCELROY. Made to the Office of the Secretary of Defense.

Senator CASE. Customarily contract appropriations have been made to the Secretaries of the several Departments of Air, Navy, or Army.

When I was at Redstone recently I remember seeing that the tower down there had been designed to handle a rocket which could have up to 1 million pounds of thrust. And I notice here that you refer to the work on the rocket engine with a thrust of 1 million pounds. Is that done by the Air Force or the Army?

Secretary MCELROY. It is being done by the Air Force.

Senator CASE. And if consideration were given to production of facilities, who would make the contracts?

Secretary MCELROY. You say production facilities?

Senator CASE. ARPA will not get into production.

Secretary MCELROY. Well, develop a laboratory. This would have to be approved in the usual way by the Armed Services Committee.

Senator CASE. But to whom would that belong, to whom would the facilities belong?

Secretary MCELROY. Well, they would belong to the Department of Defense.

Senator CASE. To the Department of Defense as an entity separate and apart from the three services?

Secretary MCELROY. That is correct.

Senator CASE. Supposing you wanted to transfer an existing facility from one of the services? For example, supposing you wanted Huntsville used by ARPA, would you transfer from the Army to the Secretary of Defense?

Secretary MCELROY. Well, that is an interesting question because it has some pertinence to the present situation. I do not know what we would do. I think it depends really on what seems to be wise.

Senator CASE. Well, do you think you could?

Secretary MCELROY. I do not know that, either. We would have to consider that with our legal advisers.

On April 3, 1958, the Secretary of Defense made a further report on the progress made by the Department on the recommendations of the Senate Preparedness Subcommittee.

Secretary McElroy. Turning now to our recent activities in connection with our space program, during the past week the President has approved and I have directed the Advanced Research Projects Agency to proceed with several programs for launching a number of small unmanned space vehicles.

Roy W. Johnson, Director of ARPA, has issued instructions to agencies of the three military services to undertake these programs for ARPA.

The programs authorized include both scientific earth satellites and efforts to determine our capability of exploring space in the vicinity of the moon, to obtain useful data concerning the moon, and provide a close look at the moon. In technical terms these programs are called lunar probes.

Authority to undertake one, and possibly two, lunar probes was given the Army Ballistic Missile Agency at Huntsville, Ala. ABMA was also authorized to launch 2, and possibly 3 earth satellites. Modified Jupiter and Jupiter-C rockets will be used in these projects.

A program calling for three lunar probes was assigned to the Air Force Ballistic Missile Division, ARDC, Los Angeles, Calif. A Thor-Vanguard system with a third stage to be developed will be utilized in these projects.

Meanwhile, the naval ordnance test station at Inyokern, Calif., was ordered to develop a mechanical ground scanning system for use, when available, in lunar probes.

ARPA has a specific 1959 space program well formulated. At this point the program is still classified; however, I might say it involves strictly military space programs as well as a mixture of programs involving the securing of additional scientific data, some of which has military uses including the acquisition of new meteorological data.

We are taking special steps to insure that all interested elements are fully cognizant of our efforts in this area so that if it is decided to handle space matters in a different organizational fashion the transfer of purely scientific projects can be accomplished expeditiously. To this end the scientific portion of these experiments are being coordinated with the National Science Foundation, the National Academy of Sciences and the National Advisory Committee for Aeronautics. However, to avoid any gap in our work or lessening of a sense of urgency we are moving ahead in this area with what I believe to be a sound and imaginative program.

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Senator Stennis. Now just one word here concerning what you say with reference to the space agencies. That is at the bottom of page 6 as I have your statement before me. I did not have a chance to read the papers completely yesterday, but I believe the President announced yesterday more or less the details of his ideas, of his plans on that.

Secretary McElroy. Yes, he did, Mr. Chairman, and we are operating with complete flexibility. Whenever this new Agency is authorized, if that is the decision of the Congress, and certainly these projects are regarded as falling properly within the scope

of that Agency's responsibility, we are using that kind of flexibility which will permit us to turn over funds and anything else in order to make this switch to the new kind of organization of this program easy and undeterred.

Our position has been, and this has all been coordinated with the President, of course, and his scientific advisers, that this is of sufficient importance that while the question of the long-range organization of this matter by the United States Government is being considered by the Congress and a decision is being made, we should not be delaying in making plans for moving forward. But this is kind of an interim situation which we ourselves are quite willing to resolve in terms of any new agency that the Congress and the President decides is the right way to handle it.

Senator STENNIS. And you are making your plans in full accordance then with the recognition that the real decision and policy must be set?

Secretary MCELROY. That is right.

Senator STENNIS. Firmed up in future legislation.

Secretary MCELROY. That is right, sir. I think it is quite obvious that the Department of Defense will continue to be called on by such an agency to do quite a good deal of this work, because I do not think the country would want to duplicate these tremendously expensive facilities for rocketry, and rocketry, of course, is the basis of outer space research, so that I do not think that the country is going to lose anything by this, and as I say, we have no interest in retaining anything other than what the Government of the United States wants us to do as our part of this program.

Senator STENNIS. I am very glad to have your statement on that because it is a matter of great concern and legislation cannot be quickly formulated. Still you must move, and I know we agreed on your having certain authority in the last military construction bill and I thought maybe that the Agency you set up went just a little further than we intended in the law for it to do. There were no bad motives there. I did not contest it because I felt that you had in mind the primary situation of moving along without trying to set up anything that would embarrass the Congress or the President or anyone else as far as that is concerned in formulating the final plan.

Secretary MCELROY. We have assumed, Mr. Chairman, because we have been in accord with the concept, that nonmilitary use of outer space should be organized in a nonmilitary way. It is about the only way that I can see that we can be prepared to cooperate with other countries in scientific exploration of outer space.

I think it is very difficult to do that through a military organization. So that we have, as I say, simply been feeling that some agency—and we were the only one available—should be taking the bull by the horns to see that during the time the country was considering this question of the long-range organization of this effort we should move and then be prepared to shift whatever the country wanted us to shift to this new agency when it is finally created.

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Senator KEFAUVER. It says here that the matter is being worked out by the Department of Defense and the National Advisory Committee on Aeronautics, and also that you will review the programs that will be taken from the Department of Defense and put into this new agency, that there will be a transfer by the President of certain strictly scientific and nonmilitary matters from the Department of Defense to this new Astronautics and Space Agency. That is in the President's statement.

Secretary MCELROY. Yes; that will be done.

Senator KEFAUVER. Can you give us any idea about just what is contemplated in this transfer? I am glad to see that certain civilian parts of the program will be transferred. I think they should be under a civilian agency since they may not directly be related to military, but can you give us any information about what is contemplated?

Secretary MCELROY. This is the kind of thing which we have had a good deal of experience with with this same agency, or let's say its predecessor agency, the National Advisory Committee for Aeronautics, so we anticipate really nothing but favorable working relationships.

Our position is this: That as the President takes this decision as to which of these programs should be passed over to the new agency, the NAASA, I believe it is called, for its direction, we will then be available to do any parts of the program that are regarded as within our capability, or they will be their own way, but we are assuming, at least I would assume, that there would be certain parts of the program, because of the tremendous expense of duplicating facilities that we already have, we would probably be asked simply to make available to this new agency and we are quite prepared to do that.

Senator KEFAUVER. Certain things that they can delegate to the Department of Defense to do for them?

Secretary MCELROY. That is right.

Senator KEFAUVER. Mr. McElroy, the President's message speaks of a board, but it does not speak, that I can find here, of an administrator or a director or a cabinet head for this agency. I assume that there will be an administrator of high order with substantial responsibility, and it will not just be a board that——

Secretary MCELROY. I think you will find that there is one in there, Mr. Kefauver. In any case, I know that it is intended in all probability that the present Director of the NAACA would carry the same responsibility in this new agency, Dr. Dryden.

Senator KEFAUVER. And that the NAACA would be absorbed into the new agency?

Secretary MCELROY. That is right, sir. It would carry both fields of responsibility.

Senator KEFAUVER. Mr. Chairman, back in the later part of last year and early January in consultation with some I think capable scientists and some military people, I have no pride of authorship, I undertook to get up a rough proposal for the establishment of such a civilian agency to handle the civilian parts of space exploration and scientific development.

In order that it may be presented for public consideration and discussion and perhaps consideration by the Bureau of the Budget in preparing their proposal to the Congress, I am going to ask unanimous consent that this bill, S. 3180, which I filed on January 28, be printed in the appendix of the record.

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Senator FLANDERS. Now I would first like to make an observation on this National Advisory Committee for Aeronautics. As a member of the Armed Services Committee from the time I first came onto it I made it a part of my work on the committee to be thoroughly acquainted with it, and I think at one time I assisted in its recognition as the effective board that it has become, in maintaining a sufficient appropriation to make it useful.

I am glad that it has been used as the foundation for this new Board, and want to ask whether in your experience you have observed that it has worked in the past for research and development in both civil and military aviation. Has it not covered both of those fields?

Secretary MCELROY. It has, yes, Senator Flanders, and I think it has also been a model of working relationship between a high-grade research agency and the military in the development of both civil and military aviation.

Senator FLANDERS. You would expect then that when it is used as the basis of this new civil-space development it would make valuable contributions and make them freely to your military developments?

Secretary MCELROY. We would expect no difficulty in that respect, Senator Flanders, simply because of the favorable experience we have had in the field of aeronautics.

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Senator SYMINGTON. When something starts to orbit around the earth, how can you tell whether it has military significance or whether it hasn't?

Mr. QUARLES. Mr. Chairman, if I might just answer that question, of course military significance might be indicated by the types of radiations from the orbiting vehicle or might be indicated from other indications of the nature of the vehicle, but I think basically one could not say with definiteness that an orbiting satellite was or was without military significance. We have to get that from such indications as we can get from it, if I am addressing myself to the Senator's question.

Senator SYMINGTON. I thank the Secretary. My question arises because there seems to be a feeling that other agencies will handle the development of peaceful, nonmilitary orbiting. I was wondering how you could tell whether an orbiting unit around this country had or did not have a weapon in it, was or was not a reconnaissance unit, had or did not have a camera in it, had or did not have weather reporting devices, et cetera. I cannot quite see how you can say one unit will be a part of our effort of peacetime exploration of space and another will be strictly military. It is hard for me to understand that, in the same sense that is hard for me to understand for example where

the Army's mission stops from the standpoint of the land or the air.

Mr. QUARLES. I think I did somewhat misunderstand the Senator's question. I was speaking to satellites that might have been placed in orbit by another country that we did not have full intelligence about.

In respect to our own satellites, there certainly is a gray area. Some of them would be of minor military interest and some might be primarily of military interest. My concept is that you could distinguish perhaps the majority of them very clearly and the others would have to be by kind of an adjudication between the agencies.

Senator SYMINGTON. If that was the problem that we had, then that would also be a problem for, say, hundreds of orbiting units that another country might send up, would it not, as to whether they had a military significance or whether they had a peaceful significance?

Mr. QUARLES. I would think that we would always have some element of doubt about that; yes.

Senator SYMINGTON. And if you were wrong, then you might find yourself with a little problem on your hands, might you not?

Mr. QUARLES. I think we might very well find ourselves with a problem on our hands, although I would not expect that to be the kind of problem that would involve an actual attack with bombs, for example, against this country.

I do not think there is great danger of that kind of error, but there could be error as to whether they were or were not gathering, for example, military intelligence.

Senator SYMINGTON. I have discussed this with some rather eminent people in this field, and if there is anything written on that subject in the Department of Defense, Mr. Secretary, I would appreciate having it to contribute to my understanding on that particular point.

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Secretary MCELROY. We have another major area which is that of research and development. It is proposed here to substitute for the position of Assistant Secretary of Research and Engineering in the Department of Defense a new position, which is to be called Director of Defense Research and Engineering.

It is proposed that this individual be given a rank which just follows that of the service Secretaries and that he be compensated at the same rate as the service Secretaries which would be above that of the Assistant Secretaries of Defense.

This goes back to the frequently expressed importance before this committee of a unified supervision of research and development activities of all of the services and avoidance of overlapping and duplication. We think that with the very rapid advance of technology in this country, that this is needed not only now but will be increasingly needed in the future.

It is intended that this man's supervision will apply not only to the research programs of the services but also that of the Advanced Research Projects Agency and of the Director of Guided Missiles, so that the entire program of research and

development within the Department of Defense would come under this man's supervision.

It is also proposed, although this is not spelled out, that a certain amount of authority and maybe a considerable amount of authority over funding of these research and development programs should be granted to the Secretary of Defense who then would delegate it to this Director of Defense, Research and Engineering.

At the present time an amount of money in the range of approximately $5 billion is being spent on research and engineering in the Department of Defense, so I think it is quite obvious that this is a matter of importance not only in terms of economy but even more it is important that there be no impediment to rapid decisions being made in order to get a more rapid operational capability of the most modern weapons. It is the kind of thing that really I suspect this subcommittee first got to work to study the Defense Department for in connection with its work last fall.

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Senator BRIDGES. Let's examine appropriations and the power of the Congress for the moment. The power of the purse has always been a congressional asset, one of the few prerogatives we have up here.

In making appropriations under this proposal, you will no longer make them through the Army, the Navy, or the Air Force: is that correct?

Secretary MCELROY. It is proposed that they be made to the Secretary of Defense for research and development.

Senator BRIDGES. For various categories?

Secretary MCELROY. Well, I cannot conceive of their being appropriated for separate areas of Defense Department the amounts being indicated for Navy, for Army, for Air Force, for Advanced Research Projects Agency, and each one of those figures, as I would visualize it, would be supported by the individual service in the same way as it is done now.

I do not see this as involving any difference as far as budgeting is concerned or any defense of these budgets before the committees. The appropriation is proposed to be made to the Secretary of Defense as a means of establishing the fact of the singleness of the Department.

The delegation of that money would then be made as they feel necessary in research and engineering, to the Director of Defense Research and Engineering. We have in mind—and this might be worth a minute or two because it could be said to apply to other appropriations if we were discussing those. If there was any change made among these service amounts as indicated and supported before the Congress by this Director of Defense Research and Engineering, he would report this change to the appropriate committees of Congress, together with the reason for the changes.

That might or might not be regarded by the Congress as an adequate check on what changes might be made, but that is proposed as a means of their keeping in touch with what is going on.

Senator BRIDGES. Assuming Congress appropriated money to

buy 200 B-52 bombers, would you, under this proposal, have the power to use the money we appropriated for the B-52 bombers to buy some other type of armament?

Secretary McElroy. If the proposal which I would expect to come before the Congress from the President is implemented, yes, that then would be true. But this would involve a discussion, either before or after, with the committees involved, and I would be surprised if a discussion of that sort did not take place before the decision was made.

Senator Bridges. As you envision it, would it be absolutely necessary to come back to the Congress before you did that?

Secretary McElroy. No. It would be reported to the Congress, it would be reported immediately, and if the decision were regarded by the Congress as a wrong one, I cannot believe that it would be maintained.

Senator Bridges. This is pretty much of a surrender on the part of Congress if, after hearing and in good faith, we appropriate money for B-52 bombers only to have you divert it without coming back and getting the official approval of the Congress, before you shift it. When I talk about "you," I mean the Secretary of Defense.

Secretary McElroy. Yes. Let me say, Senator Bridges, I know this is a sensitive point. The President knows this is a sensitive point with the Congress, and I think he would be willing to rest this one on the basis that he would like to do whatever the Congress feels it is willing to do if it can accomplish what he considers desirable, which is to give a degree of flexibility to the Secretary of Defense in certain of this spending.

It needn't be, and I see no reason why it should go to a complete flexibility of the type you and I are discussing now.

I would think that it would be quite appropriate to put restrictions on the degree to which flexibility would be permitted, even under the basis of reporting that I have talked about. But, in my judgment, the President considers that this is something which he can work out, and let's say he and his representative in the Office of Defense can work out in discussion with the congressional committees involved, provided they have a belief that the objective he is after is one which is worth trying to accomplish.

Senator Bridges. Certainly under ideal conditions. But I have seen the time here when you could almost abolish the services by leaving that power in their hands. Well, I do not want to use any more time.

Secretary McElroy. I think that is a very important point. Senator Bridges, I am certain that this is a subject which will have quite a great deal of discussion, and should have.

Senator Bridges. I believe with give and take here, we could work out a common ground, but I want it clarified.

Secretary McElroy. There is nothing at all rigid in the point of view of either the President or ourselves on this matter.

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Senator Barrett. Mr. Secretary, with reference to this item of research and engineering, it seems to me after hearing the testi-

mony before this committee at the previous hearings that there was considerable complaint all through the services that there was so much redtape in getting decisions through the various departments, and that the lead time, roughly speaking, was twice as long in this country as it was in Russia, and something had to be done to correct that situation.

Now, the Director of Research and Engineering is in rank under the three Secretaries of the separate services and above the Assistant Secretaries of Defense.

It seems to me that the problem is mostly administrative, and you still have to go to the Bureau of the Budget. You have to go back and consult with all of these people in the Budget Office of the various branches of the services and you have to go through a myriad of people before you can come to a decision.

All of the testimony that I have heard and the discussions that I have had with top people throughout the country was that this was the main concern, that you couldn't get a decision made in a reasonable time.

It seems to me that is mostly administrative rather than involving the legislative branch. I would like to know just how this Director of Defense, Research and Engineering is going to expedite that under this new setup.

Secretary McElroy. If he has the degree of authority that the President is recommending for him, and that we endorse for him, he will be able to assign a particular research project to a service. He will first of all review all of the programs which are going on in the given service.

If there is any part of that which is being done on a duplicating basis in some other service, he will resolve the question of which one is to drop it and which one is to pursue it within the Department.

Senator Barrett. And he cuts right across to the Secretary of Defense instead of going through——

Secretary McElroy. Oh, yes, precisely. He does not go through anyone. He goes directly, he is directly responsible to the Deputy Secretary and the Secretary, the Deputy Secretary, and the Secretary being a single person under the concept we have.

Senator Barrett. Under this change, do you believe that we are going to cut out a lot of the redtape that has held up decisions for quite some time in these very vital and important matters?

Secretary McElroy. We think so, Senator Barrett. This isn't all we plan to do. We plan to do some things administratively in terms of chopping out some committees.

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Senator Barrett. Say, General Schriever, General Medaris or the Navy has got a peculiar problem that involves research. Do they have to go through their separate branches and get clearance before they can go to the Director of Research and Engineering to discuss this matter?

Secretary McElroy. That is correct.

Senator Barrett. They can bring the matter directly to them?

Secretary McElroy. They would have to go to their superiors because I think you could not operate except in that way. In the case of the Advanced Research Projects Agency——

Senator CASE. Will the Senator yield?

Senator BARRETT. I yield.

Senator CASE. Could we reverse that and say that General Medaris and General Schriever could go through their chain of command, but the Director of Research would not need to? He could go direct.

Secretary MCELROY. No; he would have to go through the chain of command. I don't think you can change that one, because after all you can't have somebody going over the head of a man's boss in order to give him orders.

Senator CASE. I don't think that, but something that you said earlier made me think that he would be able to operate directly.

Secretary MCELROY. No; we can't stand that.

Senator BARRETT. Mr. Secretary, I am a little disturbed about this because it seems to me then that various Secretaries are going to have the power to veto what the Director of Research and Engineering wants to do.

Secretary MCELROY. They won't have the power to veto, but any veto that he wants to exercise on his own or any instruction he wants to give, must go through a chain of command.

He will have under this concept supervision over service programs. You take Gen. Benny Schriever, for example. Benny goes through the ARDC, Air Force Research and Development Command, and that is Benny's boss. Now what would happen under this concept would be that the Director of Defense Research and Engineering would review, and I presume this would start with the budget-making process, would review the programs of research and development of the entire Air Force, and he would approve certain projects, some of which presumably then would go to Schriever.

If Schriever had any feeling about a need for improvement he would go to his boss, who would be the head of the Air Force Research and Development Command, and if they seemed to indicate some modification which was desirable, they would take it up with this Director of Defense Research and Engineering and work out the improvement, change, or whatever was required.

It could go the other way, too. This Director of Research and Engineering would also have his own advisers who would be reviewing programs, particularly the high-priority programs, and there would be nothing to keep those advisers from going into Schriever's shop, and if they found something that needed improvement, they would go then to the commanding general of the Air Force Research and Development Command with or without Schriever and work out the changes.

Senator BARRETT. That may be the saving grace of the whole works, because the Director would then have the right to cut right across directly to the place where the work is really done.

Secretary MCELROY. He certainly would. He would have his own team of advisers in each of a number of high-priority areas.

I don't see how he could work otherwise. And there would be no question about his authority to move into those areas for his own independent evaluation of what is going on.

My only point is that if he were to fix it, in fixing it he would have to go through the line of command.

Senator BARRETT. I agree with that, but I think that you probably have an arrangement whereby this program will be expedited and that is the main concern of all of us.

DEPARTMENT OF DEFENSE ANNOUNCEMENTS ON ARPA

On February 7, 1958, the Department of Defense issued the following news release:

Secretary of Defense Neil McElroy today established a new agency within the Department of Defense "for the direction and performance of certain advanced research and development projects." It will be called the Department of Defense Advanced Research Projects Agency and will report to the Secretary.

The Secretary at the same time announced the appointment of Roy W. Johnson, of New York, as Director of the new Agency. Johnson has been a vice president of General Electric since 1948, and in 1951 was made an executive vice president and group executive of the company.

Commenting on the appointment, Secretary McElroy said, "Roy Johnson will bring to this important assignment impressive experience and ability as an administrator. He was in charge of General Electric's electronics business for 6 years starting in 1951, is accustomed to working productively with scientific people, and knows organization thoroughly. In the new Agency he will be backed up by the most highly qualified scientist we can find as the head of the group that will provide technical direction to the programs assigned to the Agency."

Among his current public service activities, Johnson is president of the American Council To Improve Our Neighborhood (ACTION, Inc.), a program for urban renewal, and is the 1958 New York City chairman of the fund and membership drive of the American Red Cross. He was in Washington as a member of the War Production Board, 1942–44, the last few months as Director of the Facilities Bureau of that organization. A native of Michigan City, Ind., he graduated from the University of Michigan in 1927 and joined General Electric in 1930. He lives in Stamford, Conn., with his wife and daughter.

Johnson will resign from General Electric effective April 1, according to the announcement, but will spend 2 or 3 days a week on his new assignment prior to that date.

The concept behind the new Agency was given by Secretary McElroy in his statement before the House Committee on Appropriations, January 27, when he was discussing antimissile missiles and other space systems projects. "Such projects" he said, "do not fall clearly within the responsibility of any one of the military services. It is therefore entirely logical that research and development work on such projects be placed under centralized control and direction without regard to normal concepts of military roles and missions and assigned to one of the services only when they approach operational capability."

"It is contemplated," he said, "that programs assigned to the Agency will be developed in full coordination with the military

departments to the point where they are approaching operational capability so that they may be phased into the operation of one or more of the military services with no loss of time or interruption of development and production."

According to the Department of Defense directive issued today, "the Agency shall be responsible for the direction or performance of such advanced projects in the field of research and development as the Secretary of Defense shall from time to time designate, by individual project or by category."

The Agency is authorized to arrange for the performance of research and development work by other agencies of the Government, including the military departments; to enter into contracts and agreements with individuals, private business entities, educational, research or scientific institutions; and to "acquire or construct such research and development and test facilities and equipment as may be approved by the Secretary of Defense in accordance with applicable statutes."

An appropriation of $10 million for ARPA was included in the supplemental fiscal year 1958 appropriation bill recently passed by the Congress, as well as authority to transfer to the new Agency funds already appropriated for antimissile missile and space projects.[35]

Top appointments were announced for ARPA on March 5, 1958.

The Department of Defense announced today the selection of Rear Adm. John E. Clark, USN, until yesterday Director of the Navy's Guided Missiles Division, as Deputy Director of the Advanced Research Projects Agency. Admiral Clark was the choice of Roy W. Johnson, who was named Director of the Agency by Secretary of Defense Neil H. McElroy on February 7.

At the same time, two other selections to fill top posts in the new Agency were announced.

Lawrence P. Gise, former Assistant Director of the Division of Military Applications, Atomic Energy Commission, has been appointed Director, Program Control and Administration, ARPA. He will join ARPA on March 15.

Lambert L. Lind has been granted a year's leave of absence from Ebasco Services, New York, to accept the appointment as special assistant to the Director, ARPA. He will take over his duties on March 21.

Admiral Clark has extensive background in guided missile and gunnery fields. He was twice decorated for outstanding performance of duty in connection with gunnery operations in the Pacific during World War II. He was assigned to the Office of Secretary of Defense in 1952, where he had duty in connection with guided missiles. In 1954, he became commander, Naval Air Missile Test Center, Point Mugu, Calif. From this billet he was ordered to duty in the Guided Missile Division of the Office of Chief of Naval Operations, on November 18, 1955.

Rear Adm. K. S. Masterson, USN, who has been serving in the Office of the Director of the Guided Missiles Division has relieved Admiral Clark.[36]

[35] Department of Defense, Office of Public Information. News release No. 109-58, February 7, 1958.
[36] Department of Defense, Office of Public Information. News release No. 197-58, March 5, 1958.

On March 27, 1958, new space programs were announced by the Department of Defense:

> Secretary of Defense McElroy announced today that, with the approval of the President, the Advanced Research Projects Agency of the Department of Defense will proceed with several programs for launching a number of small unmanned space vehicles. Roy W. Johnson, Director of ARPA, is issuing instructions to agencies of the three military services to undertake these programs for ARPA.
>
> The programs authorized include both scientific earth satellites and efforts to determine our capability of exploring space in the vicinity of the moon, to obtain useful data concerning the moon, and provide a close look at the moon. In technical terms, these programs are called lunar probes.
>
> Authority to undertake 1, and possibly 2, lunar probes was given the Army Ballistic Missile Agency at Huntsville, Ala. ABMA was also authorized to launch 2, and possibly 3, earth satellites. Modified Jupiter-C rockets will be used in these projects.
>
> A program calling for three lunar probes was assigned to the Air Force Ballistic Missile Division, ARDC, Los Angeles, Calif. BMD will use a Thor-Vanguard system with a third stage to be developed.
>
> Meanwhile the naval ordnance test station at Inyokern, Calif., was ordered to develop a mechanical ground scanning system for use, when available, in lunar probes.
>
> An initial allocation of some $8 million to begin work on these projects has already been made by ARPA to the agencies concerned.
>
> "We would prefer to announce these programs when we are sure of success rather than merely announcing that the work has been authorized," Mr. Johnson said today.
>
> "However, public interest in knowing more about the country's programs in space exploration is so high that it was decided to release this information and, at the same time, advise the public that it is impossible to put a timetable on successful accomplishment of these efforts.
>
> Mr. Johnson said neither he nor other officials of the Department of Defense would speculate on when the first successful lunar probe would be achieved, nor would he give additional information on instrumentation of the probes themselves.
>
> Dr. Herbert F. York, chief scientist of ARPA, explained that this work is highly experimental. "Many test rocket launchings will probably be required before a probe is successfully placed in the vicinity of the moon," he said. "During the past several months much groundwork has been done on these projects. Scientists in these three military agencies thus are not starting from scratch."
>
> Dr. York, also a member of the President's Scientific Advisory Committee headed by Dr. James R. Killian, said that these programs will be coordinated with the National Advisory Committee for Aeronautics, the National Academy of Sciences, and the National Science Foundation.[37]

[37] Department of Defense, Office of Public Information. News release No. 288-58, March 27, 1958.

THE PRESIDENT OF THE UNITED STATES

Messages Relating to Space Science and Exploration and a Bill To Provide for Research Into Problems of Flight

1. STATE OF THE UNION ADDRESS EXCERPT ON ADVANCED RESEARCH

In the President's state of the Union address of January 9, 1958, he stated:

> In recognition of the need for single control in some of our most advanced development projects, the Secretary of Defense has already decided to concentrate into one organization all the antimissile and satellite technology undertaken within the Department of Defense.
>
> * * * * *
>
> We must be forward looking in our research and development to anticipate and achieve the unimagined weapons of the future (H. Doc. No. 251).

2. BUDGET MESSAGE

In presenting the budget for the fiscal year 1959 on January 13, 1958, the President discussed research and development, and various scientific programs. With regard to satellite programs, the President said:

> Funds are provided for an expanded research and development effort on military satellites and other outer space vehicles, and on antimissile missile systems, to be carried out directly under the Secretary of Defense. An increase is also included for basic and applied research in other areas (H. Doc. No. 266).

On April 2, 1958, the President sent to the Congress a message relative to space science and exploration which was referred to the House Select Committee on Astronautics and Space Exploration and the Senate Special Committee on Space and Astronautics. A draft of a bill to provide for research into problems of flight within and outside the earth's atmosphere and a statement of estimated man-years and maximum additional expenditures in compliance with Public Law 801 was also sent from the Bureau of the Budget. In addition, there was a portion of the President's recommendations relative to our entire Defense Establishment which related to the Advanced Research Projects Agency.

3. PRESIDENT'S MESSAGE OF APRIL 2, 1958, ON SPACE SCIENCE AND EXPLORATION

To the Congress of the United States:

Recent developments in long-range rockets for military purposes have for the first time provided man with new machinery

so powerful that it can put satellites into orbit, and eventually provide the means for space exploration. The United States of America and the Union of Soviet Socialist Republics have already successfully placed in orbit a number of earth satellites. In fact, it is now within the means of any technologically advanced nation to embark upon practicable programs for exploring outer space. The early enactment of appropriate legislation will help assure that the United States takes full advantage of the knowledge of its scientists, the skill of its engineers and technicians, and the resourcefulness of its industry in meeting the challenges of the space age.

During the past several months my Special Assistant for Science and Technology and the President's Science Advisory Committee, of which he is the Chairman, have been conducting a study of the purposes to be served by a national space program, of the types of projects which will be involved, and of the problems of organizing for space science functions. In a statement which I released on March 26, 1958, the Science Advisory Committee has listed four factors which in its judgment give urgency and inevitability to advancement in space technology. These factors are (1) the compelling urge of man to explore the unknown; (2) the need to assure that full advantage is taken of the military potential of space; (3) the effect on national prestige of accomplishment in space science and exploration; and (4) the opportunities for scientific observation and experimentation which will add to our knowledge of the earth, the solar system, and the universe.

These factors have such a direct bearing on the future progress as well as on the security of our Nation that an imaginative and well-conceived space program must be given high priority and a sound organization provided to carry it out. Such a program and the organization which I recommend should contribute to (1) the expansion of human knowledge of outer space and the use of space technology for scientific inquiry, (2) the improvement of the usefulness and efficiency of aircraft, (3) the development of vehicles capable of carrying instruments, equipment, and living organisms into space, (4) the preservation of the role of the United States as a leader in aeronautical and space science and technology, (5) the making available of discoveries of military value to agencies directly concerned with national security, (6) the promotion of cooperation with other nations in space science and technology, and (7) assuring the most effective utilization of the scientific and engineering resources of the United States and the avoidance of duplication of facilities and equipment.

I recommend that aeronautical and space science activities sponsored by the United States be conducted under the direction of a civilian agency, except for those projects primarily associated with military requirements. I have reached this conclusion because space exploration holds promise of adding importantly to our knowledge of the earth, the solar system, and the universe, and because it is of great importance to have the fullest cooperation of the scientific community at home and abroad in moving forward in the fields of space science and technology. Moreover,

a civilian setting for the administration of space function will emphasize the concern of our Nation that outer space be devoted to peaceful and scientific purposes.

I am, therefore, recommending that the responsibility for administering the civilian space science and exploration program be lodged in a new National Aeronautics and Space Agency, into which the National Advisory Committee for Aeronautics would be absorbed. Hence, in addition to directing the Nation's civilian space program, the new Agency would continue to perform the important aeronautical research functions presently carried on by the National Advisory Committee for Aeronautics. The new Agency would be headed by a Director appointed by the President by and with the advice and consent of the Senate.

In order to assist the President and the Director of the National Aeronautics and Space Agency, I recommend that a National Aeronautics and Space Board, appointed by the President, be created. Several of the members of the Board should be from the Government agencies with the most direct interest in aeronautics, space science, and space technology. To assure that military factors are considered by the Board, at least one member should be appointed from the Department of Defense. Members appointed from outside the Government should be eminent in science, engineering, technology, education or public affairs and be selected solely because they have established records of distinguished achievement.

The National Aeronautics and Space Agency should be given that authority which it will need to administer successfully the new programs under conditions that cannot now be fully foreseen.

In order that the Agency may attract and retain the services of scientists and technicians which it must have to carry out its responsibilities with full effectiveness, it should have the authority, subject to regulations prescribed by the President, to fix the compensation of its employees at rates reasonably competitive with those paid by other employers for comparable work without regard to the provisions of existing classification laws.

The Agency should have the power to conduct research projects in its own facilities or by contract with other qualified organizations. It will thus be free to enlist the skills and resources required for the space program wherever they may be found, and to do so under the arrangements most satisfactory to all concerned. Provision should also be made for continuing and further enhancing the close and effective cooperation with the military departments which has characterized the work of the National Advisory Committee for Aeronautics. Under such cooperative arrangements it is expected that the National Aeronautics and Space Agency will perform research required in the furtherance of strictly military aeronautics and space objectives, just as the National Advisory Committee for Aeronautics now carries on important research work for the military services in aerodynamics, propulsion, materials and other fields important to the development of military aircraft and missiles.

The National Advisory Committee for Aeronautics is already engaged in research directly related to flight outside the earth's

atmosphere and has research facilities adapted to work in space science. Upon the enactment of legislation carrying out my recommendations, all of the resources of the National Advisory Committee for Aeronautics would immediately come under the direction of the new Agency. The Department of Defense and its contractors, as well as other agencies, have active programs which should be considered for administration by the National Aeronautics and Space Agency. I recommend that this fact be taken into account and provision made for the transfer to the Agency of such functions, activities, and facilities of other departments and agencies as may be found to be appropriate for administration by the new Agency, subject to the concurrence of the heads of the affected agencies and with the approval of the President.

The Director of the Bureau of the Budget is transmitting to the Congress draft legislation to establish the National Aeronautics and Space Agency and to authorize research into the problems of flight within and outside the earth's atmosphere. I urge that the Congress give prompt consideration to the draft legislation and that it be enacted at the earliest possible date.

Pending enactment of legislation, it is essential that necessary work relating to space programs be continued without loss of momentum. For this reason, I have approved, as part of an interim program of space technology and exploration, the launching of a number of unmanned space vehicles under the direction of the Advanced Research Projects Agency of the Department of Defense. The projects which I have approved include both scientific earth satellites and programs to explore space. In taking this interim action, I directed the Department of Defense to coordinate these projects with the National Advisory Committee for Aeronautics, the National Science Foundation, and the National Academy of Sciences. I also indicated that when a civilian space agency is created, these projects would be reviewed to determine which should continue under the direction of the Department of Defense and which should be placed under the new Agency.

It is also important that measures be taken to assure the prompt and orderly implementation of the proposed aeronautics and space legislation when enacted.

I am requesting the Department of Defense and the National Advisory Committee for Aeronautics to review pertinent programs of the Department and to recommend to me those which should be placed under the direction of the new Agency. I have also asked that they prepare an operating plan to assure support of the new Agency by organizations, facilities, and other resources of the Department of Defense, either by cooperative arrangements or by transfer to the new Agency.

It is contemplated that the Department of Defense will continue to be responsible for space activities peculiar to or primarily associated with military weapons systems or military operations. Responsibility for other programs is to be assumed by the new Agency. In this connection, I commend to the attention of the Congress the comments of my Science Advisory Committee, in

its statement of March 26, 1958, on the military applications of space technology.

I am also asking the National Advisory Committee for Aeronautics to begin immediate preparation of such detailed plans as may be required to prepare for the assumption by the National Aeronautics and Space Agency of the responsibilities contemplated for it. Those plans are to set forth the specific new space programs to be initiated and are to describe the internal organization, management structure, staff, facilities, and funds which will be required. The National Advisory Committee for Aeronautics is to discuss with the National Science Foundation and the National Academy of Sciences the matter of participation by the scientific community in determining the scientific objectives of our space programs. The best scientific judgment available should be utilized. Matters related to dissemination of the data collected should also be considered.

I have also instructed the National Advisory Committee for Aeronautics to assume the responsibility for preparing and presenting to the appropriate committees of the Congress a full explanation of the proposed legislation and its objectives.

The vigorous program contemplated will depend not only on adequate legislative authority but also on adequate financial support. I shall shortly submit to the Congress an amendment to the fiscal year 1959 budget to provide funds that will be needed by the new Agency in its first year of operation.

DWIGHT D. EISENHOWER.

THE WHITE HOUSE,
April 2, 1958.[38]

4. LETTER FROM THE DIRECTOR OF THE BUREAU OF THE BUDGET TO THE PRESIDENT OF THE SENATE

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington, D. C., April 2, 1958.

Hon. RICHARD M. NIXON,
President of the Senate,
Washington, D. C.

MY DEAR MR. PRESIDENT: I transmit herewith, for the consideration of the Congress, a draft bill to provide for research into problems of flight within and outside the earth's atmosphere and for other purposes.

The objectives and principal provisions of the proposed legislation have been described by the President in his message transmitted to the Congress on April 2, 1958. In that message the President recommends the establishment of a National Aeronautics and Space Agency. He also states that the early enactment of appropriate legislation will help assure that the United States takes full advantage of the knowledge of its scientists, the skill of its engineers and technicians, and the resourcefulness of its industry in meeting the challenges of the space age.

[38] H. Doc. No. 365, 85th Cong., 2d sess.

In accordance with Public Law 801 of the 84th Congress, there is enclosed a statement of the estimated maximum man-years of employment and additional expenditures for each of the first 5 fiscal years of operations under the proposed legislation. Requests for appropriations in support of programs authorized by this legislation will be based on a more comprehensive review of funding requirements and availability than has been possible to date.

Sincerely yours,

MAURICE H. STANS, *Director*

5. S. 3609, A BILL WHICH EMBODIES THE RECOMMENDATIONS IN THE PRESIDENT'S MESSAGE ON OUTER SPACE

A BILL to provide for research into problems of flight within and outside the earth's atmosphere, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Aeronautics and Space Act of 1958."

DECLARATION OF POLICY

SEC. 2. The Congress hereby declares that the general welfare and security of the United States require that adequate provision be made for research into, and the solution of, problems of flight within and outside the earth's atmosphere and that provision also be made for the development, testing, and operation for research purposes of aircraft, missiles, satellites and other space vehicles, manned and unmanned, together with associated equipment and devices. The Congress further declares that such activities should be directed by a civilian agency exercising control over aeronautical and space research sponsored by the United States, *except* insofar as such activities may be peculiar to or primarily associated with weapons systems or military operations, in which case the agency may act in cooperation with, or on behalf of, the Department of Defense. These activities should be conducted so as to contribute materially to one or more of the following policy objectives: (1) the expansion of human knowledge of phenomena in the atmosphere and space, (2) the improvement of the usefulness, performance, safety, and efficiency of aircraft, (3) the development and operation of vehicles capable of carrying instruments, equipment, and living organisms through space, (4) the preservation of the role of the United States as a leader in aeronautical and space science and technology, (5) the making available to agencies directly concerned with national defense of discoveries that have military value or significance, (6) cooperation by the United States with other nations and groups of nations in work done pursuant to this Act and in the peaceful application of the results thereof, and (7) the most effective utilization of the scientific and engineering resources of the United States and the avoidance of duplication of facilities and equipment.

NATIONAL AERONAUTICS AND SPACE AGENCY

SEC. 3. There is hereby established the National Aeronautics and Space Agency, hereinafter called the "Agency." The Agency shall be headed by a Director who shall be appointed by the President by and with the advice and consent of the Senate, shall receive compensation at the rate of $22,500 per annum, and, except as otherwise provided in this Act, shall exercise the functions of the Agency. The Director may from time to time make such provisions as he may deem appropriate authorizing the performancec by any officer, employee, or administrative unit under his jurisdiction of any of his functions under this Act.

NATIONAL AERONAUTICS AND SPACE BOARD

SEC. 4. (a) There is hereby established the National Aeronautics and Space Board, hereinafter called the "Board," which shall be composed of not to exceed 17 members appointed by the President.

(1) No more than eight of the members of the Board shall be designated from appropriate departments or agencies of the Government of the United States, including at least one who shall be from the Department of Defense.

(2) Members of the Board other than those appointed under subsection (a) (1) of this section shall be eminent in science, engineering, technology, education, or public affairs and shall be selected solely on the basis of established records of distinguished achievement, and shall be appointed for terms of four years from the date of expiration of the terms of the members whom they succeed, except that in making initial appointments of such members the President may make appointments for such shorter terms as he deems appropriate.

(b) The Chairman of the Board shall be designated from time to time by the President from among the members appointed under subsection (a) (2) of this section. Such members shall be paid travel expenses and per diem in accordance with the provisions relating to persons serving without compensation under section 5 of the Administrative Expenses Act of 1946, as amended (5 U. S. C. 73 b-2).

FUNCTIONS OF THE BOARD

SEC. 5. (a) The Board shall meet at least four times each year and shall advise the President and the Director concerning policies and programs of the Agency. The Board shall make an annual report and from time to time such other reports to the President as it deems appropriate.

(b) The Board may make recommendations to the President with respect to the appointment of the Director, and the Director shall not be appointed until the Board shall have had a reasonable opportunity to make such recommendations.

(c) The Board shall be consulted by the Director prior to—

(1) Initiation or substantial modification of policies or programs of the Agency;

(2) Transmittal of any request for appropriations to the Bureau of the Budget pursuant to the Budget and Accounting Act, 1921, as amended (31 U. S. C. 1 et seq.);

(3) Establishment of major constituent organizational units of the Agency, and the assignment of major functions or groups of functions thereto; and

(4) Appointment by the Director of the heads of major constituent units.

FUNCTIONS OF THE AGENCY

SEC. 6. (a) The Agency shall—

(1) Develop a comprehensive program of research in the aeronautical and space sciences;

(2) Plan, direct, and conduct scientific studies and investigations of the problems of manned or unmanned flight within or outside the earth's atmosphere with a view to their practical solution;

(3) Develop, test, launch, and operate aeronautical and space vehicles;

(4) Arrange for participation by the scientific community in planning scientific measurements and observations to be made through use of aeronautical and space vehicles, and conduct or arrange for the conduct of such measurements and observations; and provide as appropriate for dissemination of data collected; and

(5) Submit to the President for transmittal to the Congress an annual report of operations and accomplishments.

(b) In performance of the above functions the Agency is authorized—

(1) To make, promulgate, issue, rescind, and amend rules and regulations governing the manner of its operations and the exercise of the powers vested in it by law;

(2) Subject to the civil-service laws, to select, appoint, employ, and, subject to such regulations as the President may prescribe and without regard to the Classification Act of 1949, as amended (5 U. S. C. 1072 et seq.), and the Federal Employees Pay Act of 1945, as amended (5 U. S. C. 901 et seq.) fix and adjust, as nearly as consistent with the public interest and on the basis of equal pay for equal work at rates which are reasonably comparable with prevailing rates paid by non-Federal employers for similar work, compensation of, such officers and employees as may be necessary to carry out the provisions of this Act;

(3) To acquire, construct, improve, repair, operate, and maintain laboratories, research and testing sites and facilities, manned and unmanned aeronautical and space vehicles, quarters and related accommodations for employees and dependents of employees of the Agency, and such other real and personal property, or any interest therein, as the Agency deems necessary within and outside the continental United States; to lease to others such real and personal property; to sell and otherwise dispose of real and personal property

in accordance with the provisions of the Federal Property and Administrative Services Act of 1949, as amended (40 U. S. C. 471 et seq.); and to provide by contract or otherwise for cafeterias at its installations and to purchase and maintain equipment therefor; the receipts therefrom shall be deposited to a special fund in the Treasury which shall remain available for obligation and expenditure in connection with such operations and purchase and maintenance of equipment;

(4) To accept gifts or donations of services, money, or property, real personal or mixed, tangible or intangible, and to make grants to further the authorized purposes of the Act;

(5) Without regard to section 3648 of the Revised Statutes, as amended (31 U. S. C. 529), to enter into and perform such contracts, leases, cooperative agreements, or other transactions as may be necessary in the conduct of its work and on such terms as it may deem appropriate, with any agency or instrumentality of the United States, or with any State, Territory or possession, or with any political subdivision thereof, or with any person, firm, association, corporation, or educational institution;

(6) To use with their consent the services, equipment, personnel, and facilities of Federal and other agencies with or without reimbursement and on a similar basis to cooperate with other public and private agencies and instrumentalities in the use of the services, equipment and facilities of the Agency. In addition to authority to use provided by this subsection and, notwithstanding any other provision of law, any governmental agency or component thereof is authorized to transfer to the Agency without reimbursement supplies, equipment, aircraft, missiles, space vehicles, and related parts other than administrative supplies or equipment;

(7) To appoint such advisory committees as may be appropriate for purposes of consultation and advice to the Agency in performance of its functions;

(8) To obtain services as authorized by section 15 of the Act of August 2, 1946 (5 U. S. C. 55a) at rates not to exceed $100 per diem;

(9) When determined by the Director to be necessary and subject to such security investigations as he may determine to be appropriate, to employ aliens without regard to statutory provisions prohibiting payment of compensation to aliens;

(10) To employ and compensate retired commissioned officers of the United States at the rate established for the positions so occupied by them within the Agency, less the amount of their retired pay: *Provided*, That, when the retired pay amounts to or exceeds the rate of compensation established for the position occupied, such person shall be entitled to the pay of the Agency position, or the retired pay, whichever he may elect;

(11) With the approval of the President, to enter into cooperative agreements under which members of the Army

Navy, Air Force, and Marine Corps may be detailed by the appropriate Secretary for services in performance of functions under this Act to the same extent to which they might be lawfully assigned in the Department of Defense;

(12) To the extent the Director finds it will contribute to achievement of the objectives of this Act or to the more effective functioning of the Agency, to conduct or provide training and to assign employees to research, study or training at Federal or non-Federal facilities, including public or private agencies, institutions of learning, laboratories, industrial or commercial organizations or other appropriate organizations or institutions, foreign or domestic, and, if the Director deems it appropriate, to pay in whole or in part, the following: the salaries of such employees for the periods of such training or assignments; the cost of their transportation and per diem in lieu of subsistence in accordance with the Travel Expenses Act of 1949, as amended (5 U. S. C. 834 et seq.); necessary expenses incident to their training or assignment, including tuition, fees, study materials; and other customary expenses. The Agency shall require any employee who accepts such a leave or assignment to agree in writing to return to and, unless involuntarily separated therefrom, to remain in the service of the Agency for a period equal to three times the length of any time off with pay granted such employee without charge to annual leave for the purpose of such training or assignment. Any employee who fails to fulfill such agreement shall be required to reimburse the Government for whatever portion the Director determines to be equitable of the transportation, per diem in lieu of subsistence, and other expenses incident to such training or assignment paid by the Government. To the extent authorized by the Director, contributions may be made by private sources and accepted by employees receiving training in non-Federal facilities without regard to the provisions of section 1914 of title 18 of the United States Code;

(13) To authorize employees to attend meetings concerned with functions or activities of the Agency including improved conduct, supervision, or management of such functions or activities, and to pay the whole or any part of the expenses of such attendance;

(14) (a) To consider, ascertain, adjust, determine, settle, and pay, on behalf of the United States, any claim for money damage of $5,000 or less against the United States for bodily injury, death, or damage to or loss of real or personal property resulting from the conduct of the Agency's functions as specified in subsections 6 (a) (2), (3), and (4), where such claim is presented to the Agency in writing within two years after the accident or incident out of which the claim arises.

(b) If the Agency considers that a claim in excess of $5,000 is meritorious and would otherwise be covered by this subsection it may pay the claimant $5,000 and report the excess to Congress for its consideration.

(c) Except as provided in (b) of this subsection, no claim may be paid under this section unless the amount tendered is accepted by the claimant in full satisfaction.

(15) To arrange with the Civil Service Commission for the conduct of appropriate security or other personnel investigations of employees of the Agency, contractors and subcontractors, and their employees, as the Director deems necessary in the conduct of official functions of the Agency: *Provided*, That in the event an investigation made under this authority develops any data reflecting that the individual who is subject of the investigation is of questionable loyalty, the matter shall be referred to the Federal Bureau of Investigation for the conduct of a full field investigation, the results of which will be furnished to the Agency;

(16) To direct such of its officers and employees as it deems necessary in the public interest to carry firearms while in the conduct of their official duties. The Agency may also authorize such of those employees of its contractors engaged in the protection of property owned by the United States and located at facilities owned by or contracted to the United States, as it deems necessary in the public interest, to carry firearms while in the conduct of their official duties.

SECURITY

SEC. 7. (a) The Atomic Energy Commission may authorize any of its employees, or employees of any contractor, prospective contractor, licensee or prospective licensee of the Atomic Energy Commission or any other person authorized access to Restricted Data by the Atomic Energy Commission under subsection 145b of the Atomic Energy Act of 1954, as amended (42 U. S. C. 2163), to permit any member of the Board or an advisory committee, or any officer, employee, contractor, or employee of a contractor of the Agency to have access to restricted data required in the performance of his duties and so certified by the Director: *Provided, however*, That the Director or his designee has determined, in accordance with the established personnel security procedures and standards of the Agency, that permitting the member of the Board or an advisory committee, or employee, contractor, or employee of a contractor to have access to such Restricted Data will not endanger the common defense and security: *And provided further*, That the Director finds that the established personnel and other security procedures and standards of the Agency are adequate and in reasonable conformity to the standards established by the Atomic Energy Commission under section 145 of the Atomic Energy Act of 1954, as amended (42 U. S. C. 2165).

(b) Whoever willfully shall violate, attempt to violate, or conspire to violate any regulation or order as shall be promulgated by the Director for the protection or security of any laboratory, station, base or other facility, or part thereof, or any aircraft, missile, spacecraft or similar vehicle existing, or later conceived, or part thereof, or other property or equipment in the custody of the Agency shall be guilty of a misdemeanor and upon conviction thereof shall be liable to a fine of not to exceed

$5,000, or to imprisonment of not more than one year, or both, except that whoever commits such an offense with intent to injure the United States or with intent to secure an advantage to any foreign nation, shall, upon conviction thereof be punished by a fine of not more than $20,000 or by imprisonment for not more than 20 years or both.

(c) Section 1114 of title 18, United States Code, is hereby amended by striking out "or any officer or employee of the Indian field service of the United States," and inserting in lieu thereof "any officer or employee of the Indian field service of the United States, or any officer or employee of the National Aeronautics and Space Agency directed to guard and protect property of the United States under administration and control of the National Aeronautics and Space Agency,".

TRANSFER OF RELATED FUNCTIONS

SEC. 8. For a period of three years after the effective date of this Act the Agency, with the concurrence of the head of the department or agency concerned and with the approval of the President, may transfer to itself any functions (including powers, duties, activities, facilities, and parts of functions) of such department or agency or of any officer or organizational entity thereof which relate primarily to the functions of the Agency as set forth in section 6 hereof. In connection with any such transfer the President may, under authority of this section or under other applicable authority, provide for appropriate transfers of records, property, civilian personnel, and funds.

APPROPRIATIONS

SEC. 9. (a) There are hereby authorized to be appropriated without fiscal year limitation such sums as may be necessary and appropriate for the carrying out of the provisions and purposes of this Act.

(b) Any funds appropriated for the construction of facilities may be used for emergency repairs of existing facilities when such existing facilities are made inoperative by major breakdown, accident or other circumstances and such repairs are deemed by the Director of the Agency to be of greater urgency than the construction of new facilities.

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

SEC. 10. (a) The National Advisory Committee for Aeronautics on the effective date of this Act shall cease to exist as such and all real and personal property, personnel, funds, and records of that organization are hereby transferred to the Agency. The Agency shall wind up any outstanding affairs of the National Advisory Committee for Aeronautics not otherwise provided for in this Act. Except as otherwise directed by the President, the members of the National Advisory Committee for Aeronautics shall serve as the members of the National Aeronautics and Space Board until their successors are appointed by the President as provided in section 4 of this Act.

(b) Section 2302 of title 10 of the United States Code is amended by deleting the phrase "or the Executive Secretary of the National Advisory Committee for Aeronautics." and by inserting in lieu thereof the phrase "or the Director of the National Aeronautics and Space Agency."; and, section 2303 of said title 10 is amended by deleting the phrase "The National Advisory Committee for Aeronautics." and by inserting in lieu thereof the phrase "The National Aeronautics and Space Agency."

(c) Section 1 of the Act of August 26, 1950 (5 U. S. C. 22–1), is amended by deleting the phrase "National Advisory Committee for Aeronautics" wherever it appears and by inserting in lieu of the deleted words, in each instance, the phrase "National Aeronautics and Space Agency".

(d) The Unitary Wind Tunnel Plan Act of 1949 (50 U. S. C. 511) is amended by deleting the phrase "The National Advisory Committee for Aeronautics (hereinafter referred to as the 'Committee')" and by inserting in lieu thereof the phrase "The National Aeronautics and Space Agency (hereinafter referred to as the 'Agency')" and is further amended by deleting the word "Committee" wherever it appears and by inserting in lieu thereof, in each instance, the word "Agency".

6. NATIONAL AERONAUTICS AND SPACE AGENCY

Statement of estimated man-years and maximum additional expenditures in compliance with Public Law 801

[Dollar amounts in millions]

	Fiscal year 1959		Fiscal year 1960		Fiscal year 1961		Fiscal year 1962		Fiscal year 1963	
	Man-years	Personnel cost	Man-years	Personnel cost	Man-years	Personnel cost	Man-years	Personnel cost	Man-years	Personnel cost
General personnel categories.										
Executive direction	8	$0.12	12	$0.18	16	$0.24	20	$0.30	20	$0.30
Administrative and clerical	100	.55	120	.63	160	.88	200	1.10	200	1.10
Scientific, technical, and logistic support	892	5.83	1,068	7.69	1,424	9.88	1,780	13.60	1,780	13.60
Total, additional man-years and related expenditures	1,000	6.50	1,200	8.50	1,600	11.00	2,000	15.00	2,000	15.00
Total, expenditures other than for personal services	.....	93.50	.....	191.50	.....	239.00	.....	285.00	.....	285.00
Grand total, maximum additional expenditures	.....	100.00	.....	200.00	.....	250.00	.....	300.00	.....	300.00

6. On April 2, 1958, the President transmitted a communication to the Congress on amendments to the budget for the fiscal year 1959, involving increases in the amount of $1,455,747,000 for the Department of Defense--military functions (H. Doc. No. 364).

Department of Defense—Military functions

Budget page	Heading	Original estimate	Change to—	Increase
	OFFICE OF THE SECRETARY OF DEFENSE			
443	ADVANCED RESEARCH PROJECTS AGENCY			
	Salaries and expenses	$340,000,000		
	(Delete this heading and the paragraph thereunder and substitute the following:)			
	ADVANCED RESEARCH PROJECTS			
	Salaries and expenses		$520,000,000	$180,000,000
	[The Secretary of Defense is authorized to transfer not exceeding $40,000,000, to remain available until expended, from any appropriation available to the Department of Defense for the current fiscal year] *For expenses necessary* for such advanced research projects as [he] may [designate] *be designated* and [determine] *determined by the Secretary of Defense, $520,000,000, to remain available until expended: Provided*, That such amounts as may be determined by the Secretary of Defense to have been made available for related programs in other appropriations available to the Department of Defense during the current fiscal year may be transferred to and merged with this appropriation to be available for the same purposes and time period: *Provided further*, That such amounts of this appropriation as may be determined by the Secretary of Defense may be transferred to carry out the purposes of advanced research to those appropriations for military functions under the Department of Defense which are being utilized for related programs, to be merged with and to be available for the same time period as the appropriation to which transferred.			
	DEPARTMENT OF THE ARMY			
435	Research and development	471,000,000	498,700,000	27,700,000
436	Procurement of equipment and missiles	1,405,000,000	1,623,100,000	218,100,000
	DEPARTMENT OF THE NAVY			
473–474	Aircraft and related procurement	2,069,105,000	2,092,595,000	23,490,000
475	Aircraft and facilities	840,548,000	844,008,000	3,460,000
476	Shipbuilding and conversion	1,381,000,000	1,587,800,000	206,800,000
476	Ships and facilities	789,298,000	790,798,000	1,500,000
476–477	Ships and facilities	460,235,000	563,835,000	103,600,000
478	Procurement of ordnance and ammunition	641,043,000	750,083,000	109,040,000
481	Research and development	113,247,000	118,214,000	4,967,000
483	Servicewide operations			
	DEPARTMENT OF THE AIR FORCE			
496	Aircraft and missile procurement	5,998,800,000	6,407,200,000	518,400,000
498	Aircraft and missile support	2,146,000,000	2,195,700,000	49,700,000
500	Research and development	719,000,000	728,000,000	9,000,000

7. EXCERPT RELATING TO ARPA IN THE PRESIDENT'S MESSAGE OF APRIL 3, 1958, ON RECOMMENDATIONS RELATIVE TO OUR ENTIRE DEFENSE ESTABLISHMENT

Later in this message I will recommend measures to strengthen the authority of the Secretary of Defense to administer other functions of his Department. Referring at this point only to research and development, I consider it essential that the Secretary's control over organization and funds be made complete and unchallengeable. Only if this is done can he assure the most effective and economical use of the research and development resources of his Department. These processes are costly in money and skilled personnel; duplications are therefore doubly damaging.

The Secretary must have full authority to prevent unwise service competition in this critical area. He needs authority to centralize, to the extent as he deems necessary, selected research

and development projects under his direct control in organizations that may be outside the military departments and to continue other activities within the military departments. I anticipate that most research activities already under way would continue within the military departments. Such new undertakings as require central direction can be centralized with far less difficulty than projects already assigned to military departments.

To give the Secretary of Defense the caliber of assistance he requires in the research area, I recommend that the new position of Director of Defense Research and Engineering be established in place of the Assistant Secretary of Defense for Research and Engineering. I believe his salary should be equal to that of the Secretaries of the military departments. He should rank immediately after the service Secretaries and above the Defense Assistant Secretaries. As the principal assistant to the Secretary of Defense for research and development, he should be known nationally as a leader in science and technology. I expect his staff, civilian and military, also to be highly qualified in science and technology.

This official will have three principal functions: First, to be the principal adviser to the Secretary of Defense on scientific and technical matters; second, to supervise all research and engineering activities in the Department of Defense, including those of the Advanced Research Projects Agency and of the Office of the Director of Guided Missiles; and, third, to direct research and engineering activities that require centralized management.

Further, it will be his responsibility to plan research and development to meet the requirements of our national military objectives instead of the more limited requirements of each of the military services. It is of transcendent importance that each of our principal military objectives has strong and clearly focussed scientific and technical support.

With the approval of the Secretary of Defense, this official will eliminate unpromising or unnecessarily duplicative programs, and release promising ones for development or production. An especially important duty will be to analyze the technical programs of the military departments to make sure that an integrated research and development program exists to cover the need of each of the operational commands. It will be his responsibility to initiate projects to see that such gaps as may exist are filled. In addition, the Director will review assignments by the military departments to technical branches, bureaus, and laboratories to assure that the research and engineering activities of the Defense Department are efficiently managed and properly coordinated.

I would charge the Director, under the direction of the Secretary of Defense, with seeing that unnecessary delays in the decision-making process are eliminated, that lead times are shortened, and that a steady flow of funds to approved programs is assured. Only under this kind of expert, single direction can the entire research and engineering effort be substantially improved. In these various ways, he should help stop the service rivalries and self-serving publicity in this area.[39]

[39] H. Doc. No. 366, 85th Cong., 2d sess., pp. 9-10.

EXCERPTS FROM THE CONGRESSIONAL RECORD FOR THE 85TH CONGRESS, 2D SESSION, THROUGH APRIL 14, 1958, PERTAINING PRIMARILY TO OUTER SPACE

HOUSE OF REPRESENTATIVES

[Congressional Record, January 8, 1958]

JOINT CONGRESSIONAL COMMITTEE ON OUTER SPACE

Mr. KEATING. Mr. Speaker, I have today introduced a bill to establish a Joint Congressional Committee on Outer Space.

This joint committee, modeled closely along the lines of the Joint Committee on Atomic Energy, would be composed of nine Members of each House. No more than five from each House could be of the same political party. Like the Atomic Energy Committee, the chairmanship would alternate between the House and Senate with each Congress.

The outer space group would be authorized to make "continuing studies of the use and control of outer space." Specifically it would be authorized to oversee the following five areas:

First. The research, development, production, and other activities of any department or agency of the Government, or of any private agency, conducting activities relating to outer space, including such activities relating to rockets, missiles, and earth satellites.

Second. International relations and agreements concerning outer space.

Third. Security standards and safeguards with respect to outer-space activities.

Fourth. The control and dissemination of information concerning outer-space activities.

Fifth. The protection of health and promotion of safety in connection with research, development, and production activities relating to outer space.

Space, missile, and rocket problems—and our whole defense posture—must be the first concern of this session of Congress. In one specific, Congress must augment its committee alinement to help ease and encourage America's entrance into the space age.

Missiles, rockets and satellites are not only the number one order of business today—they are also going to be of vital importance for years to come. The splendid record of the Joint Committee on Atomic Energy is a good precedent for a Joint Committee on Outer Space. The new joint committee can act as an effective and constructive watchdog over our immediate outer space military plans and can also in the future deal with the potentially knotty problems of outer space control, jurisdiction, and use.

If Congress is to cooperate fully and completely in America's efforts to maintain dominance in the space age, it is essential that we have a group constantly studying developments in these fields. It would not only keep Congress and the American people informed of progress in outer-space work, but would provide the necessary expertise for formulating legislation and policies in this complex area.

At the same time, it is imperative that Congress act to create a Cabinet post of Secretary of Research and Development. Operating from such a powerful position, he could promote coordination and cooperation among all groups dedicated to scientific progress, not only as to projects undertaken but as to the hiring of precious personnel. His inherent prestige could help lift basic scientific research above the secondary level, not only for defense purposes, but in the long run to raise our standard of living. He could promote the friendly, responsive, and understanding atmosphere in which science can flourish. Only an America where science is encouraged and fully supported can survive in the space age.

The immediate, number one problem of Congress is to provide the Nation with the wherewithal, the understanding, and the cooperation necessary to stay ahead of the Russians in the military and scientific fields. But at the same time, we must keep an eye on the long run, and must lay the foundations now upon which future scientific advances can be built.

A Joint Committee on Outer Space and a Secretary of Research and Development are musts, not only for the long haul, but for the immediate speedup of our science programs. I am confident the American people and Congress are prepared to take these significant steps so essential to our adjustment to the space age and to our survival as a free Nation.

[Congressional Record, January 15, 1958]

ESTABLISHING A NATIONAL COMMISSION ON ASTRONAUTICS

Mr. COAD. Mr. Speaker, yesterday I introduced a bill which, if enacted, will establish a National Commission on Astronautics.

It is obvious that the United States is faced with a situation of grave peril. This situation has arisen basically from the lack of proper perspective on the part of Government leadership. We could have had, at this time, a greater technical achievement than any nation on earth if we had fully utilized our resources and capabilities in a vigorous, sustained manner, without the waste of time and duplication of effort which has impeded our progress. Coupled with our failure to exploit our abilities to the fullest has been the appraisal which now appears to be correct that research in and control of outer space holds consequences of the greatest magnitude. In studying the intent of the Soviet Union, it is obvious that research in and control of outer space is an objective of that government. It should now be obvious to us that the Soviets are serious in this intention, which is made clearly evident in the present superiority of the Soviet Union in the technology of rockets and missiles and the successful achievement in taking the first steps into the field of astronautics.

As a consequence, the United States stands today seminaked and exposed from two directions. The first is the more immediate peril

which we face over the next few years from perfected operational intercontinental ballistic missiles of the Soviets. But secondly, and equally perilous, is the long-range threat of unilateral control of outer space by the Soviet Union.

The more immediate threat requires that we must immediately initiate and prosecute a missile program which will guarantee that from now on we will possess missiles and rockets superior or at least equal to anything that any other nation may develop. This immediate problem is one of national defense, and is the vital concern of the Department of Defense. It must be expedited without delay. The bill which I present does not remove any defense item out of the Department of Defense. The military will continue to perfect its program and its missiles.

However, the need for a civilian Commission on Astronautics is evident. We are in dire need of promoting research into the problems of interstellar travel; of the benefits of manned space platforms; and of all other beneficial products of conquering the space beyond the reaches of this earth, in order that the people may profit thereby. If the fields of research, development, and operation are permitted to fall exclusively to the lot of the military, we are inviting, at the outset, the hostility of a space war.

The end result of the legislation which I offer is to assure the common defense and security of this country, to further establish the general welfare of our people, and to promote the interests of international peace.

In President Eisenhower's recent reply to Soviet Premier Nikolai Bulganin he stated:

> I propose that we agree that outer space should be used only for peaceful purposes.

The proposed National Commission on Astronautics is directed to this peaceful end.

There are three basic reasons for the passage of this bill.

First. To save time: a civilian Commission in the field of astronautics is not held by the redtape which binds the Pentagon in many of its decisions. Present "buildup—foldup" activities are time consuming. The space age is one which has been born in speed, and time is of the greatest essence. A civilian Commission, through coordinated and unified effort, would save time and advance a program into this new frontier. The matters which must be researched, developed, and operated could well be subjected to costly delay if this program is not released from military control.

Second. To save money: It is no secret that the Russians would like for us to spend ourselves into economic slavery. It is also no secret that we have been subjected to costly duplication in bringing our missile program to its present status. There has been no circulation of essential information, there has been obstinate rivalry and needly expenditure of funds because of this clumsy method of military operation.

The National Commission on Astronautics as a civilian commission would be organized to chart the various fields of endeavor, disseminate and circulate vital information, and avoid duplication of expense and effort.

Third. To save life: The knowledge of and the control of outer space will bring great blessings to man. The vast fields which will be opened up will bring commensurate benefits in the form of better communication, weather mapping, and general knowledge of our planet and the entire universe, which is vital to man's ever-increasing study of himself and his surroundings. By gaining leadership in this field, we can be assured that new-found knowledge will be used for peace.

Further, the control of space is vital to the future existence of a free people. The long-range threat of control of outer space by the Soviet Union must be met with a sensible, well-planned technical program which will insure that outer space will never become a bastion denied to the United States and used by our enemies to attack and destroy us.

The program I propose is sound, reasonable, economical, and capable of achieving the goals we seek. By planning on a long-range scale, we will avoid the very wasteful practice of starting and stopping, of duplication, and of other redtape extravagances, which have characterized so many of our development programs of the past. Because I believe that we must heed the wise counsel of the preponderance of this Nation's most able and talented citizens who tell us that whoever controls outer space will control the world; and because I feel that we must employ technological superiority in the pursuits of peace, we can do no other than be seriously set to the task of researching, developing, and operating this vital program in astronautics.

[Congressional Record, January 16, 1958]

Meeting the Soviet Challenge

Mr. Holifield. Mr. Speaker, the text of President Eisenhower's reply to the two proposals of Bulganin was published in the newspapers of January 13. He made three major proposals. I believe they were constructive in principle and I shall support the best program of implementation which the executive and legislative branches of Government can develop.

I plan to comment today on the part of his proposal in which he stated and I quote "to be the most important problem which faces the world today." I quote the point designated in his reply as 3 (a):

> 3. I now make, Mr. Chairman, a proposal to solve what I consider to be the most important problem which faces the world today:
>
> (a) I propose that we agree that outer space should be used only for peaceful purposes. We face a decisive moment in history in relation to this matter. Both the Soviet Union and the United States are now using outer space for the testing of missiles designed for military purposes. The time to stop is now.
>
> I recall to you that a decade ago, when the United States had a monopoly of atomic weapons and of atomic experience, we offered to renounce the making of atomic weapons and to make the use of atomic energy an international asset for peaceful purposes only. If only that offer had been accepted by the Soviet

Union, there would not now be the danger from nuclear weapons which you describe.

The nations of the world face today another choice perhaps even more momentous than that of 1948. That relates to the use of outer space. Let us this time, and in time, make the right choice, the peaceful choice.

There are about to be perfected and produced powerful new weapons which, availing of outer space, will greatly increase the capacity of the human race to destroy itself.

And this is the President speaking on his own responsibility—the Commander in Chief of all the defense forces of the United States.

If indeed it be the view of the Soviet Union that we should not go on producing ever-newer types of weapons, can we not stop the production of such weapons which would use or, more accurately, misuse, outer space, now for the first time opening up as a field for man's exploration? Should not outer space be dedicated to the peaceful uses of mankind and denied to the purposes of war? That is my proposal.

Mr. Speaker, I could not be in closer agreement with the President's words as quoted. The problem we face is, How can we persuade the Soviets to agree to cooperate in bringing into being a guaranteed arrangement that will insure the people of the world that outer space should be used only for peaceful purposes?

The Soviets have proven by their actions, during the years when they were far behind us in almost every phase of military power, that they would not cooperate with the family of nations in establishing a peaceful world. I need not recount the record of Soviet uncompromising obstructions both within and without the United Nations.

Now that we have witnessed their forward surge in space weapon capabilities based on demonstrated advanced missile propulsion power, are there any among us who believe that this added power will cause them to become more conciliatory? Can we as reasonable men expect a new humility to govern their actions? The President has many times before and now once again pleads for deeds instead of words.

Until those peaceful deeds demonstrate a sincere desire for universal peace on the part of the Soviets, we of the free world would be fools indeed as well as traitors to our birthright of freedom if we falter for a minute in our vigilance in the preservation of liberty.

While we explore therefore every avenue, every opportunity for constructive negotiations in the direction of peace—we must prudently pursue the goal of military strength—strength which can be used if negotiations fail—strength to protect the freedom of our own country and the strength to help our allies in the free world against the Communist aggressor if he decides to strike for world domination.

I want to stress the point.

Every attempt should be made to work through the United Nations organization, but due to the delay which is inherent in that organization and the obstructive power of the veto—we must initiate protective research and development prior to and pending such possible collective action.

What is our military strength today? Has the Soviet suddenly relegated our former military superiority to one of inferiority to

theirs? What is the significance from a military standpoint of the two sputniks and their vigorous and apparently well advanced intercontinental ballistic missile program? These and many other questions must be resolved in the interest of national survival and they demand a clear cut national policy followed by a national program to implement that policy.

This Congress will hear much about our missile defeat. This will be good. It is a time for speech and debate, for the Congress to show its greatness and to prove the wisdom of granting powers to elected officials.

This is a particular burden on those among us who are assigned to certain committees. For one, I feel the duty of being a member of the Joint Committee on Atomic Energy—the duty to express my deep convictions—convictions based on a variety of information pertaining to scientific information now in being and in prospect. As we start this year we find the United States in a new role—playing "follow the leader" behind the Soviet Union.

A few short years ago the Soviet Union was racing to duplicate our technical supremacy.

For 4 years they engaged in a crash effort to duplicate our atomic bomb. After several years of effort they duplicated our hydrogen bomb explosion—9 months later than ours. For 5 to 8 years they extended themselves to make jet bombers and fighters to equal ours. They now have jet engines with an estimated thrust 30 percent greater than ours.

In these and other fields they came from behind. During the time when we were ahead, we sat in smugness saying they would not catch up. We were fatally occupied with the harassment of scientific leaders and in the name of security destroyed some of them.

But today everything is reversed. It is we who are trying to catch up. It is we who are now playing "follow the leader," an awkward and dangerous game.

Our foreign and military policy is fixed on deterring aggression through fear of hydrogen retaliation. This policy of deterrence will not work if the Soviet Union can control outer space and from it destroy our striking or delivery power, if it is dependent upon planes or upon missiles which are solely land based.

Neither the United States nor the Soviet Union has even hinted at repudiation of hydrogen weapons. In fact, each week finds both powers becoming more committed to their wartime use. It is possible that a minor international incident might be the cause of their employment in strategic warfare. Such a strategic war of the near future may be decided only by control of outer space and the area under the oceans. Many scientists believe that in the foreseeable future, strategic attacks on our country will be launched from under the surface of the oceans contiguous to our land mass or from space vehicles stationed in outer space orbits.

If, as the years progress, we fail to control and master these areas, we will default from world leadership and become a second-class power. The Gaither and Rockefeller reports may say this in detail, but as a fact simply stated, our decline in the world will follow Soviet mastery of the strategic avenues of attack.

Without this control we face future positions of weakness as we did at the NATO Conference where we gave concessions to compensate for

our lack of technical superiority in the missile field. We may never again be the leader in conferences with nations or groups of nations in the free or Communist world, if we sit as a second rate scientific power in conference with nations who are ahead of us in techniques and weapons.

And we will be a second rate power, I tell my colleagues today, as long as we play follow the leader—for just as long as the Soviets set the scientific pace, and we only try to catch up in the areas where they are ahead.

We will be bringing our energies and spending our energies on duplicating that which is passé.

I can assure you, Mr. Speaker, that no new and imaginative program is being advocated by the Atomic Energy Commission or the Department of Defense. Nothing startling is on the drawing boards or in the computers.

Instead there is too much complacency and the inadequate suggestion that we need only spend a few billions of dollars more for missiles to follow the leader and afterward all will be well.

One technical defeat will follow another if we do not look beyond that which is feasible today and make bold and adventurous plans. Any technical leadership we enjoyed in the past was accomplished by trying for things deemed by many to be impossible. It was done with courage and without fear of failure.

The success of the Manhattan project of World War II, which developed the atomic bomb, was hardly promising at its inception. It was a calculated risk.

My colleague, the gentleman from Missouri [Mr. Cannon], the chairman of the House Committee on Appropriations, knows very well the mathematics of chance that were involved in appropriating the money that his committee made available under his skilled direction. It was a calculated risk. Even Admiral Leahy told President Truman that as an ordnance proposition he knew an atom bomb would not work. That was the climate at the time.

The decision to make the hydrogen bomb was a tremendous gamble. It was taken by President Truman against the advice of 3 of the 5-man Atomic Energy Commission and against the advice of the 15-man Scientific General Advisory Committee to the Atomic Energy Commission. I know, because I was the chairman of the special subcommittee that studied the feasibility of the hydrogen project, and which recommended that it would be started.

The decision to make an atom powered submarine—the *Nautilus*—was made with scant assurance of success, short of knowledge that Admiral Rickover was hard to defeat. The Navy thought so little of this project that they gave him a converted ladies' powder room for an office. But for the support of the Congress I doubt if the project would have been supported to successful completion. Practically every component in the *Nautilus* was a new creation for which scientists and engineers had to "invent on schedule," a Rickover phrase describing his developmental philosophy.

Admiral Rickover deserves the warm thanks of the Nation, for it is evident that his development work in submarines is ahead of the Soviets. We believe also that the Shippingport civilian power reactor is at this time ahead of their reactors in being. Many of us recall the fight against Navy tradition waged by the Congress to have the then

Captain Rickover promoted and retained to serve his country. The country has gained immeasurably from this action.

It is only initiative and bold decisions such as these which will bring us back to the forefront of nations. It is only this kind of courage which will guarantee us time to develop the peace and preserve our civilization.

Remember this, when the Soviets were racing to copy our achievements they did not neglect other bold ideas, or else there would be no sputnik and we would not have suffered the missile defeat.

It would be wrong just to recite these needs. I will be specific and offer a program.

I have said earlier that to win a strategic war we would have to control space and the area under the ocean. There should be concurrent projects to produce vehicles for this purpose.

My colleague on the Joint Atomic Energy Committee, Senator Henry M. Jackson, has spoken with great clarity on the need for "underwater satellites." A major program should now be started to bring them into being. The underwater satellite would be an advanced, large size nuclear-powered submarine with the capability of launching long-range missiles.

It would be very difficult to attack these vessels from space, and in periods of great crisis they could be secreted under the polar ice cap as was recently shown feasible by the *Nautilus*.

I ask my colleagues to get a recent issue of the Saturday Evening Post and read that story. It opens up a complete new vista in the abilities to protect our Nation.

There are open pools of water in the polar iceberg sea that allow submarines to rise within 1,500 miles of the city of Moscow. It would be very difficult to attack these vessels from space. The satellite would only be vulnerable to other submersibles and there should be a concurrent development of attack submarines capable of protecting a mother ship.

The one area of technical military work where our lead over the Soviet Union is clearly pronounced is in the nuclear-powered submersible. We should exploit this advanced technique by increasing the numbers and quality of nuclear submarines and by immediately starting the project to build the advanced underwater satellite heretofore mentioned. Remember, the Russians have already concentrated their naval effort in underwater fighting craft and are reported to have over 500 submarines, most of which are of the long-range snorkel type.

It is also estimated that they are building 100 additional submarines each year. The United States possesses a few over 100 submarines, many of which are obsolete World War II holdovers. Do you recall the havoc which Hitler's fleet of less than 100 submarines made in allied shipping during World War II?

It would be criminal and just short of treacherous to allow this type of naval program to lag and allow the Soviet to lull us into playing "follow the leader" for control under the seas.

We have asked our allies for intermediate-range missile-launching sites in Europe even though we do not have the missiles. The request has been met with worried response, but far worse, it threatens Soviet duplication—they will be ringing the borders of Europe with like weapons—perhaps sooner than we produce the missiles. Such would lead to a precarious situation—endangering world peace almost to the

breaking point. It threatens the good will of our friends abroad and assists the primary Soviet objective of splitting our alliances and, indeed, they are splitting. The problem of locating missile bases in NATO nations is so desperate that political parties in several countries must risk their political life on this one point. If we bring the large submarines armed with missiles into being quickly, the necessity for the highly vulnerable IRBM sites in Europe would lessen and our friends would breathe easier while world tensions soften.

CONTROL OF SPACE

I am now turning my attention to the other challenge we face, that is the control of outer space. Make no mistake—we are faced with the challenge—the 118-pound Sputnik I was the opening notice and the 1,100-pound Sputnik II was the clincher. Are there skeptics who believe this chapter of science is ended?

I can tell you that many of the scientists who developed the atomic bomb and the hydrogen bomb are not skeptics.

I can tell you that many of the scientists and engineers who built the *Nautilus* are not skeptics.

There were many skeptics who would have blocked the Manhattan atomic bomb project. But, thank God, there were a great number of scientists and engineers who thought it could be done. And, there was a limited number of men in the Congress of the United States, including our Speaker, of course, and our majority leader and the chairman of the Committee on Appropriations, the gentleman from Missouri [Mr. Cannon], who knew about this, and they were not skeptics. Yes, we also had a Commander in Chief who had the courage to order it started.

There were many skeptics who tried to block the hydrogen project. A wave of opposition passed over the country: We shall not do this: we should not do this. But, thank God, we had many scientists and engineers who thought it could be done, and the Atomic Energy Committee, with the exception of 2 members of the 18-man committee, thought it ought to be done, and once again we had a Commander in Chief who had the courage to order it done. America, the free world, had a narrow squeak that time. Nine months later, after we exploded the first hydrogen device in the South Pacific, the Soviets exploded a hydrogen device. We bought freedom by 9 months.

You answer the question, What would have happened if President Truman had vetoed the hydrogen gamble, or appointed a commission to make a long-range study lasting 2 or 3 years?

Once again we face a momentous decision. This time we are not the leader in a new field of science. We are a follower. The challenge is more urgent. The decision takes less courage because the door of outer space has been opened. The second Soviet-made sputnik is orbiting in outer space this very minute.

We are still earthbound with our 4-pounder and our 21-pounder.

Once again many of our foremost scientists and engineers are chafing at the bit. They are anxious to tackle the job. Will the Congress and the Commander in Chief accept the challenge and make the courageous decisions demanded now—today?

I do not know. As for me, not as an individual but as a United States Representative, I want it recorded now—today—that I advocate action, action without delay.

I am willing to pay more taxes and willing to take the political chance, if there be one, in the forthcoming election. In the past 12 years I've seen many scientific miracles accomplished, and many times I've seen the routing and discomfiture of the skeptics.

If we lose, we only lose dollars. If we win, we buy time to achieve peace.

The control of space will not come from the possession of missiles alone. We should have a major project, the size of the Manhattan project, if necessary, to develop a space vehicle.

A space vehicle might even be a craft which would carry humans outside of the earth's atmosphere and gravitational force. Once outside, it would have power sources for travel and conceivably could go to the moon or to other planets.

While nuclear power may have only limited advantages in propelling intercontinental ballistic missiles, it appears to offer great hopes for travel in space. Such phenomena as the use of the particles of the atoms themselves to drive the vehicle after the atoms split, could possibly come into play.

The sputnik and the ICBM are but missiles, distant cousins of the artillery shell. Rocketry is not new to the world. And, except for some areas of the Soviet technology, there had been few advances beyond the German V-II rocket of World War II. But I do not demean the ICBM as a weapon. In today's world it can well be called the ultimate weapon.

However, were we to develop space vehicles, the ICBM would not necessarily be the decisive factor, because control of space would restore the threat of retaliation and restore the power of deterrence.

From space, ICBM launching sites could be destroyed.

Perhaps interception in flight would be feasible. Above all, the development of such a vehicle would restore our world leadership.

Let us consider the source of propulsion for our missiles today and probably that of the Soviet missiles and their sputniks. We only know of two classes of missile fuel, that is, liquids and solids. Both require oxygen, or its equivalent, during the few seconds or minutes in which they burn.

This need of oxygen causes very difficult problems and can only be furnished for a few moments. In those moments, energy must be expended at a fantastic rate in order to achieve an altitude of 300 to 600 miles and a speed of approximately 13,000 miles per hour.

When the initial propulsive power of the fuel ceases, the orbital factor takes over. The sputnik vehicle no longer contains inherent propulsive power. If we had a continuing propulsive power, lasting weeks or months, tremendous vistas of altitude, range, and independent directional ability seem to be possible.

The energy released in a large atomic-hydrogen bomb explosion is many times greater than we or the Soviets will use in propelling ICBM's or sputniks.

The nuclear power in the *Nautilus* reactor core is released gradually. The nuclear core is extremely small, when compared with other fuels of like energy content. It lasts a long time. It does not require oxygen for energy release. Neither does nuclear fuel.

Do these interesting facts prove the feasibility of nuclear propulsion for space vehicles? Decidedly not. But they are very intriguing to scientists and engineers.

They seem to offer great possibilities to many scientists and engineers in the nuclear field. Many problems accompany these possibilities, but no more than faced the scientists who made the atomic and hydrogen bombs and the *Nautilus*. Many of these scientists and engineers believe the problems can be solved if we go at it the same way we went at these other problems.

Today's atomic reactor is a very heavy mass, mainly because of its heavy shielding to protect human life. Some scientists believe an unmanned, nuclear propelled, space vehicle can leave most of its shielding at the launching platform and expend its radiation from the chain reaction in limitless space.

With the solution of shielding and medical problems, some day man might occupy a space vehicle and, through the factor of continuing propulsive power, direct the vehicle into a safe return to earth.

Think for a moment of the great possibilities of continuing nuclear propulsive power in a space vehicle. We know of the thousands of miles the *Nautilus* has traveled on 1 loading of fuel and the potential such a ship could cruise up to 4 years on 1 nuclear core. A new 100,000 miles estimate will allow the *Nautilus* to cruise for 4 years on 1 loading of fuel.

Just think of this potential if it could be transferred to space. Just think of a *Nautilus* in outer space rather than in the ocean. Of course, it would be a vastly different craft. But with the use of the tremendous and long-lived fuels of atomic energy, a space vehicle could travel over great distances and for long periods of time.

The physics of space travel are such that each added thrust of energy affects the vehicle's speed and direction. This principle and the almost unlimited power potential of nuclear energy suggest flights staggering to the imagination.

While it is quite apparent that we lag behind the Soviets in the development of missiles, we do appear to have a lead in the uses of atomic power for propulsion. We have accumulated much knowledge in this field and our major laboratories have been working for years on propulsion for ships, planes and other things. It is for these reasons that I believe we should project our plans into the future. We should, after proper consultation with some of the same scientists and engineers that have brought other dreams into reality, inaugurate a space project.

We have the capacity for such a project. We have the scientists and engineers. In hearings before the joint committee we have learned that some major atomic reactor development laboratories are not scheduled to work capacity.

I suggest that Admiral Rickover be assigned to the job of developing the space vehicle. I believe he is the one man with the greatest background of combined experience in the various fields of engineering, physics, and atomic propulsion development. He has the best record of industrial-military atomic project development. He was the driving force that gave us the *Nautilus* submarine and its sisters. He built the first large electric power-producing atomic reactor, at Shippingport, Pa. He is the type of man that could produce results in either the atomic underwater satellite or atomic-propelled space vehicle. His services should be used to the utmost and any resource he would need in dollars, men, or facilities should be furnished by a Nation—grateful for past accomplishments and hopeful for future deeds.

I do not think that the developmental costs for either project would be too great. We have learned that such revolutionary developments as the *Nautilus* cost but a small fraction of our overall defense expenditures.

OTHER IMPORTANT PROJECTS

Or course, the two major projects I cited are not enough. There must be production and development across the board. The Joint Committee has published a program designed to give us overall scientific, technical, and production supremacy in the atomic field.

The committee, under the able chairman, Carl Durham, and he is an able chairman, and he has been a great guiding force on that committee, has called for a speedup in the development of the nuclear-powered aircraft and the fixing of a completion date.

The program includes an increase in our production of fissionable materials for small yield atomic weapons which would be necessary in limited war—in so-called brush-type wars.

The committee has constantly advocated acceleration of the atomic power program to follow through on an atoms-for-peace policy, knowing that weapons alone will never win the minds of men, a bill that failed in this House by only a few votes just last year.

The program for tapping the thermonuclear reaction for peaceful purposes, and I am talking about the hydrogen reactions now, has enjoyed the committee's encouragement and support.

I understand the British atomic scientists will announce on January 24 an important laboratory breakthrough in the hydrogen fusion field. This discovery may lead to peacetime use of energy derived from the fusion of inexhaustible hydrogen. My colleague on the committee, the gentleman from Illinois [Mr. Price], has ably spearheaded the advocacy of further experiments of this type.

I would therefore emphasize that my proposal for two major projects to control the space and the area under the seas is a program that is complementary to the joint committee program.

The committee's program is a sound program and should be carefully studied by each Member of the Congress.

I have the privilege of reporting that our chairman, the gentleman from North Carolina [Mr. Durham], will today appoint a special committee to study this space problem in its relation to the one fuel which seems to offer the most promise for the greatest use in a vehicle in space—nuclear energy. That committee will be announced today.

In connection with many of these scientific and technical programs I would like to state some simple axioms which have developed during my experience in atomic energy matters. They are:

First. Scientific projects are successful only when there is unified direction and command in the hands of one person, and I am speaking about the *Nautilus* type of project. Collective leadership works poorly in the technical world on specific projects.

Second. Creativeness and accomplishment comes from the concentration of numbers of scientists and engineers rather than from their dispersal, as is occurring under the so-called partnership program of the Atomic Energy Commission.

Recently a group of experts told us that our scientists and engineers in the atomic program are spread out in what they called subcritical masses—groups too small to function—too small to have an opportu-

nity to whet their ideas against each other, to discuss the problems, and to suggest to each other the solutions thereof.

I agree with those who speak of a shortage of scientists and engineers, but I look upon this as a more urgent need of the future. We must have an educational system today which will produce scientists for future years. For today's crisis we have an adequate number for the projects I mentioned and other vital work. Talent should be concentrated into major laboratory centers for work on challenging new projects.

Third. The expenditure of dollars alone is no answer.

The efficiencies which evolve from unified direction and concentration of expert manpower produces savings. One need only compare the defense value we have received from Atomic Energy Commission projects where some of these concepts were used, to the overall defense expenditures, to see that very few dollars buy much more defense when major laboratories work on important projects under unified direction.

Every Member of this Congress must ask himself if he is beginning to see the decline of western civilization. Have we lost the spirit, the courage, and the will to be the center of world power, freedom, and culture? Will we make the moves now to insure time for securing the peace?

In but a few years we have become dedicated to a kind of standpat philosophy whose clichés and mottoes fail to define it. It is a school of thought which permits vital programs to be halted, top scientists to be discouraged, and the balanced budget to be a sacred cow.

In the face of a challenge for survival, without courage, imagination, and the will to survive our western civilization will decline—each of us who does not face his responsibility will help make a truism of the Marx-Lenin prediction that the capitalist system will fail.

In closing, let me say this Congress has greatness within its grasp.

If we have the courage to meet the challenge which has been hurled at us from the science laboratories of the Soviets—our liberties will be preserved and future generations of the free world will rise up to call us blessed.

[Congressional Record, January 23, 1958]

SATELLITES FOR PEACE

Mr. HALE. Mr. Speaker, 4 years ago on December 8, 1953, President Eisenhower appeared before the United Nations General Assembly and captured the imagination of the world with a stirring proposal for the peaceful use of atomic energy. This atoms-for-peace plan was implemented last year with the formation of an International Atomic Energy Agency.

The President's message at that time constituted a ray of hope for peace-loving millions in what was then called the atomic age. Here was a call for peace from the world's foremost statesman. Here was evidence that at least one nation wanted to devote to peaceful purposes the most destructive weapon ever perfected by man. Here was hope that total annihilation could be avoided through peaceful cooperation.

Much has happened since that time. Atoms for peace has worked. But the atom as a war weapon already is almost obsolete. We have moved from the atomic age to the hydrogen age to the space age—all within the short span of 4 years. Never before have conditions changed so rapidly, affording man so little time for adjustment. Horrible weapons capable of destroying entire populations can be sent thousands of miles in a matter of minutes. Earth war is being superseded by the concept of space war. We ask ourselves what lies ahead besides utter chaos.

Can the current trend toward war be redirected toward peace? This question is the most important ever posed in the history of the world. As the leader of the free world, our role is paramount. What constructive action can we take? Certainly we can and must continue to build bigger and more powerful missiles to blast an aggressor from above. We must build underwater craft capable of striking from below. But is this the ultimate answer. Of course not. We are building missiles and submarines, but the enemy is building them faster. We are creating a striking power able to destroy the enemy, but how can we avoid being destroyed ourselves?

No; the ultimate answer does not lie in an arms race to oblivion. True, we must continue to increase our defensive strength and offensive striking power until an alternative can be found. To display weakness would be to invite destruction. But true and lasting peace has never been built on the shifting sands of military power. The two concepts—peace and military power—are antithetical.

President Eisenhower recognizes the necessity of an alternative to the arms race which may some day lead to total war. He pleaded for peace at the Geneva Conference of 1955. He continued disarmament negotiations with Russia even after the Communists showed the world that they were interested only in making more bombs and more propaganda. He has now met the space-age challenge by calling upon Russia to dedicate space to the peaceful uses of mankind. In a letter to Soviet Premier Bulganin, the President has asked:

> Can we not stop the production of such weapons which would use, more accurately, misuse outer space? Should not outer space be dedicated to the peaceful uses of mankind and denied to the purposes of war?

The answer to that question is obvious. Space must be devoted to peace. The question, of course, is how can this be accomplished? Many proposals have been offered for international agreements for the peaceful use of space. But I think most of them have been too broad and sweeping to stand much chance of implementation in the face of Russian intransigence. I believe the President should take the same approach he used in his atoms-for-peace proposals. Mr. Eisenhower did not maintain the inflexible position in that proposal that all nations must agree to stop producing atomic energy for war purposes. Rather, he recommended that at least some of this power potential be devoted to peaceful uses beneficial to mankind. Why could not Mr. Eisenhower make the same type of proposal in relation to the conquest of space? Instead of seeking agreement for the cessation of all war-oriented efforts on missiles, satellites, and related space vehicles, he could call for the devotion of satellites to peaceful purposes.

This, then, is my suggestion—that President Eisenhower go before a special session of the United Nations with a single proposal. This proposal would call for an international agreement, similar to the International Atomic Energy Agency, to cooperate in the development and launching of earth satellites, and to share in the information obtained therefrom, for the mutual benefit of all in the conquest of space. This proposal could appropriately be called satellites for peace.

If we study the language of the President's atoms-for-peace proposal, we find that much of it—with minor changes—is just as appropriate today as it was in 1953, and could be used to present the proposal I have suggested. For example, Mr. Eisenhower declared:

> I know that the American people share my belief that if a danger exists in the world it is a danger shared by all, and equally, that if hope exists in the mind of one nation that hope should be shared by all.

Today a danger exists that has increased a thousandfold since December 8, 1953. Today that danger is shared by all without exception. But now even as in 1953, a hope still exists—not only in the United States, but also in many other nations of the world. It is the hope that man can somehow substitute peace for international turmoil and crisis. We would like to think that this hope is shared by Russia as well. The Russian reaction to a satellites-for-peace proposal would show the world whether the Communists truly do want peace, as they have so often claimed.

Up to this point almost every attempt by the United States to obtain Russian cooperation for peace has failed. The Communists have refused to accept a realistic disarmament plan. In fact, now they refuse even to negotiate. Under these circumstances it would be suicide for the United States to suspend unilaterally missile development and hydrogen-bomb testing.

If disarmament is impossible to effect, then we must look for a simpler path which ultimately may lead to the road to peace. This is why I suggest satellites for peace. It is a beginning—a small beginning, but it could foster better things. Actually, it already has a basis in the International Geophysical Year program, under which scientists of many nations are working together to learn more about earth and space. The earth satellite is an important phase of their cooperation. Russia has not shared all of her satellite knowledge, but she has given American scientists some data.

IGY ends in December of this year. We need some type of agreement to pledge even greater cooperation in the satellite undertaking. The United States has not yet formally suggested such an agreement. The President indicated in his 1957 state of the Union address a willingness to enter into "any reliable agreement" which would "mutually control the outer space missile and satellite development." But Mr. Eisenhower did not make a distinction between missiles and satellites. This distinction is important, as I shall point out. Then, shortly after the President's message, our representative in the United Nations said that:

> The first step toward the objective of assuring that developments in outer space should be devoted exclusively to peaceful and scientific purposes would be to bring the testing of such objects under international inspection and participation.

But here again the reference was to earth satellites, intercontinental missiles, long-range unmanned weapons, and space platforms. It is extremely doubtful that a comprehensive agreement of this kind can be obtained under existing conditions, although we should continue to seek such an agreement.

In the meantime, we should distinguish between earth satellites and ballistic missiles. The missile, an extension of a long-range gun, should continue to be subject to general disarmament negotiations. But the satellite, which spends its time in an orbit, is entirely different. Its development has not yet been oriented predominantly to war purposes, making it a logical starting point for an international agreement. Such an agreement should be proposed now, however, before military aspects of satellite development take precedence over the current emphasis along peaceful lines. Because earth satellites will not be vital to national defense for some time to come, a system of international cooperation and even control might have enough time to take hold before they become primarily military weapons.

International cooperation and control obviously would be difficult to obtain once the satellite is regarded as an important military asset. Yet it is at that stage—when the satellite is militarily dangerous—that international control is most necessary. Why wait until it is all but impossible to achieve such control? "Satellites for peace" should be proposed while most feasible. That time is now. Such an agreement could be highly important as a precedent leading to the eventual control of all outer space for peaceful purposes.

It might be argued that even the "satellites for peace" proposal is too comprehensive for general acceptance. Perhaps this is why the Commission To Study the Organization of Peace, in its report Strengthening the United Nations, suggested that the United States seek only the international registration and verification of satellite flights as a short-run policy. But I think we should go further than the Commission has suggested. The cooperation of all nations in the peaceful development of these satellites would be far more substantial, and would set an important precedent. The registration and verification of flights would naturally be included in such cooperation.

The United States hopes to launch its satellite soon. The time is ripe for giving serious thought to an international agreement along the lines I have suggested. We must not overlook any possibility of easing the tension which exists today in this race to obliteration. If "satellites for peace" is such a possibility—and I think it is—then we should propose it to the world.

[Congressional Record, February 4, 1958]

We Could Have Had a Satellite Before the Soviets

Mr. McDonough. Mr. Speaker, with the launching of the American satellite which is now circling the earth in orbit, it is possible for Americans throughout the Nation to take a new look at the comparative positions of the United States and Russia in the development of rockets and satellites including the all-important intercontinental ballistic missile.

An excellent analysis of the progress of the United States in the rocket and satellite field has been made by Dr. I. M. Levitt, director of the Fels Planetarium of the Franklin Institute of Philadelphia. Dr. Levitt points out both the strength and weakness of the United States to demonstrate that we are not as weak as we thought we were, but that we do have areas of weakness that must be overcome. Most important, now that America recognizes that Russia has a potential scientific strength which is a threat to the free world, we are no longer complacent and will make whatever effort is necessary to overcome our weaknesses, and to equal and surpass the scientific progress of Russia in the satellite and rocket field.

The following is the article by Dr. Levitt entitled "We Could Have Had a Satellite Before the Soviets":

WE COULD HAVE HAD A SATELLITE BEFORE THE SOVIETS

(By Dr. I. M. Levitt)

The Americans could have put a satellite into space before the Soviet Union.

And it is this writer's considered opinion that the Soviet's launching of the sputniks gives us strong reason to believe that the Russians do not have an ICBM, and will not have it in the near future.

What's more, the Soviet Union was well on the way to complete world domination until it made the fatal mistake of launching these artificial moons. By them it informed the world of its latent powers, and awoke the world from a complacency deeper than that with which it was drowsing prior to the rise of Hitler.

First, let's have a look at the background.

In May 1953 this writer addressed a Signal Corps frequency symposium (in Asbury, N. J.) at which he proposed the establishment of an uninstrumented, unmanned, nonreturnable satellite vehicle. He disclosed for the first time that an inert object circling the earth could yield significant geodetic information concerning the earth. The following year he delivered a paper at the Fifth International Astronautical Federation Congress at Innsbruck, Austria. Here the same plan was detailed, and it was shown to be feasible to put this sort of satellite into the sky with existing hardware. All that was needed was to build a second and third stage rocket, or to adapt existing rockets for this purpose. The major item was the first stage rocket, and as this was already available the costs would have been modest and the returns invaluable.

Again in 1954 a group of scientists met in a Navy Department building in Washington and discussed the feasibility of launching a small satellite with existing hardware. Present at this meeting were Dr. S. Fred Singer who was to design the instrumented equipment with a total weight of 5 pounds, and Dr. Werner von Braun who was to design and assemble the vehicle to launch the satellite. This classified proposal, called Project Orbiter, was approved by the Office of Naval Research and Comdr. George W. Hoover was designated project engineer. But, unfortunately, before this group could do very much, somebody sold Project Van

guard to the National Academy of Sciences, and Project Orbiter was abandoned.

This is where the United States made one of its two mistakes in the satellite program. Project Vanguard required the engineers to start from scratch on an entirely new rocket system. Such a task normally takes 3 to 5 years and yet we promised to have it ready before the end of the International Geophysical Year, December 31, 1958.

It was obvious we had undertaken a task of extreme complexity. Present-day costs indicate something of this. While the original budget called for an outlay of only $10 million, to date $110 million has been spent. Thus we abandoned a sure though simple satellite for a possible complex one which is due to be launched only next year.

However, the game was not yet lost.

The Army had succeeded remarkably in the development of its intermediate-range ballistic missile—the Jupiter. In September 1956 one of these giant rockets traveled over 3,000 miles, reached an altitude of over 600 miles and a speed of 15,000 miles an hour. This speed was only 3,000 miles per hour short of satellite velocity. Adding another stage to this giant vehicle would have permitted it to establish a satellite; this in September 1956.

Well-authenticated reports indicate that five times in 1957 the Army requested and was denied permission to launch its satellite. Here was our last opportunity to launch the first one.

To say that the Russians surprised the Americans when they put sputnik in the sky is a fantastic understatement. This writer in Innsbruck in 1954 learned about the huge rockets being fabricated in Russia. Disquieting information was disclosed about the astonishing progress of their engineers. If this writer knew about it, certainly our intelligence was also aware of it. Yet the American people were completely taken by surprise, by the Russian coup.

But the most fantastic part of the story came a few days after the launching of the Soviet sputniks.

The wire services were immediately alive with reports of Russian superiority in all phases of rocketry, including the attainment of the Intercontinental Ballistic Missile (ICBM). Our most objective news commentators began saying the Russians could drop hydrogen bombs down our chimneys. They played up the sudden turn of the neutral nations from this country to Russia. They spoke of the open bold arrogance of those countries in looking upon Russia as the protective big brother.

Was there any real reason for this alarmist attitude? Did the Russians really possess the ICBM and could they use it as a threat to any part of the earth? Many people in this country believed it at the time.

I say positively that is not the case.

Had this country put a satellite into the sky in 1955 or 1956, could we in all sincerity have pointed to that satellite as a symbol of our scientific and technological superiority?

The answer to this is a decisive no.

By the same token the Russians possessing a satellite today cannot construe this as a symbol of their missile superiority. While there is some connection between the two, as we shall presently see, the possession of one does not necessarily signify the possession of the other.

On the contrary, as indicated in the first paragraph of this article, it is this writer's opinion that the launching of the satellites gives us reason to believe the Russians do not have an ICBM, and will not have it in the immediate future.

The Russians launched their Sputnik I and announced its altitude as 580 miles. When scientists announce an altitude it is usually the perigee altitude, that is, the closest approach to the earth. Instead of this, the altitude announced was for apogee, its farthest distance from the earth. This indicated that the injection angle of the satellite in its orbit was depressed by a much larger amount than is permissible in an ICBM. Similarly, the second satellite has a perigee of 101 miles and an apogee of 1,065 miles. Again this is a much wider variation than we could expect in a well-launched satellite.

This creates considerable doubt as to their possession of an accurate guidance system for their ICBM.

There are four elements which go to make up an ICBM.

First, there is the propulsion unit—the power unit which will carry the missile on its journey to the target. Second, the guidance system, which will permit the missile to be directed to a specific target area. And third, the problem of reentry, in which we have a missile traveling from 10,000 to 15,000 miles per hour, and this missile must reenter the atmosphere to come back down to the earth's surface. In doing this the missile will move against the atmosphere with high speeds and can eventually burn out like a meteor. Proper reentry will prevent the destruction of the missile before it reaches it target.

The last element is the warhead, the device which will cause the damage once it gets on target.

Now having enumerated the elements necessary for a successful ICBM, suppose we explore the respective abilities of the East and West to achieve them.

In the case of propulsion, it must be conceded that the Russians have outstripped us in the field of big rockets.

It is estimated that at least a million pounds of thrust or push was necessary to put Sputnik II in the sky, and today the West does not have this type of motor. Our ICBM will possess a single motor, with but 135,000 pounds of thrust—to which will be added two 100,000-pound boosters. But even with the boosters our scientists can count only on a thrust of about one-third of that which the Russians have demonstrated. Thus, the latter have a marked advantage. Coupled with this is the probable use of new, exotic fuels like the boronhydrides, which add a 50-percent boost in thrust for the same amount of fuel. The combination of the huge motors and new fuels give them an unsurpassed edge in the field.

Now let's speak of guidance.

It can be disclosed that in the case of an ICBM, the guidance must be held to about one-tenth of a degree of a proscribed flight path, or the missile will miss the target. Similarly the cutoff speed must be precise, or again the target will be missed. In the case of the satellite an error in the injection angle can be as great as one and a half degrees, and still the satellite will enter a closed orbit. It is true the orbit will be highly elliptical, but nevertheless it will circle the earth. Even the speed tolerance is greater in the satellite. If the speed is too great the satellite orbit will merely be larger. Drop the speed, within certain limits, and the orbit will be smaller. But this is not true of the ICBM. In the case of the missile, the injection angle must be precise and the cutoff speed must be accurate.

Now we can say this: The ability of a nation to establish a satellite does not demonstrate its ability to possess an ICBM. On the other hand the nation which possesses an ICBM can establish a satellite anytime it wishes.

The Russians have a satellite, but they have yet to demonstrate that they have fired a missile which landed on the target. The United States has done just this. We used this as a unique way of delivering a letter to Maj. Gen. John B. Medaris. Thus in the field of guidance the Russians may not even be in our class.

Now let us analyze the reentry problem.

President Eisenhower on his television program showed the Nation the white nose cone of a Jupiter C rocket, which had successfully reentered the atmosphere. Here was concrete evidence that a solution had been found for this acute problem. The details of this are classified and thus unavailable, but the proof is there. The Russians have yet to show that they have solved this reentry problem. Without this solution there can be no ICBM.

Finally we come to the problem of the warhead.

In this field we must admit that the Russians are our equals, or are ahead of us. Both countries possess thermonuclear warheads of tremendous destructive capacities. Both countries can destroy a nation in a single day with this type of weapon.

If we were to make a box score of the elements necessary and fill in what each country has achieved, it is evident that along a broad base, the United States is not behind the Russians in missile technology. In propulsion we are behind by perhaps 2 or more years. In the other elements we are ahead. We must also conclude that our scientists working under handicaps, opposition, and lack of direction have performed a superb job in missile technology.

United States	Elements	Russia
?	Propulsion	X
X	Guidance	?
X	Reentry	?
X	Warhead	X

The refreshing information that Russia does not possess the overwhelming lead, attributed to her by many, means we still have time to catch up on those technological facets which appear to be

her forte. This further leads to a prospective course of action the free world can take under the leadership of the United States.

Because of our wealth, position, and proven scientific capacity, the free world looks to us for guidance. In this field the United States dare not let the free nations down, for today it needs them as much as they need it. We Americans can help ourselves best by enlisting the aid of all scientists in the Western World to equal the total number of scientists in the East and West. Therefore, it is my considered opinion that the United States must begin sponsoring basic research not only in this country, but in every country in the free world, or Russia will overpower this country in a short time by sheer numbers. Brilliant scientists with broad backgrounds should be attached to our embassy staffs all over the world. They should be in the position to assess foreign scientific achievements, and bring them to the attention of our scientists. These men should be empowered to have translated into English the significant work of foreign scientists, for, unlike scientists of other countries, our men are inexcusably deficient in language abilities. Attachés should be charged with the responsibility of forwarding to our research centers all information bearing on current scientific research. They should be empowered to offer lucrative fellowships to foreign scientists, to permit them to pursue work at established centers in this country. They should be in a position to invite our own sicentists to go to research centers abroad for consultations.

Essentially this is not a new concept. In many facets of science this policy was pursued diligently and rewardingly during World War II. Today we belatedly recognize the benefits of such associations. Yet we apparently are still unwilling to release the shackles of security for the free interchange of ideas.

About a year ago this writer became aware of some of the difficulties inherent in the Vanguard project. He proposed the use of after-hours television as a partial solution to a particular problem. He suggested that a scientific office of this country sponsor a network television program to be held at, say, 1 a. m., e. s. t. The subject under discussion would be some particularly difficult aspect of propulsion, guidance, fuel handling, or other problem. To break this bottleneck, the writer proposed a science television hookup involving some 100 stations across the country. The stations would be tied together over the network lines. If the subject were classified, it would be a closed-circuit program; an unclassified subject could be freely aired in the usual fashion.

If a problem originated in Washington, the scientist responsible for the project would present his problem to the assembled scientists in studios or theaters over the country. When he finished, scientists in any of the 100 stations could take the floor or go to a blackboard for a chalk talk on this problem, and in turn the remote scientist could talk to the entire country. Perhaps the answer could materialize that same night. To be realistic, we must say that in all probability it wouldn't, but several thousand scientists would have been briefed on the problem, with perhaps a solution evolving at some future time. Here is a vast potential of brains that could be mobilized and tapped for the asking and for the expense of the program.

Would it cost a lot?

On investigation, this writer was told it might cost from $25,000 to $50,000 per week for a 1-hour program. If this were pursued for a year, the total cost would be $2.5 million—about 2 percent of our Vanguard cost. This is a ridiculously cheap way of bringing to bear on any problem the combined intelligence of America's scientists. Here is a way to make optimum use of our scientific brain power and imagination.

And here is another suggestion which might have an impact that would rival any Soviet satellite. During President Eisenhower's visit to NATO headquarters in Europe, I hope he will have gone further and (with his scientific advisors) visited the counterpart of the National Academy of Sciences in every country of the Atlantic Community. This would assure foreign allies more than anything else could of close scientific cooperation between the United States and the rest of the free world.

Free world scientists from the very beginning have fully realized the powerful psychological and propaganda impact of the satellite on the world. And this writer, in company with distinguished rocket scientists, would have preferred to see the first satellite a large, light inert body which could be seen by the people of all countries with the naked eye. In this way the world could look in the sky and see a visible manifestation of our science program dedicated to the welfare of all mankind. Instead our scientists chose to manufacture a tiny satellite, invisible except with optical aid, and if the experience with the sputniks is any criterion, then even with optical aid we have to know where to look or we will not see it. They did not succeed in putting this in the sky first. Yet for that we should feel everlastingly grateful. Had this country established the satellite first, we would have continued our complacent, leisurely ways until the entire world was submerged under the frightening advances made by the Soviets. When this writer goes to bed tonight he will offer prayers for those Russian scientists responsible for the satellite. These are the people who saved the free world.

Law Must Keep Pace With Space—Address of Hon. Kenneth B. Keating, of New York

Mr. Hillings. Mr. Speaker, our distinguished colleague, Representative Kenneth Keating, of New York, has given us pause for serious thought at the dawn of the space age in a speech he delivered to the New York State Bar Association on Friday, January 31, 1958.

The speech, entitled "The Law and the Conquest of Space," analyzes the problems of developing rules that will govern the use of outer space in the future. * * *

> * * * It seems particularly fitting to discuss with the New York Bar Association problems inherent in America's entrance into the space age. Your ability to meld science and the law in sane and progressive ways is well known. That attribute will stand you in good stead as we ponder possible changes in our laws necessitated by recent Buck Rogerish achievements. * * *

We hear, for instance, much talk that it will be the scientist who will chart the future course of the world. That is, of course, true to a certain extent. Clearly, it is the technician and the specialist who will provide the know-how and inventive genius which will spell much of the progress of the world in the years ahead.

But that is only half the story. There are others who will play important roles. They are the long-range operators. You might class them together as the social scientists.

They include such people as the anthropologist, the historian, the philosopher, political scientists, and the lawyer. These people are concerned that our attitudes, our customs and our laws keep pace with achievements in the scientific world.

The problem for the legal profession is not a new one. Down through the ages man has striven to attune his legal codes to progress in other fields. Constant change to insure maximum justice has been the hallmark of progressive and successful legal thought.

History reveals that the physical sciences did not reach fruition until the proper moral climate had been achieved in civilized sectors of the world. This was brought about by the rise of mature religions and the promulgation and acceptance of legal standards by which man's conduct could be guided.

The lawyer should be pondering all this today. He should remember the old maxim that forewarned is forearmed. Let that be the guide for the legal fraternity as we attempt to meet the promises and dangers of the dawning age of space conquest.

So it behooves all lawyers to be up and doing. We should challenge the demand that America channel all its best brains and talent into a Gargantuan effort to develop scientists and engineers.

Many of our young people should be guided in that direction; yes. But not all.

America's greatest contribution to the future may well lie in adapting rules of law to advances in the physical sciences. Freedom, fairness, compassion, and justice may then accompany and survive any such advance, regardless of how revolutionary it may be.

Our goal must ever be to strive for the truth, to search for the means to achieve maximum justice, and to explore paths to the happy road of worldwide peace.

The space age challenges to the legal profession are not far off. They are not obscured from our view at some distant, ephemeral point. They are upon us now. Scientists have taken us, in little more than 12 short years, from the dawn of the atomic age to the threshold of the conquest of space.

Scientists of this country can now predict a timetable of achievement. Of course, sputnik and muttnik have already become realities. Sometime this year the United States will launch a satellite equipped for space search. It is expected that a manned rocket plane will be flown upwards of 100 miles into space next year. By 1960, a man in a satellite may navigate it around the earth. Scientists expect in 1961 to land rockets on the moon and 1962 may see us encircle it. How far the Russians and other nations will go in this same period of time can only be a matter of

speculation. But one thing is certain. They will not be far behind.

So the age of space is literally upon us. Its effects will be felt by every resident of the earth.

As the President and our leaders search for answers to the puzzling enigmas of this new age, they must be aided by enlightened and understanding work by the legal profession. It is, after all, our function to help make rules to govern an orderly society. It is our duty to create understanding and respect for those rules. And it is our obligation to see that those rules are enforced.

These laws must be based on human experience. They must change to meet the changing needs of society. And where any society, or where any civilization itself, progresses to the point where existing laws are not adequate, then new laws must be shaped.

It is my opinion that we have reached that point. New laws and new concepts must be formulated to meet the promises and dangers of the coming age. And the lawyers of America must lead the way in this vital work.

It is not premature, therefore, for lawyers to give serious consideration to the legal problems which will arise out of the conquest of space. If we wait until the collisions occur before we devise the rules of the road, there may be no hope for the settlement of the clashes by a rule of law. What time will there be for judicial speculation when rival claims are made to the moon or to space itself?

It is true that law must reflect experience and to some extent, therefore, that legal solutions cannot precede practical needs. The impact of the space age, however, presents us with a unique challenge. We must anticipate and confront its problems before they become additional elements of world tension. The rule of law in the age of space is not a matter of philosophy, but a matter of survival.

The first legal problem of the space age, and of most immediate concern now that the first satellites actually have been launched, is the question of who owns space. We know that at common law, the ownership of land extended indefinitely up to the sky and indefinitely down in the earth. In Coke on Littleton we find the maxim: "To whomsoever the soil belongs, he owns also to the sky and to the depths. The owner of a piece of land owns everything above and below it to an indefinite extent." This maxim just barely survived the invention of the airplane.

In 1902, shortly after the Wright brothers' first flight, a convention was proposed under which the air would be free to commerce and travel just as is the sea. This proposal was rejected.

During the First World War, each nation began to assert exclusive control of the airspace over its territory. After the war, the law of absolute sovereignty over airspace was formalized in the Paris Convention of 1919. This provided that "every power has complete and exclusive sovereignty over the airspace above its territory." This principle has since been consistently adhered to in domestic legislation as well as in international treaties.

Significantly, the term "airspace" has never been defined in any of these treaties. Scientists have now established that there

is no fixed separation between airspace and outer space. It is apparent that law and science will have to join forces in arriving at an acceptable definition of these terms.

Suppose we were to attempt to apply the principles of established international law by extending the boundaries of each nation into outer space. Because of the curved face of the earth, the extension would give us an inverted cone which would grow bigger and bigger in relation to the country as it reached farther into space. At some point these cones would overlap and more than one state would be occupying the same airspace. Moreover, the continuous movement of the earth on its axis means that the relationship of particular areas on the surface of the earth to space beyond the atmosphere would be constantly changing.

These solar facts illustrate the impossibility of applying existing concepts of international law to the control of outer space. In my opinion, space beyond the atmosphere must remain the common property of all the nations, or, what is the same thing, the property of no nation.

To an informal extent, at least, freedom of outer space has already been established as a principle of international law by the course of international conduct in connection with the International Geophysical Year. Under various conventions relating to air travel, any nation could have objected to the flight of earth satellites over its projected territory.

The fact that there were no protests after this announcement or after the actual launching of the sputniks by Russia is strong evidence that the nations of the world recognize the freedom of outer space.

I urge that the United States take the lead in formalizing international recognition of freedom of outer space. Specifically, I recommend the following three-point program for international action:

First, an immediate declaration that outer space is not subject to appropriation by any nation. This "freedom of outer space" declaration could pave the way for peaceful cooperation among all nations to best utilize the treasures of these unexplored regions.

Second, I propose an international agreement barring the use of outer space for any military purpose.

Third, an existing international agency should be adapted or a new one formed for the joint exploration of outer space.

Such a program is urgently needed to promote a universal dedication to the development of outer space for peaceful, scientific, and humanitarian objectives.

The United States has already rejected any use of outer space for military purposes. A United Nations resolution sponsored by the United States and a number of other nations provides for a joint study "of an inspection system designed to insure that the sending of objects through outer space will be exclusively for peaceful and scientific purposes."

While thus far the salutary purposes of this proposal have been frustrated by Kremlin rejections to inspection we should continue to press for an early agreement along these lines. Today we are paying the toll for our failure to reach a timely agree-

ment for inspection of atomic devices while that inspection was still practicable. Now is the time, therefore, while space travel is still in its embryonic stages, to clip the wings of those who would utilize space flight for other than the pursuits of science and peace.

Another major legal problem is whether the international rules of discovery and occupation are suitable for determining the rights of nations to terrestrial bodies on which landings may be made. The prospect of annexing the moon or a planet to the United States is, of course, appealing. We can only speculate on what treasures these areas may contain: But the prospect is equally appealing to all nations and none could be expected readily to surrender its rival claims.

In my opinion any attempt to apply the present rules to solar claims would precipitate and magnify the same territorial conflicts in outer space which have plagued the earth for its entire history. The moon and other planets can never be successfully occupied on any exclusive basis without immeasurably increasing the risk of war. The moon and other planets, therefore, must be regarded as the satellites of all the nations of the earth. And there must be an early and firm assertion of international jurisdiction over these areas by an organization of all the countries of the earth.

All of this, of course, assumes that we will not find places like Mars already inhabited. Such a prospect continues to be supported by a number of scientific authorities. The problems of dealing with such space-people would be infinitely more complex than those raised by the mere occupation of presently unoccupied areas. But we cannot ignore this possibility just because its consequences are so immense.

A host of other practical problems will accompany outer space commerce. New principles of law will have to be adopted for the protection of persons, industries, and territories from misguided missiles or petered-out sputniks. Rules will have to be devised with respect to liability for injury or damage from activities in outer space. What would you say as to the launching nation's liability for damages if Sputnik II were to come crashing down on this auditorium at this very moment?

Some Federal regulatory agencies already are up against practical space-age problems. The Federal Communications Commission, for example, has received a formal protest that radio transmissions of the Soviet sputniks have violated global agreements for radio frequncy allocation. Under the International Telecommunications Treaty, certain bands are reserved for worldwide use for distress signals and scientific purposes. The unauthorized use of these bands by the sputniks may have resulted in serious errors of instrument calibration and interference with aircraft radio and radar beacons. This situation will be aggravated, of course, as more sputniks and baby moons are launched. A conglomeration of satellites, transmitting conflicting signals could endanger lives and would make tracking and transmission virtually impossible.

Still another Government agency, the Civil Aeronautics Board, has gotten into the act. Recently, it received an application of a

transportation company for an interplanetary passenger route emanating from Atlanta, Ga. This application was rejected by the Board because the applicant did not specify terminals to be served and failed to designate the type of aircraft to be employed. The agency indicated also that the application might be a little premature. But they did it all with a straight face.

These and other practical examples show that we lawyers have our work cut out for us. We have to start thinking now of a space-navigation code, a space-radio-communications code, and even a space-rescue code. It seems likely that in our lifetime, we will be drafting agreements governing the carriage of goods and passengers in space.

I urge all lawyers to keep advised of the progress in these fields, to offer suggestions, and to participate wherever possible. Specific attention should also be given to establishing law school courses devoted to these legal questions. The success of pioneering courses in atomic energy law provides a good precedent for this.

Turning now to the Federal Government, there are specific steps it can take to avert conflict and possibly disaster as we stand on the edge of space.

First, Congress itself must organize to deal with the problems of the space age. In this connection, I propose the establishment of a Joint Committee on Outer Space, modeled after the Joint Committee on Atomic Energy. This new committee would explore without delay the many legal, political, and scientific problems raised by our scientific advances. It would recommend legislation and policies to assure cooperation with other nations in joint ventures in outer space.

To spur scientific achievement, and in recognition of the importance of science to our national security, we should create a Department of Science, headed by a Cabinet-rank Secretary. This Department would bring together all existing Government scientific agencies, would stimulate and coordinate the Nation's science endeavors, and would work to eliminate wasteful duplication of effort.

It would also work to reevaluate our whole system of education in the light of the needs of our times.

Another important step which we should take now is to pool our knowledge of missiles and rockets and certain atomic information with our friends in the NATO alliance. It would be folly to say that we Americans have a monopoly on talent or know-how. We need the brains and the knowledge of our allies just as they need ours.

For that reason, I propose that we amend our existing laws to make possible a NATO pool of scientific information. It is my hope that such a pooling on the NATO level could be the first step to a pooling by all nations of satellite and space knowledge as further assurance of the peaceful exploration of space.

These proposals are only a start—the basic minimum. I am convinced that they are constructive steps in the right direction. They are offered as more than parts of a formula for victory in a race for survival. For I certainly pray that civilization has not sunk to the point where all it can hope for is to survive.

I am confident that our future holds more. It is within our power to make sputnik the spark, not that touches off world destruction, but that lights the path to world peace.

A genuine international effort to press the conquest of space and solve its many enigmas is one of the world's compelling needs.

In cooperating to prevent anarchy in space, every nation may well come to the realization that respect for one another on earth is our best hope for peace. Perhaps by this means men can learn that only through mutual understanding and give and take can we not only hope to survive, but to achieve maxium justice and freedom for all men.

The idea of solar travel as a practical reality is just around the corner. Because it is novel to the human mind is no reason to reject its implications.

Thus did men resist the idea of transoceanic travel, long after Columbus and others had shown it was an accomplished reality. So, long after men have soared to the reaches of outer space, notions shaped by man's earth-bound environent will continue to govern the thought and imagination of many.

Our hope for a peaceful future and for man's very survival lies in throwing off these ideas which have kept the world in a state of turmoil since time immemorial.

Mankind stands at the threshold of a new age of exploration and discovery that can expand his understandings and his horizons. The fruits of this new flowering of science and research must be shared peacefully by all peoples.

It is the way of common sense—and indeed it is imperative for the peace of this world—that there be a joint sharing of all nations in the great adventure into outer space from which these benefits will emerge.

In this great endeavor, the American lawyer in his traditional manner, must lead the way. While we may be uneasy about what lies ahead, we must be bold, imaginative, and resourceful. We must prepare ourselves for these new challenges with hope and enthusiasm—like the American pioneer faced the great frontier—fully aware of the promises as well as the perils that lie ahead. For in this great era which confronts us, men of vision rather than men of vexation, will most clearly focus on the bright vistas of tomorrow. The choice is clear. We choose between greatness and oblivion.

[Congressional Record, February 10, 1958]

A House Committee on Outer Space

Mr. Keating. Mr. Speaker, it has been my feeling that the problems of outer space—including military, scientific, and jurisdictional matters—should come under the aegis of a joint congressional committee. The magnificent and efficient service rendered by the Joint Committee on Atomic Energy provides ample precedent for this approach.

Therefore, on the first day of this session I introduced a bill providing for the establishment of a Joint Committee on Outer Space. Unfortunately, no action has been taken on that proposal.

Last week, the other body chose to go ahead on its own and set up a special committee to consider policy problems involved in our approach to outer space. Meanwhile, the House remains dormant.

Already, serious questions have arisen due to the failure of this body to take action. Various bills have been introduced concerning the multitude of unresolved questions deriving from man's venture into space. No single committee is now constituted to deal comprehensively and in a coordinated fashion with these measures. In many instances a single bill cuts across the lines of interest of a number of our standing committees.

The result already, is that a number of committees may want to duplicate hearings on a single issue or series of issues. We may witness the unappetizing sight of committee chairmen fighting for the first crack at a bill. And department and agency heads could well spend all their working hours trudging up to the Hill to appear before the plethora of committees considering outer-space problems.

We must frame a coordinated House approach to these issues by establishing a standing House Committee on Outer Space. It is undesirable to make this a temporary committee, in my view. After all, the problems of outer space are going to last a lot longer than this session or the next. And they are going to be of increasing importance as time goes on.

Mr. Speaker, I am presently drafting an amendment to the rules of the House to establish a House Outer Space Committee. By setting up this committee we can bring order out of the chaos which is bound to grow until we take action.

Such a group can work effectively with the Senate group and with the Government agencies and departments concerned to shape America's role in the space age. I still feel that the best way to proceed is by a joint committee. But in view of the other body's action, we must act with dispatch now and provide our own committee. To tarry longer is to invite confusion and manufacture jurisdictional problems.

I hope the speedy action demanded by the times will be forthcoming soon.

Resolution Backing Peaceful Use of Outer Space

Mr. Keating. Mr. Speaker, the gentleman from California [Mr. Hillings] and I have today introduced a resolution expressing the sense of Congress that the United States should take the initiative in efforts to devote outer space to peaceful uses. Prompt and firm congressional approval of such a resolution would show the world that the American people stand squarely behind their leaders as they attempt to gain international agreement on the use of the solar regions for nonmilitary purposes.

The imminent invasion of space by man-made machines presents very real problems which must be faced up to by Congress, by the American people, and by all the nations of the world. Specifically these enigmas are military, legal, and jurisdictional in nature.

The military dangers involved in the development of outer space are very real. The prospect of reconnaissance from satellites, or of rockets armed with nuclear weapons is clearly a reasonable probability. This extension of the tools of war into space heightens tremendously chances for the total destruction of earth civilization. At least, it seems plain that the nation which controls outer space could easily dominate the earth from this vantage point.

It follows that to avoid turning down a road of sure global suicide, the nations of the world must devise means for preventing the use of outer space for military purposes. And in a more positive vein, we must make every effort to achieve cooperation and sharing of solar information in order to stimulate peaceful advances.

The United States has already taken the lead in pressing for international cooperation on the peaceful utilization of outer space. President Eisenhower, Secretary of State Dulles and other leaders have proposed that immediate steps be taken to insure that space will not be used for warlike purposes.

The timing of such steps are of the essence. Now, while the patterns and precedents concerning space exploration, use and control are being established, is the time to reach agreement that solar areas will not be used for military purposes. It is far wiser to control the infant now than to attempt to chain the giant later.

A ringing vote of approval by Congress, speaking for the American people, would strongly back up our leaders in their quest for agreements. It would reaffirm in the eyes of the world our dedication to the cause of peace.

In this great endeavor, America must lead the way. We must pioneer with boldness, imagination, and resourcefulness. We must continue to take the initiative, fully aware of the promises as well as the perils that lie ahead.

And in the end, if our efforts for peaceful use and control of outer space are successful, we may have opened a new era for all mankind. Perhaps man, freed from the ties of his earthbound existence by the common challenge of space, might even shake free from some of the jealousies and differences which beset human affairs and place peace on earth on such a precarious footing.

Passage of this resolution by Congress will show the world that the people of America are ready, willing, and able to accept the future with vision, not vexation. It will demonstrate to the world that we choose the path to greatness—not to oblivion. (See Bills and Resolutions.)

[Congressional Record, February 13, 1958]

A Plan for Producing Significant Research

Mr. McCormack. Mr. Speaker, under permission to extend my remarks I include an article entitled "A Plan for Producing Significant Research," prepared by Dr. Albert E. Sobel, director, department of biochemistry, the Jewish Hospital of Brooklyn, which I read with profound interest and which is worthy of deep consideration.

A PLAN FOR PRODUCING SIGNIFICANT RESEARCH—THE PROFESSIONAL SCIENTIST IN INSTITUTIONS WHOSE PRIMARY PURPOSE IS TO DEVELOP NEW KNOWLEDGE

(By Albert E. Sobel)

The appearance of man-made moons shot up from the USSR dramatically highlights the problem of the development of new knowledge in the United States of America. The situation can be summed up with the statement that the professional, as a rule, beats the amateur. In the modern sense, we have neither positions nor institutions whose primary task is to develop new knowledge. Thus we have no professional science. We have a fairly good training program for developing scientists but, after they have been trained, we have no positions for them as creative scientists. They are either employed by industry to develop commercial products or in medical institutions to find a cure for some disease, or they may obtain a teaching position at some university. In all these places creative research occupies a secondary role. The net return of fundamental knowledge compared to the talent invested is insignificant.

Until recently, this method worked, but the development of the professional scientists in the Soviet Union, placed in institutions whose primary object is to develop new knowledge, renders our present method as obsolete as was the bow and arrow when gunpowder was invented and applied to warfare.

* * *

The proposal which I have in mind is to establish productive scientific study organized around a relatively small number of unusually gifted investigators; about a hundred of them in each of ten new institutions covering various branches of knowledge. Each one of these scientists should have an appropriate number of assistants, and, in addition, should have immediate access to various technical services, such as libraries, glassblowers' and toolmakers' workshops, and an administration whose purpose is the maintenance of conditions under which the search for knowledge functions most effectively.

The key scientists should possess minimum qualifications, such as an extremely high intellect, proven talent, and first-rate training. They should each receive a salary of $40,000 a year or more, commensurate with the importance of their work to the nation, so that they could be drawn from any field of activity, including industry, and assure a continuity of effort.

Such development would be a tangible sign for every gifted young man and woman in this country that the development of new knowledge pays off. This would provide an incentive for our youth to undertake the study of science as a career. There would be an overflow of gifted, well-trained investigators, assuring qualified personnel for our industry, teaching, and project solution teams (i. e., missiles, cancer, etc.).

I believe that such development in our scientific setup would cause a snowballing effect resulting in reforms in our educational system since, once it is realized that there are places to go to in science with self-respect and pay, there is a good reason for undertaking such training and maintaining such activity.

The introduction of professional scientists functioning in institutions whose primary objective is to develop new knowledge is

suggested for three reasons: (1) to provide new knowledge at a faster rate: (2) to reinforce our existing facilities for the development of knowledge, both in industry and at the universities; (3) to inspire our youth to engage in science as a career. Our present universities and industrial development methods are essentially sound and should be kept intact and, in fact, they will be reinforced by the stimulus of new knowledge from the professional scientists, just as they will, in turn, stimulate the professional scientist. They have done a good job and will continue to do an even better job, once we have proper scientific activities that feed new solutions into existing problems and create new projects.

* * *

[Congressional Record, [illegible] 7, 1958]

HOUSE COMMITTEE TO H[illegible] LEGISLATION

Mr. BROOKS of Louisiana. Mr. [illegible] February 10, 1958, I introduced House Resolution 474, [illegible]des for the establishment of a House committee to handl[illegible]am. This resolution followed the series of moves on my [illegible]ended to emphasize the importance of making adequate provision for the time when it will be vitally necessary that we make provision for the control of the use of space. Last October I issued a release calling attention to the scientific developments which were forcing us into a position of providing for space legislation. I followed this with another news release in November of last year. On the first day of the new session of the Congress of 1958, I introduced a bill providing for a joint committee to be composed of both Senate and House Members to be appointed by the Vice President and Speaker of the House of Representatives. I am going to continue to urge provision be made to handle legislation and hearings covering space matters and I hope the Rules Committee takes action at an early date.

[Congressional Record, February 18, 1958]

ATLAS WILL BRING SPACE INTO RANGE

Mr. WILSON of California. Mr. Speaker, under leave to extend my remarks in the RECORD, I include the following article from the San Diego Union of February 9, 1958:

DESTINATION MARS—ATLAS WILL BRING SPACE INTO RANGE

(By Bryant Evans)

The Atlas intercontinental ballistic missile was developed as a mighty weapon. But it is more. It is a springboard into space.

That the prospect for the Atlas being used as a booster for a space vehicle is tangible and immediate was revealed in the published testimony of two Convair officials who appeared before a congressional subcommittee last month.

Thomas G. Lanphier, a Convair vice president, and Krafft A. Ehricke, assistant technical director of Convair-Astronautics, who is an internationally recognized space authority, let it be known that the Air Force is considering a Convair space proposal.

PLAN SUBMITTED

"At the time when Sputnik I appeared in the sky, we actually had a well-thought-through plan which we were able to submit and this plan aims at providing this Nation at the earliest possible time with a space operational capability using what we have and building on what we have right now," Ehricke said.

He made it very clear that what we have right now is the Atlas. He pointed out that it is a proven device and powerful enough not only to eliminate the present Russian lead but to reverse this lead.

Ehricke said the Atlas could carry considerably greater loads into space than the half-ton Sputnik II.

With such a device as the Atlas at hand Ehricke and his colleagues at Convair Astronautics envision an orderly development of space travel. In the foreseeable future they think that the San Diego-built Atlas will serve as a springboard to visit the nearer plants, Venus and Mars.

DRAWINGS MADE

A basic step in early space travel, as Ehricke sees it, is the building of small, permanent space stations that serve as manned satellites for the assembling and launching of space ships. Ehricke has made drawings of these space stations. At first glance they seem fanciful but when they are explained they turn out to be practical approaches to the problem.

Ehricke has designed his space stations to be built out of the fuel tanks of the spent Atlases shot from the surface of the earth. These would be collected and welded together as they spin around the globe. They would be large enough to be inhabited for short periods by the first spacemen who would ride the rockets up to the satellite orbit.

PROBLEMS POSED

Admittedly the building of a space station would represent a gigantic effort. To make such a station habitable under the most austere conditions poses fantastic technical problems. But Ehricke sees such a station as necessary to the further exploration of space. Launching space vehicles for longer trips to the planets becomes plausible once a space station to assemble them is in its orbit.

A vehicle launched from space itself would no longer have to overcome the friction of the earth's atmosphere. The orbit of the space station would already have neutralized the pull of earth's gravity.

The space vehicle that would be assembled from such a station and accelerated on their way to orbits of other planets will probably be entirely different from the earth-launched rockets. They need not be streamlined, because they will encounter no atmosphere. They may make use of atomic energy for sustained ac-

celeration on their long passages. They will have to carry air and food for many months of travel.

Ehricke has postulated a ship in which the passengers will ride at the extreme ends of long booms from the ship's central body. As the ship rotates on its path, the rotation will provide centrifugal force to counterfeit gravity in the passenger compartments. Without such an arrangement, passengers would feel no up or down sensation.

Of course, the space station is not the immediate next step. Prior to this it will be necessary to develop a method of sending a man into a satellite orbit and getting him back. Ehricke believes that this can be done by the means of gliders that can gradually bring a man through the atmosphere at a temperature low enough to keep him from burning up.

And even before this, there is the conquest of the moon. The engineers at Convair do not look upon hitting the moon with an Atlas-boosted rocket as a problem that is difficult to solve. They have hinted that it would be easier than steering an Atlas to a target on earth.

More intriguing, they said, is the problem of sending an Atlas-boosted missile carrying instruments around the moon. It may take pictures of the unseen other side of the moon and send them back by television. This would be an accomplishment worth Pravda's attention.

[Congressional Record, February 27, 1958]

GOVERNMENT AGENCIES DEALING WITH SPACE

Mr. MEADER. Mr. Speaker, Monday of this week I introduced H. R. 10912, a bill to create a 16-member bipartisan commission to study the multitude of agencies, both executive and independent, dealing with space, both in the atmosphere and beyond.

It follows closely another bill which I introduced in the first session of this Congress, H. R. 1201, which deals with matters of duplication and overlapping responsibilities in the area of atmospheric space only.

Both bills were referred to the House Committee on Government Operations and H. R. 1201 was referred to the Subcommittee on Legal and Monetary Affairs, of which my able colleague, the Honorable JOHN A. BLATNIK, of Minnesota, is chairman, and on which I have the honor of serving as the ranking minority member.

Historically, detailed matters of aviation, airspace and air-traffic control have been left by the Congress to the executive department and independent agencies. Congress in many respects has delegated its policymaking function in the field of aviation to the executive departments and independent agencies with the result that, like Topsy, a multitude of boards, commissions, and agencies have grown up whose interests, authority, and actions frequently are in conflict with each other.

H. R. 10912 would create a bipartisan commission of 16 members to study the multiplicity of Federal aviation agencies and agencies dealing with the utilization of space and to recommend suitable reforms to clarify their responsibilities and their relationship to each

other. Eight of those members are to be appointed by the President, four from within the executive branch of the Government and four from private life. Four are to be appointed from the Senate and four from the House of Representatives.

I include at this point a copy of the bill, H. R. 10912, and urge the Members of Congress to study it:

H. R. 10912

A bill to amend section 104 of the Budget and Accounting Procedures Act of 1950

Be it enacted, etc., That section 104 of the Budget and Accounting Procedures Act of 1950 (31 U. S. C. 18a) is amended to read as follows:

IMPROVED ADMINISTRATION OF EXECUTIVE AGENCIES

"SEC. 104. (a) The President, through the Director of the Bureau of the Budget, is authorized and directed to evaluate and develop improved plans for the organization, coordination, and management of the executive branch of the Government with a view to efficient and economical service.

"(b) (1) In order to provide for a study to be made to determine appropriate methods of eliminating the present multiplicity of departments, administrations, commissions, committees, boards, consultants, and other similar agents and agencies having responsibilities or engaging in activities with respect to aviation, the control and use of space and outer space, and related activities; eliminating the present conflicts, duplications, and overlapping of functions and activities, and lack of coordination, between and among such agencies as well as between such agencies and State and local governmental bodies and foreign governments and international organizations; and eliminating the present impediments to the prompt, efficient, and effective resolution of aviation, space, and related problems arising from such conflicts which hamper and delay necessary progress in and development of aviation, the effective use of space and outer space, result in waste and inefficiency, and threaten safety, there is hereby created a commission to be known as the Commission on Reorganization of Aviation and Space Agencies (hereafter in this subsection referred to as the 'Commission'), which shall consist of 16 members, 8 appointed by the President (4 from the executive branch and 4 from private life), 4 Members of the Senate appointed by the Vice President (of whom not more than 2 shall be of the same party), and 4 Members of the House of Representatives appointed by the Speaker of the House (of whom not more than 2 shall be of the same political party). Any vacancy on the Commission shall not affect its powers, and shall be filled in the same manner in which the original appointment was made.

"(2) In order to carry out the purposes for which the Commission is created, the Commission, after a full and complete investigation and study, shall formulate and recommend to the President for transmittal to the Congress, specific programs and policies calculated to eliminate conflicts, duplication, lack of coordination, and overlapping of functions and activities in the

field of civilian and military aviation, the use of space and outer space, and related activities, and more effectively to discharge the responsibilities of the United States, in conjunction with State and local governments and foreign governments and international organizations, in the promotion of aviation and the use of space and outer space for the common welfare and national defense.

"(3) The Commission shall elect a Chairman and a Vice Chairman from among its members. Nine members of the Commission shall constitute a quorum. The Commission shall have the power to appoint and fix the compensation of such personnel as it deems advisable, without regard to the provisions of the civil-service laws and the Classification Act of 1949.

"(4) Members of the Commission who are Members of Congress shall serve without compensation in addition to that received for their services as Members of Congress; each member of the Commission who is in the executive branch of the Government shall receive the compensation which he would receive if he were not a member of the Commission, plus such additional compensation, if any, as is necessary to make his aggregate annual salary $12,500; members of the Commission from private life shall receive $50 per diem when engaged in the performance of duties vested in the Commission. Each member of the Commission shall be reimbursed for travel, subsistence, and other necessary expenses incurred by him in the performance of his duties as a member of the Commission.

"(5) The service of any person as a member of the Commission, the service of any other person with the Commission, and the employment of any person by the Commission, shall not be considered as service or employment bringing such person within the provisions of sections 281, 283, or 284 of title 18 of the United States Code or of any other Federal law imposing restrictions, requirements, or penalties in relation to the employment of persons, the performance of services, or the payment or receipt of compensation in connection with any claim, proceeding, or matter involving the United States.

"(6) The Commission may create such committees of its members with such powers and duties as may be delegated thereto. The Commission, or any committee thereof, may, for the purpose of carrying out this subsection, hold such hearings and sit and act at such times and places, and take such testimony, as the Commission or such committee may deem advisable. Any member of the Commission may administer oaths or affirmations to witnesses appearing before the Commission or before any committee thereof.

"(7) The Commission, or any committee thereof, is authorized to secure directly from any executive department, bureau, agency, board, commission, office, independent establishment, or instrumentality information, suggestions, estimates, and statistics for the purpose of this subsection; and each such department, bureau, agency, board, commission, office, establishment or instrumentality shall furnish such information, suggestions, estimates and statistics directly to the Commission or any committee thereof, upon

request made by the Chairman or Vice Chairman of the Commission or of the committee concerned.

"(8) The Commission, or any committee thereof, shall have power to require by subpena or otherwise the attendance of witnesses and the production of books, papers, and documents; to administer oaths; to take testimony; to have printing and binding done; and to make such expenditures as it deems advisable within the amount appropriated therefor. Subpenas shall be issued under the signature of the Chairman or the Vice Chairman of the Commission or committee and shall be served by any person designated by them. The provisions of sections 102 to 104, inclusive, of the Revised Statutes (2 U. S. C. 192–194), shall apply in the case of any failure of any witness to comply with any subpena or to testify when summoned under authority of this section.

"(9) The Commission established by this subsection shall cease to exist on June 30, 1960."

I call attention to page 180 of the hearings conducted by the Legal and Monetary Affairs Subcommittees of the Committee on Government Operations in June and July of 1956, entitled "The Federal Role in Aviation" for a pictorial representation of the multiplicity of boards, commissions, departments, and committees involved solely in aviation research and development.

Mr. Speaker, I hold in my hand this graph of the various agencies in the executive branch of the Government, committees, subcommittees, panels, and departments which have responsibilities with respect to research and development in aviation. There are 56 of these agencies, some having statutory authority, others merely deriving their authority from the President.

The Harding report, included as an exhibit in the hearings to which I have referred, said this, and I quote:

> There are now over 75 committees, subcommittees, and special working groups addressing themselves to aviation facilities matters. The existence of so many groups is not in itself an evil, but it is increasingly apparent that the process of coordination is becoming more and more time-consuming and that preoccupation with current issues tends to obscure forward vision.

The report continues:

> It seems evident that there is need for forceful high-level direction of the studies leading to a national aviation program. Inasmuch as the regular departments of the Government are fully occupied with heavy operating responsibilities which are diverse and sometimes conflicting, and as the interdepartmental committees are fully occupied in resolving day-to-day conflicts, it seems logical to conclude, as we have done, that the direction of the study necessary for intelligent future planning should be established elsewhere in the Government.

Both the chart which I described and the findings of the Harding committee concern only the situation in that portion of atmospheric space reaching above our heads to a level of about 50,000 feet. But with the advent of the use of outer space, instead of clearing the jungle, as it were, we are taking steps to plant more trees by adding new

agencies, boards, and commissions designed to deal with the stratosphere, space, and outer space.

In an effort to eliminate the confusion and conflict in Federal aviation agencies and to establish clear lines of governmental responsibility, I introduce H. R. 11065 in the 2d session of the 84th Congress, which I discussed on the floor of the House on May 9, 1956. Similar to H. R. 1201 and H. R. 10912, that bill also was referred to the Committee on Government Operations and in turn to the Legal and Monetary Affairs Subcommittee.

The subcommittee, then under the able chairmanship of the Honorable Robert H. Mollohan, of West Virginia, held hearings on the bill to which I have referred. Those hearings comprise 1,418 printed pages. They included a broad committee study of the duplication, overlapping, and conflict of Government functions and responsibilities in aviation, and also gave consideration to the bill H. R. 11065 of the 84th Congress, to which I have referred.

Those hearings, in my opinion, resulted in the most comprehensive and penetrating study by any congressional committee on the general subject of aviation in the history of the congressional investigating process. I declined to press the subcommittee to report H. R. 11065 to the full committee because a Presidential study under Edward P. Curtis already was underway, which it was hoped might solve aviation organizational problems and result in clearer lines of responsibility and authority. In its report, House Report No. 2949 of the 84th Congress, filed with the House on July 27, 1956, entitled "Federal Role in Aviation," our committee offered these conclusions:

First, that the executive agencies in the field of aviation be reorganized.

Second, that the Curtis study be expedited.

Third, that membership on the Air Coordinating Committee of the Civil Aeronautics Board and the Federal Communications Commission, which are independent agencies not within the executive branch of the Government, be terminated.

Fourth, that the role of the Air Coordinating Committee itself in the regulation of aviation be clarified.

Fifth, that the predominance of the military departments on the Air Coordinating Committee and the Air Navigation Development Board be avoided.

Sixth, that the 5-year Federal airway plan be accelerated.

Seventh, that the TACAN-VOR/DME controversy be resolved.

And, last, air traffic control requirements within the Civil Aeronautics Administration be reviewed before airport-aid projects are finally approved.

The results were these:

The Airways Modernization Board was created by statute to take the place of the two-member Defense and Commerce Department-created Air Navigation Development Board, and a third member was added.

I may say that was the one specific recommendation of the Curtis study reported in May of 1957, and we in the Congress promptly adopted the law which created the Airways Modernization Board.

The Curtis study took much longer than it was planned to take and, in my judgment, accomplished much less than had been hoped. Aside from the bill to which I referred, creating the Airways Modernization

Board, the study made some broad general statements on the creation of a permanent Federal aviation agency, but left the writing of the blueprint of that organization to still another study.

Membership of the Federal Communications Commission and the Civil Aeronautics Board on the Air Coordinating Committee has not terminated. However, those agencies and particularly the Civil Aeronautics Board—because of the study of our subcommittee and because of the comments in our committee's report—has adopted a policy of greater care in participating in the deliberations and decisions of the Air Coordinating Committee to avoid being bound by the conclusions of the Air Coordinating Committee in any subsequent proceeding which might come before the Board in its quasi-judicial capacity.

Other executive agencies have shown greater willingness to reassert some functions originally conferred on them by Congress, but heretofore eclipsed by the Air Coordinating Committee.

Now, since some of my colleagues may not be familiar with the Air Coordinating Committee, I would like to develop in greater detail the creation of this committee, its function and the role that it may be expected to play in connection with aviation and the control of space in the future.

The Air Coordinating Committee has no statutory foundation. It was created by Executive order by President Truman shortly after the close of World War II. Its charter is a very brief one. Representation on the committee is assigned to quite a number of departments, I believe some 8 or 9, some having been added by Executive orders subsequent to the original order creating the Air Coordinating Committee.

The Air Coordinating Committee established what it calls panels. For instance, there was the airport-use panel created by the Air Coordinating Committee and there is an airspace panel.

I first became aware of the existence and authority of this executive Committee, functioning without the sanction of Congress, when a controversy arose about the use of airports in the Detroit metropolitan area. The airport-use panel conducted hearings in the city of Detroit in June 1955. On that panel there was a representative from the Civil Aeronautics Administration who happened to be chairman of the panel, a representative of the Civil Aeronautics Board, and then one representative each from the Defense Department, the Army, the Navy, and the Air Force. The military representatives on that panel outnumbered the civilian representatives by 2 to 1.

Now, what is the effect of a decision by the airport-use panel of the Air Coordinating Committee? First, they cannot do anything unless they all agree. You would say that would preclude any intemperate action. Any assumption of that kind is not well founded.

Furthermore, I found out that the Committee, which must operate by unanimous consent, is at some disadvantage in arriving promptly at a decision. Nevertheless, in the instance affecting my congressional district they had no difficulty in arriving at a decision which ordered, if you please, that the airport owned by the University of Michigan at Willow Run, Mich., now the commercial terminal for the airlines serving Detroit, should be converted to military uses, and that the airlines should conduct their operations at an airport several miles away called the Detroit-Wayne Airport.

You might say nobody should pay any attention to this panel because they had no authority to carry out their decisions. But when

they make a decision that decision is binding on the entire executive branch of the Government. From that time the powers which we vested in the Secretary of Commerce over the national airport program are to be governed by the decision of the Air Coordinating Committee, on which there was military domination at the rate of 2 to 1. The Congress never gave the Defense Department any authority to spend money for civil-airport construction. The Secretary of Commerce now is bound by this kangaroo court, which the Congress does not recognize.

I would like to refer to another example. I want to refer to the Committee's report and quote a passage regarding airspace utilization. My whole thinking on this subject has come around less to emphasis on aviation and more to a broader concept of the utilization of airspace. That is what concerns me at this time. We are beginning now to go beyond the atmosphere. Three satellites have been launched. The Defense Department has set up an agency called the Advanced Research Projects Agency, and they are in a sense taking control of outer space right now.

If we in Congress leave it up to the executive branch of the Government on a day-to-day basis to establish patterns of organizations and vested interests in the control of space and outer space, and do nothing about it, we will find that those patterns and those interests in space and outer space have become so fixed, that it will be almost impossible for Congress to change, repeal, or affect whatever structure has been established.

That is why I say it is important that we be alerted to this problem in the beginning so that our policies with respect to the utilization of space and outer space can be made by the policymaking agency of the Government, or that at least the Congress can have a hand in formulating policies. We should not permit all of the planning and policymaking to be done within the closed doors of the executive branch of the Government only to be handed to Congress as a fait accompli.

Here is another example of the importance of control of space and outer space: The Interior Department, as you know, has responsibility with respect to offshore oil. We had a good deal of controversy over the tidelands measure. The States were given a limited amount of the Continental Shelf and a still greater amount was vested in the United States as a national resource to be developed by the Department of the Interior for the benefit of all the people of the United States.

I quote from page 5 of our committee report on aviation the statement:

> It is impossible to estimate the known or predicted oil reserves in that area. However, it is apparent that there are substantial natural resources on the shelf, the development of which conceivably will be impaired. Since adoption of the Outer Continental Shelf Lands Act, vesting in the Department of Interior development of oil reserves, approximately $253,500,000 in bonuses and rentals has been received by the United States Government.

The Defense Department came along and said, "We want to shoot missiles over the Gulf of Mexico." Thereupon the Department of the

Interior was precluded from developing some of these oil resources on the continental shelf. Here, then, is a problem of conflicting use of airspace. It was not that the Interior Department wanted to stop the use of airspace for testing purposes, but that such use was inconsistent with its use for oil drilling on the continental shelf. It was also inconsistent with the use of sealanes by steamers or yachts. It was inconsistent with recreational uses of the surface of the water; it was inconsistent with fishing rights.

When you start using the airspace for a purpose which is inconsistent with another use either of the airspace or of the land or water beneath it, someone ought to be there to say which program has priority. I am just giving this as an illustration. Neither the Department of the Interior, primarily interested in the oil in the Gulf of Mexico, or anybody interested in protecting recreational rights or civilian uses of that area, were members of the air cordinating committee or its airspace panel, yet the decision of the Air Coordinating Committee, if unanimous, binds the entire executive branch of the Government.

These are not easy problems; they are difficult ones, but the considerations involved are tremendously important. If we in Congress just stand still and do nothing, some aggressive agencies will move in, and we will find a situation fastened upon us and it will be too late to do anything about it.

A vast portion of the air space over the continental United States already has been preempted by the military for testing uses or otherwise.

We know that with the expansion in air travel, with the speed of jets that will come into commercial use shortly, it will be difficult to find air routes, that will be able to skirt all of the warning areas and all other areas that have been preempted by one department or another of the Government, primarily the Department of Defense.

Nowhere in the Government is there a court where fair hearings on space use can be had? The Air Coordinating Committee is the only thing we have today. It is anything but a fair and impartial court, and Congress has done nothing about it.

I wish I knew the answer right now. I wish I could blueprint the proper organizational structure in the Government to assure fair and impartial consideration of all conflicting interests in the use of air space and the use of land or sea underneath the air space, to determine either the priority of use or specify the manner in which the space may be used or the time for which it may be used, so as to minimize the harm to other programs.

The bill I have introduced recently has already been referred to the Committee on Government Operations, and I am hopeful it will be referred to the Subcommittee on Legal and Monetary Affairs, of which my colleague and friend from Minnesota [Mr. Blatnik] is chairman.

I believe that our committee in studying the progress being made in setting up a permanent aviational organization, and studying steps already taken and those contemplated by executive agencies to stake out claims to outer space, can focus the attention of the Congress on this most important problem.

If our committee can solve the problem, I say go ahead and solve it, but I think it is going to be far too difficult for that. We have had study after study by the executive branch of the Government which have said, in effect: "Our aviation and space organizations are in a mess. We have to do something about it."

For years now we have been waiting for the executive branch to come forward with a solution to this problem. We have waited long enough. It is time for the Congress to step in and express its will.

I do not like to see these decisions on long-range matters that affect the entire future of our country and, indeed, the world, to be decided in some back room in the executive branch of the Government and then handed to Congress to accept without sufficient knowledge even to amend the proposal intelligently. Let the Congress get into this program and this problem from the beginning, and let us assert our policy-making functions in this regard.

Mr. BLATNIK. Mr. Speaker, will the gentleman yield?

Mr. MEADER. I yield to the gentleman from Minnesota.

Mr. BLATNIK. I want to most enthusiastically, genuinely, and sincerely commend my colleague and my friend from Michigan for the initiative and leadership he has taken in calling the attention of the Congress to this tremendously complex, involved, and important problem that is becoming increasingly more involved and more complex. Not enough attention is being given to this serious matter by the Congress, and I do hope that the legislation which he introduced will be sent to our subcommittee.

I should like to point out for the Record the splendid body of testimony which was compiled under the leadership of the gentleman from Michigan the year before last, when day after day and week after week he was compiling all the facts and testimony on this problem that he could. It is obvious what is happening in the age of this rapid development of transportation, jet propulsion, and missiles. The main stream of progress in that area has just swept by. It is largely through default that the military seems to be on the move with an utter disregard of the wishes of the Congress. Frankly, there is a great deal of lack of interest on our part too.

I commend the gentleman for calling this to our attention, and I hope we will proceed quickly with a thorough study and extensive hearings in the consideration of this most important problem.

Mr. MEADER. I thank the gentleman from Minnesota for those remarks.

Mr. LIBONATI. Mr. Speaker, will the gentleman yield?

Mr. MEADER. I yield to the gentleman from Illinois.

Mr. LIBONATI. I am just wondering if the gentleman would not develop the international situation of comity between countries relative to the control of outer space. Have there been any suggested military groups that have sat on any allied commissions of any kind for that common purpose?

Mr. MEADER. The gentleman has raised a most important point, particularly with respect to outer space. The bill does call for a study to be made of the relationships between our agencies having responsibility in the field of aviation and State and local agencies having some responsibility in the field and also international bodies, and the ques-

tion of outer space is one that is most acutely in the field of international relations.

I might say that another example which rather intrigued me was the assertion of ownership over a block of the high seas, which I observed when I visited Guantanamo Bay to see some Navy demonstrations of Terrier missiles. There a block at least 100 miles long and 50 miles wide on the high seas had been marked out as the property of the Navy of the United States. No one could fish in those waters; no one could fly through that area. He might find a Terrier missile on his tail if he did. And, no one could use that area for any other purpose. Ships could not proceed across the Caribbean through that area. Now, by what right did the Navy of the United States assert the use of a block of space on the high seas totally inconsistent with any other use of that territory during that time? I say in this field, particularly in the field of airspace over the oceans and outer space, we are in a state of anarchy, and the rule seems to be that whoever seems to get there firstest with the mostest has possession and, for all practical purposes, ownership of the territory. I am just asserting that those decisions should be made by law, by a properly constituted body, which will assure that all interests are considered and then proper priority be given to uses which may be inconsistent with other uses.

Mr. LIBONATI. Have there not been some claims made against the Government for damages suffered by fishing fleets in certain waters where atomic missiles were used, and so forth, and destruction as the result of that?

Mr. MEADER. I believe the gentleman is referring to the Japanese fishermen.

Mr. LIBONATI. That is right.

Mr. MEADER. I believe the gentleman is correct.

Mr. LIBONATI. Is that covered by any enactment that is in the future contemplated in your legislation?

Mr. MEADER. Well, the legislation creates a study commission. I might say the reason I have suggested a study be undertaken by a commission is that it will permit all interests to participate in policy formulation. It will permit private industry, it will permit the executive branch of the Government, it will permit the Congress to participate. If I thought it would be successful, I would recommend that a committee of the Congress make the study, because it is the policy-making body.

But, I have come rather regretfully to conclude that the Congress will not spend sufficient funds on itself to make a penetrating study. We have been very generous in providing substantial sums of money to study commissions, such as the Hoover Commission and the Kestnbaum Commission and so on. I believe that the study required is of such magnitude that it cannot be attacked successfully by any committee of the Congress unless a tradition is departed from, and we can spend adequate amounts on committees of Congress to hire the staff to make the study required. And, the bill contemplates that the commission will consider the underlying international implications of this problem.

They Probe the Future

Mr. Frelinghuysen. Mr. Speaker, under the leave to extend my remarks in the Record, I include an article from the February 15, 1958, issue of the Saturday Evening Post entitled "They Probe the Future":

THEY PROBE THE FUTURE

(By Clay Blair, Jr.)

The year 1957 may go down in history as the year of the sputniks. Not since the explosion of the first atomic bomb has man's imagination soared so high or his fears been so deeply stirred by scientific achievement. Yet one point must be clearly understood: the Russians have not conquered space. To be precise, they have made a tentative step into space, comparable in significance to the first flight of the Wright brothers' airplane.

Despite Mr. Khrushchev's boast that Sputnik I made the long-range bomber obsolete, the earth satellites indicate no shift in the balance of military power. The fact is that guided missiles with nuclear warheads—reliable, accurate missiles that can be flung from continent to continent—are still a long way off. For many years, the manned bomber will remain the principal carrier for nuclear explosives, and our fleet of bombers is still the largest and best in the world.

Now, after a late start, we have mounted a massive program to build a family of guided ballistic missiles. Several 1,500-to-2,000-mile missiles have been tested successfully. That we did not launch a satellite first is not the fault of our scientists. They had the technique and urged that it be done. Washington, failing to perceive the enormous psychological impact of such a device, lacked the will. We lost the satellite race by default.

Actually, the Soviets have won a battle, but if we proceed wisely and sensibly, the campaign can be ours. An important factor in this campaign will be the backing we give basic aeronautical research, which leans heavily on the corporate genius of the National Advisory Committee for Aeronautics.

NACA, a potent Government agency almost unknown to laymen, is unique in scope and makeup. Founded in 1915 by President Woodrow Wilson, after it was clear that the United States lagged behind Europe in airplane development, NACA was charged with the responsibility of advising the President on aviation research. Since Wilson's day, NACA has grown into a research network manned by 8,000 engineers and technicians, where most of the practical knowledge and much of the theory about aerodynamics in the free world have been spawned in the last forty-two years.

Our airplane and missile designers and manufacturers seldom make a move without consulting NACA. Says A. E. Raymond, vice president, engineering, at Douglas Aircraft, "its work is used by us every day in the year and we could not very well get along without it."

Alexander Kartveli, vice president, research and development, Republic Aviation Corp., says, "I consider NACA as one of our

most outstanding national scientific institutions. It has contributed enormously to the supremacy of American aviation."

NACA is bossed by 59-year-old Dr. Hugh L. Dryden, an internationally famous scientist who in his spare time is a lay Methodist preacher. Its engineers man three large laboratories: Langley Aeronautical Laboratory, in Virginia; a second aerodynamic facility, Ames, about 50 miles south of San Francisco; and Lewis, an engine and fuel lab in Cleveland. NACA does not design airplanes, nor is it the sole source of aeronautical theory. Universities such as M. I. T., Cal Tech, Cornell and Johns Hopkins contribute to the general body of knowledge, as do all aircraft, missile and engine companies, and the Armed Forces, which maintain their own aeronautical-research centers.

Most of the work in industry and the Armed Forces, however, is concerned with specific airplane designs—development work. NACA, on the other hand, concentrates on producing fundamental theories and concepts which have application to broad categories of airplanes and missiles. It is not pure research, in the sense of trying to find out what makes the grass green, to borrow one of Charlie Wilson's phrases. More precisely, it is what scientists call "directed" research; sooner or later, most of it evolves into projects that find their way into one of NACA's 53 wind tunnels and ultimately onto an airplane or missile.

Few of NACA's vast accomplishments become known to the public; some are too technically complex to describe, and many are classified for reasons of military security. Says a Navy admiral, "The Armed Forces and industry like to take credit for the big breakthroughs in aviation. But if you look into it closely, you can almost always trace them back to fundamental work at NACA."

To make certain that the needs of industry and of the Armed Forces are constantly kept in focus, and to avoid research duplication, the NACA staff is quarterbacked by no fewer than 29 committees and subcommittees manned by 500 of the Nation's leading aeronautical experts. They meet from time to time, without compensation, to monitor the agency's activities. The main committee—in fact, the National Advisory Committee for Aeronautics—reports directly to the President. Its chairman is retired Air Force Lt. Gen. James H. "Jimmy" Doolittle, who won fame in World War II when he led the first bombing raid on Tokyo. Less well known is the fact that he is a distinguished aeronautical engineer.

During the last 2 years I have visited 2 of NACA's laboratories—Langley, in Virginia, and the Lewis flight propulsion lab in Cleveland—half a dozen times. It was a fascinating but slightly bewildering experience. I recommend that anyone following in my footsteps first take a short course in aeronautical engineering.

Langley is the oldest of NACA's facilities. Its original buildings and first wind tunnel were dedicated in 1920, and it was here that a handful of pioneers began laying the hard foundation of modern United States aeronautical science. In retrospect, the early work seems incredibly simple. A breakthrough, then con-

sidered major, occurred in 1929 when an engineer discovered that a plane's speed could be boosted 15 percent by encircling the exposed pistons of an air-cooled engine with a cowling. During the 1930's, the lab was expanded and Langley engineers began stockpiling data on every conceivable aspect of aircraft theory—location of engines, shapes of propellers, configuration of seaplane hulls, operation of cooling systems, and so on ad infinitum.

One of their greatest achievements was the development of a family of wings—called the NACA airfoils—that at the time of World War II were used by about 95 percent of the aircraft in the world. "It is notorious," the British journal of the Royal Aeronautical Society huffed in 1935, "that many of our most capable design staffs prefer to base their technical work on the results of the NACA."

Today Langley is a massive installation, manned by an army of 3,200 scientists and technicians, blasting away at the strongholds of the aeronautical unknown with the most modern laboratory weapons man can devise. Its buildings, interspersed among the bulbous, snaking tubes of 23 major wind tunnels, have the brick-and-ivy look of a college campus, but, inside, the work is pushed at a frenetic pace. NACA engineers try to keep one jump ahead of the airplane designers, and one jump in their business can mean as much as 3 or 4 years.

Many of the men I talked to were probing the baffling enigmas of flight at 500,000 feet in space at speeds of 20,000 miles per hour. This is no long-range pipedream with them, but an immediate, pressing demand. Right now North American is building an experimental airplane, the X–15, that in a year or two may fly at better than 3,000 miles per hour.

The problems are enormous. At supersonic speeds, airplanes heat up like furnaces. Some means must be found to keep the temperature down and preserve the structure of the plane, which could warp or melt. The faster planes fly, the more difficult they are to control, especially at extremely high altitudes where the air is thin and conventional control surfaces are less effective. New control techniques must be devised. Turbojet engines seem impracticable for sustained operations above 100,000 feet, and beyond 2,600 miles per hour reliable ramjets, rocket, or nuclear engines must be perfected if man is to fly higher and faster.

Since the basic aerodynamic problems of high-speed aircraft and missiles are the same, much of NACA's fundamental research has a direct application in the missile field. Recently, NACA revealed that one of its leading engineers at the Ames Laboratory, H. (Harvey) Julian Allen, had made a major breakthrough. Allen had attacked one of the biggest problems in the development of the ballistic missile—the design of a nose cone, or reentry body, that would not burn up like a meteor when it plunged back into the atmosphere at speeds of 15,000 miles per hour or more.

Many laboratories around the United States had tried to design a suitable nose cone, and various materials, shapes and construction techniques had been advanced, tested and discarded. Most of these early experiments involved the use of a sharply pointed nose cone to minimize drag.

After a detailed exploration of basic aerodynamic heating, Harvey Allen concluded that a successful nose cone should be very blunt—seemingly, an aerodynamic absurdity. However, he had reasoned that the stronger shock waves of a blunt nose would actually carry off as much as 99 percent of the frictional heat. Today all of our long-range ballistic missiles have very blunt warheads.

NACA is one of the smallest Government agencies, and the work it turns out seems all out of proportion to its size and cost. Its annual budget is about $70 million, not including money for construction of new facilities. Its present plant is valued at more than $300 million. A visitor gets the impression that every dollar is spent wisely. Says George Trimble, vice president, engineering, at the Martin Co.: "We hear much talk about how inefficient Government-run organizations usually are, and indeed I have found most of them that way, but this cannot be said of NACA. In my experience I have rarely seen a research outfit with more talent or higher morale."

Many engineers have been lured away by salaries in industry 3 to 5 times greater than NACA can pay. But most of the good men remain at their posts with rare dedication, men like John Stack at Langley; H. Julian Allen, Abe Silverstein, at Lewis; and Dryden, who makes $20,000 a year, and recently, according to an aviation-company executive, refused an outside offer of more than $100,000. Says Sir Roy Fedden, dean of British aviation, "I look upon them as one of the finest and most selfless bodies of men in existence today."

Although the primary emphasis at NACA is on basic research, in emergencies it runs tests for the Armed Forces on special projects which the services are not equipped to handle. "In these days," says an NACA staffer, "the emergencies seem to occur with alarming frequency."

A recent case in point is WS-110-A, a secret Air Force project which for many months absorbed the working hours of many of the top engineers at NACA. WS-110-A (short for Weapons System 110-A) is more commonly known as the Air Force's chemical bomber project, so-called to distinguish it from the nuclear-powered airplane, which has suffered delays both budgetary and technical, and consequently is still a long way off. WS-110-A is the fantastic manned airplane that will be the future replacement for the B-52. It will have a speed in excess of Mach 3 (2,000 miles per hour at operating altitude) and high performance from ground level to 75,000 feet, with a range of eight or nine thousand miles. The chemical bomber will be the first United States Air Force plane to consume exotic or zip fuels, made from boron, which have been exhaustively tested and examined at NACA's engine lab in Cleveland.

Two large aviation companies—Boeing and North American—ran a grueling technical race for the WS-110-A prize, since in these times fat aircraft contracts are rare. Before submitting their final designs, engineers from each company closeted themselves with NACA engineers to gather up the latest basic aeronautical data, including some recent NACA breakthroughs, which

cannot be described for security reasons. Then each company presented its design to the Air Force in the form of hundreds of blueprints and specifications. However, the science of aerodynamics has become so infinitely complex that there are few men in the Air Force, or anyplace else, who can study a set of plans and tell if the airplane will do everything the manufacturer claims. There is much educated guesswork involved. The old, sure-fire way of buying a few test versions from each company has been abandoned because it wastes time and is too costly. Development of a few hand-built test models can run up to $750 million. So nowadays the Air Force turns to NACA for technical help in making its final decision.

In a case like this NACA walks a tightrope of impartiality. It will provide answers to specific Air Force questions about first one design and then the other. However, it will not directly compare the two airplanes, or come right out and say which one is better, nor does it reveal information to one company about its competitor's airplane.

In the end, the WS–110–A contract went to North American, but the decision was not an easy one to make, since both designs, based on NACA data, were very close in predicted performance. Many other factors entered into the decision. One was the availability of engineering and production facilities. Earlier in the year, during the defense-economy waves, North American had lost the F–107 and the Navaho missile; Boeing still has a huge backlog of orders for B–52's, KC–135 jet tankers, 707 commercial jet transports, Bomarc missiles and other items. In their various conceptions of the WS–110–A, engineers had stretched to the outer limits of know-how in supersonic aircraft design, and, as in the case of all new planes, there is an element of a gamble involved. With its F–100, F–107, and X–15, North American has actually had more experience in the production of supersonic aircraft, so that was another point in its favor.

NACA's most prolonged and demanding emergency period occurred during the years 1939–45, when the Nation's air arms expanded enormously for World War II. In 1938 NACA, pointing to the development in Germany of aeronautical research facilities better than our own, began begging Congress for money to expand its own aging installations. Maj. Gen. Oscar Westover, chief of the Army Air Corps, grumbled about the congested bottleneck at Langley. A valuable year slipped by before money was authorized for the new aerodynamic laboratory at Ames. In 1939, a special NACA committee warned of the superiority of European aircraft engines, and urged the immediate construction of a powerplant research center. But it was not until June 1940—after Belgium and Holland had been overrun—that funds were provided to start construction of the Lewis Lab in Cleveland.

Many years would elapse before NACA could fully exploit these new installations for basic aeronautical research. At the beginning of World War II, the decision was made at the summit to fight with the weapons in hand. Under pressure, NACA temporarily abandoned virtually all basic aerodynamic research and concentrated largely on applied research—that is, making

existing aircraft faster and easier to control, and production engines more powerful.

Between December 1941 and December 1944, NACA engineers reworked and patched up 115 different types of airplanes. One of the biggest headaches was a succession of tail failures on most of the Army Air Forces' fighters and bombers. After exhaustive tests in NACA tunnels, a remedy was found for each plane. Other aircraft were sent to NACA labs to see what modifications could be made to reduce drag. The speeds of some 30 aircraft were substantially improved in this manner. For example, when the P–39 came in for drag tests, it had a top speed of 340 miles per hour. After NACA modifications, its top speed was increased 54 miles per hour. The P–51, designed with a new NACA wing, turned out to be the fastest propeller fighter in World War II.

The late Secretary of the Navy Frank Knox summed up NACA's contribution to naval aviation: "The Navy's famous fighters—the Corsair, Wildcat, and Hellcat—are possible only because they were based on fundamentals developed by NACA. All of them use NACA wing sections, NACA cooling methods, NACA high-lift devices. The great sea victories that have broken Japan's expanding grip in the Pacific would not have have been possible without the contributions of NACA."

At war's end, when United States intelligence experts moved into German aeronautical-research centers, they found that German engineers had made sweeping progress in the investigation of highspeed flight. Behind the Nazi superweapons, such as the V–1 pulsejet missile, the V–2 rocket, the ME–262 turbojet airplane, lay a large body of high-speed wind-tunnel and theoretical data, which was miles ahead of similar data in the United States.

In spite of the fact that NACA's war work had been dictated by the decision to fight with existing weapons, the agency was criticized. In a long series of postwar policy meetings, steps were taken to restore NACA to its traditional role of providing basic research. NACA engineers, groggy from the unrelenting pressure of World War II, got set to face the even greater challenge of supersonic flight, which some authorities considered impossible.

Engineers at NACA did not believe supersonic flight was impossible, but they were aware of the formidable obstacles to overcome, not the least of which was the gathering of basic aerodynamic data. The first trouble they ran into was choking, a peculiarity of the flow of air through wind tunnels at about the speed of sound; it was impossible to establish with any degree of certainty how an airplane would behave at transonic speed. To get on with the investigation, NACA engineers devised other techniques. Small models, packed with instrumentation, were taken aloft in a B–29 and dropped; at Wallops Island, Virginia, an offshoot of Langley, other models powered by rocket engines were fired down a controlled range.

The most ambitious approach was conceived by Langley's John Stack: the development of a family of small, experimental

research aircraft that could actually be piloted through the speed of sound. They were to be powered by rocket engines or a combination of rocket and turbojet engines; at that time, engineers did not believe the turbojet alone could push a plane beyond Mach 1. These small aircraft, called X models, were built under a joint NACA-Armed Forces-industry program. On October 14, 1947, Air Force Capt. Charles E. Yeager, piloted the first of these planes, the Bell X–1, to a speed of Mach 1.05, acquiring fame for himself and destroying the myth of the sonic barrier. Since then the other X models, the Bell X–1A and X–2, the Douglas Skystreak and Skyrocket, have repeatedly smashed altitude and speed records. More important than the records established were the data collected from these flights by NACA's High-Speed Flight Station at Edwards Air Force Base. All of today's high-performance airplanes benefited in one way or another.

Gratifying as these flights were, engineers still clamored for controlled laboratory studies at the speed of sound. The irrepressible John Stack had been working on this deficiency, and in 1949 he came up with an ingenious slotted-throat tunnel which would dispel the choking and permit a transonic flow of air. This tunnel, the first of its kind in the world, was put into operation in 1951.

Some months later, a 31-year-old engineer at Langley, Richard T. Whitcomb, produced a revolutionary concept that had a dramatic effect on all our modern supersonic fighters. Whitcomb began by running drag experiments in the slotted-throat tunnel, and discovered almost immediately that the old methods of computing drag near the speed of sound were in error. The miscalculations had led engineers to underestimate grossly the total drag of an airplane. Perhaps, Whitcomb reasoned, that was why Convair's latest fighter, the delta-wing F–102, designed to be supersonic, had stuck just below the speed of sound. Having discovered a precise method of measuring drag and its effect on high-speed planes like the F–102, Whitcomb set about to find a way to minimize it. He succeeded in an astonishingly short time with a brain-twisting formula known as the area rule.

His concept called for a radically new approach to aircraft design. For those aircraft nearing completion Whitcomb recommended a treatment which would result in aircraft fuselages more nearly resembling Marilyn Monroe's torso than the traditional bullet. For that reason, his formula was quickly dubbed the Marilyn Monroe shape. If his ideas were followed, Whitcomb predicted, total drag could be reduced by as much as 25 percent. To aeronautical engineers, this was like saying he had found a way for man to run the mile in 3 minutes.

Whitcomb's concept was given a gimlet-eye going over by NACA experts and ultimately published in a secret NACA paper. Convair engineers came to Langley to investigate. The youthful Whitcomb asserted that with area rule the F–102 could be saved. Quite understandably, the Convair people were hesitant and slightly skeptical. Wind tunnels and theories had been wrong before; a modification of the F–102 would cost millions. However, to simulate an actual flight test, they built a one-fifth scale model of the F–102, with a Marilyn Monroe fuselage, and

shipped it to NACA's Pilotless Aircraft Research Station at Wallops Island. Intricately instrumented, it was mounted on a booster rocket and fired. The tests confirmed Whitcomb's wind-tunnel results, and Convair decided to gamble.

The F–102 was hurriedly redesigned to incorporate area rule, and named the F–102A. On its first flight the plane zoomed through the sonic barrier while climbing, even before the pilot leveled off. The Air Force rushed the plane into mass production, and today the F–102A is the backbone of the Air Defense Command. A later version, the F–106, with a more powerful engine, and even more area rule, is now coming off the production line at Convair.

Spectacular advances in the power of turboject engines had made supersonic flight for military aircraft possible; Whitcomb's area rule, for which he was later awarded aviation's coveted Collier Trophy, made it practicable. Area rule not only shoehorned the F–102A through the sound barrier; it supercharged the performance of many jet planes then in the building or planning stage. With area rule, Grumman's F–11F–1 Navy fighter pierced the sound barrier with a third less thrust than other airplanes of equivalent power. It boosted the speed of Republic's F–105 and Chance Vought's celebrated F8U Crusader and enabled Convair's sensational B–58 Hustler, our first supersonic bomber, to barrel along at Mach 2.

Along with these dramatic achievements of the last decade, other NACA scientists have been churning out useful information by the basketful. NACA men have charted the entire field of vertical takeoff and landing. Though many authorities consider the seaplane a duck of the past, NACA investigation continues, and it has helped Martin in the design of its giant, jet-powered seaplane, the P6M. Just completed is a massive study of ways and means to control fire in an aircraft crash. Other engineers have been conducting aircraft structural tests to make sure that our upcoming jet transports do not fail in flight like the original British Comets.

Yet I returned from my visits to NACA's laboratories with the uncomfortable feeling that the agency ought to be doing much more. Each new breakthrough in aeronautics opens up a new hornets' nest of problems that require skillful investigation. However, NACA lacks money, manpower, and equipment to meet adequately the demands of the jet-missile age. More advanced laboratory tools are required to explore fully the colossal problems of aerodynamic heating. A greater effort should be made in the field of exotic fuels, rocketry, and nuclear propulsion; but again it is a question of recruiting good people and building more sophisticated facilities. NACA's appropriations have increased from $24 million in fiscal 1946 to $71 million in fiscal 1958.

However, this increase has not been sufficient to keep pace with inflating salaries and the skyrocketing cost of complex equipment. For example, a modern wind tunnel in 1945 cost less than $1 million. Today, adequate wind tunnels cost more than 27 times as much. Now that vigorous steps are being taken to catch up with the Soviets in the missile field, NACA must have the tools it needs.

As Jimmy Doolittle says, "We have to plant the seed corn before we can harvest the crop."

Preparing for the Astronautics Age

Extension of Remarks of Hon. Peter Frelinghuysen, Jr., of New Jersey, in the House of Representatives, Monday, February 17, 1958

PREPARING FOR THE ASTRONAUTICS AGE

Approximately a decade ago Congress was faced with the problem of deciding how best to deal with the development of atomic energy. Should it be placed under military or civilian control? What type of agency was best suited to handle the problem? What role should Congress play in overseeing any program administered by the executive branch?

Today a similar issue is facing Congress, that is, how best to handle the problem of space technology. Should the Defense Department be given exclusive control in the field of astronautics, or should overall responsibility be placed in a civilian agency? If part or all of the program is to be placed in civilian hands, what agency should be given the responsibility? Or should a new agency be created? What should be the role of Congress in developing such a program?

BROAD SIGNIFICANCE

As was true with regard to the postwar debate on atomic energy development, Congress is beginning to realize that space projects will have significance far beyond the military area. For this reason there is a growing feeling that responsibility for development of our space program should not be left entirely in the hands of the Pentagon.

Unquestionably the development and operation of military missiles, military satellites, and military space vehicles are a military function—and a function which the Defense Department should push vigorously. In addition, however, much will need to be done in the field of scientific research on space phenomena, and scientific exploration of the universe. A sound national program must include both nonmilitary and military aspects.

In my opinion, there is, furthermore, real danger that the nonmilitary aspects of space technology will be submerged if they are included as a mere adjunct to a military program. If this be true, the question then arises as to what would be the best civilian agency to take on this responsibility—or what type of new agency should be created.

NACA

Few people have even heard of the National Advisory Committee for Aeronautics. Fewer still could describe its work. Yet this Federal agency, established in 1915, has played a crucially

important role in American aviation development. For example, NACA developed the laminar flow wing in time to enable P–51's to escort our heavy bombers into Germany at a critical point in World War II. It did outstanding work in the postwar period developing supersonic aircraft. It has solved key bottlenecks involved in the development of ballistic missiles. For more than a decade NACA has been conducting research in fields leading to man's conquest of space. Its work has, among other things, led to the development of the recently publicized X–15 aircraft. This is the plane which it is hoped will lead to manned flight beyond the atmosphere.

HARMONY

In all of these projects NACA has worked closely and in harmony with the military services, the scientific fraternity, and American industry. Its personnel is of the highest caliber. The chairman of NACA is Gen. James H. Doolittle, retired, who, in addition to his military fame, has an outstanding scientific and industrial record.

Considering these facts, it has seemed to me that NACA is the logical agency to be given the job of spearheading our space program. At the very least, NACA should form the nucleus of any new agency which might be developed. It would be a tragedy if NACA's large pool of talent and experience were wasted merely because its activities have not been sufficiently publicized.

In order to place this question clearly before Congress, I am developing legislation which would direct NACA to take overall charge of our astronautics program. This same legislation would establish a Joint Committee on Astronautics, made up of Members of both the House and Senate, which would act as a congressional watchdog over the space program.

This committee would be modeled after the Joint Committee on Atomic Energy, which oversees our atomic-energy program. The proposal constitutes an attempt to promote in the astronautical field this same type of productive legislative-executive relationship.

TOO SIMPLE?

Far too often when acute national problems arise Congress creates complex new organizations which add to the Federal payroll, expand Government bureaucracy, but do not effectively attack the problems they were created to solve. Today, faced with a serious problem, Congress and the President have a ready-made solution which would save the taxpayers money and get the job done. Let us hope the solution is not so simple that it is overlooked.

[Congressional Record, March 5, 1958]

SELECT COMMITTEE ON ASTRONAUTICS AND SPACE EXPLORATION

The SPEAKER. The Chair recognizes the gentleman from Massachusetts.

Mr. McCORMACK. Mr. Speaker, I offer a resolution and ask unanimous consent for its present consideration.

The Clerk read as follows:

HOUSE RESOLUTION 496

Resolved, That there is hereby created a Select Committee on Astronautics and Space Exploration to be composed of 13 Members of the House of Representatives to be appointed by the Speaker, 7 from the majority party and 6 from the minority party, one of whom he shall designate as chairman. Any vacancy occurring in the membership of the committee shall be filled in the manner in which the original appointment was made.

The select committee is authorized and directed to conduct a thorough and complete study and investigation with respect to all aspects and problems relating to the exploration of outer space and the control, development, and use of astronautical resources, personnel, equipment, and facilities. All bills and resolutions introduced in the House, and all bills and resolutions from the Senate, proposing legislation in the field of astronautics and space exploration shall be referred to the select committee. The select committee is authorized and directed to report to the House by June 1, 1958, or the earliest practical date thereafter, but not later than January 3, 1959, by bill or otherwise, with recommendations upon any matters covered by this resolution.

For the purposes of this resolution the select committee, or any subcommittee thereof, is authorized to sit and act during the present Congress at such times and places whether or not the House has recessed or has adjourned, to hold such hearings, to require the attendance of such witnesses and the production of such books, papers, and documents, and to take such testimony, as it deems necessary. Subpenas may be issued under the signature of the chairman of the committee or any properly designated chairman of a subcommittee, or any member designated by him, and may be served by any person designated by such chairman or member. The chairman of the committee or any member thereof may administer oaths to witnesses.

Mr. MARTIN. Mr. Speaker, reserving the right to object, and I will not, I understand this provides for the establishment of a committee similar to one already in existence in the Senate.

Mr. McCORMACK. The gentleman is correct.

Mr. MARTIN. Mr. Speaker, I withdraw my reservation of objection.

The SPEAKER. Is there objection to the present consideration of the resolution?

There was no objection.

The resolution was agreed to and a motion to reconsider was laid on the table.

APPOINTMENT OF MEMBERS OF SELECT COMMITTEE ON ASTRONAUTICS AND SPACE EXPLORATION

The SPEAKER. Pursuant to the provisions of House Resolution 496, 85th Congress, the Chair appoints as members of the Select Com-

mittee on Astronautics and Space Exploration the following Members of the House:

Mr. McCormack, chairman; Mr. Brooks of Louisiana, Mr. Hays of Arkansas, Mr. O'Brien of New York, Mr. Metcalf, Mr. Natcher, Mr. Sisk, Mr. Martin, Mr. Arends, Mr. McDonough, Mr. Fulton, Mr. Keating, and Mr. Ford.

Mr. BROOKS of Louisiana. Mr. Speaker, it is extremely important that we consider and pass this resolution at this time. Early in the fall I began to give to the press newspaper releases regarding the importance of establishing some definite basic principles in reference to the orderly handling of our progress into space in the future. On the first day of this current session I introduced a joint resolution which would have created a joint committee of the House and Senate to legislate on space matters. Since then, on February 10, after the Senate acted separately, I introduced House Resolution 474, which would create a space committee to handle space and astronautical matters coming before Congress and to establish rules and lay down patterns for work in this new sphere of activity.

It has been decided best not to take up my resolution but rather to put support behind the present resolution. I am, therefore, supporting the present resolution with all of the enthusiasm which I can command. It is important that we in the House proceed as the Senate has already pointed the way to an especial committee on the handling of space legislation and space matters which may come before us in the future.

Whether we like it or not, the world is now embarking on an entirely new era. In the days of Columbus, broad minds thought of the world as round and thought of the need of exploring and discovering all parts of the globe. Since 1492 tremendous progress has been made but it has largely been limited to matters on land and sea, and now there is no portion of the world that is not subject to being reached and explored and exploited by mankind. This means from the poles to the equator our people are able to move and explore and develop the world and its resources.

We are not set to enter an astronautical age. Our thinking is yet chaotic. We have established no definite patterns and our tools for this activity are indeed meager. With a rare sense of foreboding, the Russians following World War II seized upon the importance of developing space and astronautical activities. They have dumped in huge sums of money and employed their best minds and talents and have given the work highest priority for this development. We have developed the atomic bomb but our people have largely "rested on their oars" since this tremendous achievement of atomic energy. Now it is with the rude sense of awakening that we realize we have slipped from our position of superiority in astronautical development.

This resolution will create a separate House committee on astronautical and space matters. This committee is intended to function as an interim committee to organize the subject of the future control of space and the handling of astronautical matters, legislatively speaking. The committee will then make recommendations for the future which will be the guide and conduct of this Congress.

For 6 weeks the House Armed Services Committee has been listening to testimony on guided missiles. We have, in my judgment,

covered this field as carefully as a committee can within a limited time cover any field of activity which is technical in the extreme and which is entirely new to us. It is obvious, however, to any one listening to this testimony, both in open and closed session, that we realize the nation which properly controls space in the future will largely control the destinies of the world. From high elevated points above this globe instruments, and perhaps later manpower, in weird and new types of airplanes, rockets, and spaceships may have places of vantage unknown in the past, and operating from these remote positions will be able to photograph, investigate, and control the peoples of the nations of the world. We are told that trips to the moon and entering a satellite in the moon orbit is not impossible even within the near future.

I might go further in giving details in reference to this matter. As I stated, however, this is a new stage upon which the world is entering. Our thinking is still uncertain, disorganized and chaotic, but this committee would be in a position to organize our thinking legislatively to assist the executive department in a proper way and, looking ahead, to plan for that time when space travel and space military control will be an actual problem of the present.

Mr. Speaker, on last Friday, February 28, the National Broadcasting Co., Inc., produced a very fine program showing the need of scientific education to support this space program. At that time Vice President Richard Nixon; Senator Lyndon B. Johnson, majority leader of the Senate; H. Rowan Gaither, Jr., chairman of the committee which produced the Gaither report; Dr. James R. Killian, president of MIT; and Dr. William G. Carr, of NEA, appeared on the program and expressed themselves freely regarding the need of backing up such a scientific program with proper educational methods. WRC–TV was the premier in sponsoring and producing this fine program and this station is entitled to commendation for their enterprise and farsightedness in getting together such a splendid program. It takes vision, Mr. Speaker, to work "with your head in the clouds and your feet on the ground" and I know the country appreciated this program.

[Congressional Record, March 17, 1958]

The Task of the New House Select Committee on Astronautics and Space Exploration

Mr. McDonough. Mr. Speaker, the first official meeting of the House Select Committee on Astronautics and Space Exploration will be held Thursday, March 20. This meeting will be both historic and unique. Historic because it is the first time in the history of the Congress or the Nation that such a committee has been appointed to investigate, study and recommend action that Congress should take concerning astronautics or interplanetary travel and communications and the exploration of the vast expanse of space between the Earth and other planets.

It is unique because of the unusual responsibilities this committee is assuming in probing the mysteries of the vast unknown space and area between the Earth and the other planets in the universe. * * *

PRESENT PROGRESS

Much progress has been made up to now. Man can now fly at more than twice the speed of sound. He has reached the height of 102,000 feet, nearly 20 miles, and returned to earth in a balloon—Maj. David Simons, USAF, during 1957. Captain Kincheloe, USAF, flew the Bell X–2 to an altitude of 126,200 feet, and plans are under way for Test Pilot Smith Crossfield to fly the North American X–15 rocket to a height of more than 100 miles and return to earth which will be the highest elevation that man has reached.

We have shot United States satellite Explorer No. 1 to an elevation of 1,587 miles which is more than 500 miles higher than Russian sputniks 1 and 2, and have obtained sufficient scientific information to believe that it is feasible for a man-occupied satellite to travel to and exist at that elevation, and we have shot the Farside rocket from a balloon at an elevation of 100,000 feet to an elevation of 2,400 miles.

Although much has been accomplished since man's curiosity about outer space and the planets was aroused, there is a great deal more to be done. The following is part of an article from a recent issue of the U. S. News & World Report:

> Space flight by men, in vehicles that they can fly back to the earth at will, is within reach. It can be accomplished in the near future, Lt. Gen. Donald L. Putt, the Air Force Deputy Chief of Staff who commands development of new equipment, told a committee of Congress.
>
> At least three types of manned vehicles now are in the works. Two have small wings and will reenter the atmosphere by gliding into it to keep from being burned up by friction. The third, still highly secret, will use a new drag concept to reenter directly.
>
> Enormous satellites, weighing up to 2 tons, now are being built. Ground stations and equipment for them also are under construction. Total United States expenditure on this project, this year and next, is put at $150 million.
>
> "The first of these huge military satellites," General Putt revealed, "is on schedule for a first launch date in the very near future." The satellites are designed to carry radar and camera equipment to scan military preparations behind the Iron Curtain.
>
> First rocket to the moon will be fired this year, assuming that work begins on it within the next few weeks, the general said. Decision whether to spend money for this feat now is before Congress. The moon rocket is to carry instruments which will describe the moon's surface by radio.
>
> All these space ventures add up to a United States contest with the Soviet Union.
>
> Officials in Washington, relying upon intelligence information, say flatly that the Russians, like the United States, have had failures, both in missile tests and in satellite launchings.
>
> One report is that Soviet missilemen tried—and failed—to put up a 1-ton sputnik at the same time the United States launched Explorer I.
>
> United States officials believe the Russians have 4 major satellite projects planned for the next 6 months. Early on the list is an attempt to hit the moon. An attempt this year to launch

and recover a satellite with a man in it is thought to be among the Soviet goals.

Ambitious projects are springing up in both nations. What seems clear is that, despite failures to date, there will be many more rocket launchings in the next few months—a huge expansion of attempts to explore space beyond the earth.

FUTURE POSSIBILITIES

The following statement by Lt. Gen. James H. Doolittle, a pioneer in early aviation and a hero in World War II in his planned and successful attack on Tokyo from air carrier in the Pacific made this statement at the Aero Club of Washington, December 17, 1957:

> There has been exploration since the beginning of mankind, since the beginning of curiosity. The airplane has made well known most of the remote spots on this globe, but exploration will continue.
>
> The new exploration will be in science and in space.
>
> We, as a nation, must have vision and must work hard if we are to be leaders in this new type of exploration.
>
> I am a conservative, but I believe that before the end of the century the following events will occur and that they will occur more or less in the following order:
>
> A rocket will go to the moon. Somewhat more propulsive power will be required than for an intercontinental ballistic missile or for a satellite, but the guidance in actually hitting the moon will be easier than hitting a specific target from 5,000 miles.
>
> Scientific instruments will be landed on the moon. There is no atmosphere on the moon, so reverse thrust will be required in order that instruments may land on the moon lightly, softly. There may be deep dust on the moon, no one knows, so it may be necessary to send up several scientific instruments before one will operate.
>
> A manned satellite will go around the earth and will return to the earth. This will lead to the possibility of transcontinental or transoceanic travel in half an hour. San Francisco to New York, New York to London, New York to Paris—in half an hour. The determinant as to whether people travel this fast will be not technology, but economics.
>
> A trip around the moon and return; an opportunity, first to look at the far side with radar or television, unmanned, and then a trip around the moon and return to earth with a man aboard.
>
> A man will be landed on the moon and brought back.
>
> A space platform will be established.
>
> Instruments will be landed on Mars or Venus.
>
> A man or men will be landed on Mars or Venus and brought back.
>
> If I weren't a conservative, I would say that before the end of this century two more events will take place: A permanent observation station on the moon, and interplanetary travel as a common thing.
>
> This is only the beginning. What will happen next, I cannot even conceive. I am only sure that the rate of scientific progress will continue to increase.

The 8 or 10 things I have enumerated can be done. I am satisfied that before the end of the century—and maybe long before the end of the century—they will be done.

We, the United States of America, can be first. If we do not expend the thought, the effort, and the money required, then another and more progressive nation will. They will dominate space, and they will dominate the world. There is a nation with this ambition. We must not let it prevail.

THE LEGAL QUESTION

Among the many other problems in space travel and communication which the House Select Committee Committee on Astronautics and Space Exploration must attempt to solve will be the legal question of sovereignty, territorial rights, and jurisdiction.

This subject has been under consideration for several years. The following is part of an article on this subject from the March 1958 issue of the Air Force magazine:

> Since the invasion of space first by Russian satellites and now our own, there is growing sentiment for some sort of system of international control, or demilitarization. President Eisenhower has made a serious proposal to the world that this be done, and other administration and congressional leaders have done likewise. One proposal is that the United Nations form a special commission on space.
>
> Without questioning the worthiness, or even the ultimate necessity, of such a move, there are serious questions of sovereignty and international law involved.
>
> It can be logically argued that the International Geophysical Year marks the beginning of a new era in international law, holding that outer space is not a part of a nation's "airspace." This has been suggested by John Cobb Cooper, Canadian air-law expert and legal adviser to the International Air Transport Association. Cooper points out that neither the United States nor the U. S. S. R. asked permission to put satellites into space when they announced their IGY programs. The fact that no nation has protested the satellites' invasion of space, Cooper says, has already established a precedent for freedom of space. He interprets the present situation as follows:
>
> That present national boundaries extend upward only to a point where the atmosphere ceases to provide lift for airplanes or balloons.
>
> That outer space, which he defines as where there is not enough atmosphere to create drag or otherwise affect flight, is now beyond the sovereignty of any state or nation of the world.
>
> That the fringe area between these two still awaits a definition of sovereignty through some sort of international agreement,
>
> The desirability of a demilitarized space and its implications for a peaceful world is difficult to deny. But while the debate goes on, the United States cannot let space go by default to the Soviet Union.
>
> It is worth pointing out here that although the United States should work hard to prevent a Soviet monopoly on space achievements, deep space itself could not be the site of battle, as man

has always known it, between giant fleets or armies of opposing war vehicles.

Instead—as a battlefield—space would serve as the high ground for reconnaissance and missilry, as envisioned in the earlier suggestions of General Boushey.

As we approach the reality of space travel, the science-fiction buffs among us will have to leave much of our romance behind. For it would be difficult indeed, if not impossible, for great space fleets to meet in combat, unless they both left from the same place at the same time in the same predetermined paths. This is hardly likely. Otherwise, moments after they had "passed" each other in space, they would be thousands of miles apart, and the weapons, again in the classic use of the word, they ranged at each other would be utterly useless.

This does not, of course, preclude combat in near space between orbiting satellites of opposing nations. It would be possible, indeed quite simple, to demolish or puncture a manned satellite with a missile fired into its orbit. And there could, of course, be combat on the moon, a battle to gain sole control.

Dr. Edward Teller gave a hint of that prospect during his testimony at a recent congressional hearing. He was being asked why man would want to go to the moon. And he answered that it would be interesting to find out what was there.

Asked later what he thought we might find when we did get there, Dr. Teller answered, "Russians."

The United States must accept and mount the challenge to pioneer in the stupendous task of space exploration if we hope to overcome the Russian scientific advances. It will require great energy and the constant cooperation of our scientific manpower and industrial know-how, of which we have plenty to accomplish these objectives.

A Space Viewpoint We Still Need

[Congressional Record, March 10, 1958]

Mr. Rhodes of Arizona. Mr. Speaker, under leave previously granted, I would like to include in the Record the following editorial from the Phoenix Gazette of Friday, March 14, 1958, entitled "A Space Viewpoint We Still Need":

Within 2 weeks the space age, as dated from the first sputnik launching, will be 6 months old. A great many things have happened in that time. Perhaps the most significant of all—significant because our future hinges upon it—is the slow awakening of America to the real meaning of the space challenge.

The stunned disbelief which Russia's bold initial step into space produced in the United States 6 months ago has given way to a kind of we-have-to-get-on-with-it attitude which may prove to be the best thing for us in the long run. We know that we, like the Russians, can place earth satellites in orbit and we now know that many more of these vehicles will be orbiting the earth before another year is out.

We know that the space challenge is much larger than the mere launching of satellites. Most of us recognize that the next major task is that of placing a man in space and returning him safely to earth. And many of us are now capable of grasping the formerly strange idea that space travel

to the moon and to planets in our solar system is just a question of time and additional research.

This type of thinking represents a great change in our national viewpoint. And it offers a measure of certainty that we will not be caught short on space concepts in the future. But what has not changed, despite the events of past months, is our basic view of why these coming space feats must be performed and why this Nation must grasp and hold world leadership in accomplishing them.

We still think primarily in terms of military advantage when, in fact, we should be thinking ahead to a time when space travel will bear about the same relationship to the early satellite efforts that modern transportation bears to the invention of the wheel. Our destiny in space is not a military objective, although we will need the strongest possible space defense if we are to realize what lies beyond the pioneering stage.

Scientists know that answers to some of the world's most stubborn problems probably lie in space. Not directly in every respect, but in the scientific and technological advances which will carry us farther into space. The knowledge thus gained will reflect in every facet of civilization. Already our basic knowledge of such fundamentals as the effect of cosmic rays on humans and the extent of the earth's atmosphere have been extended by a single orbiting satellite.

These are needed facts. But they are nothing when compared with what can be gained in the future. In the field of technology the conquest of space on a large scale will offer the greatest industrial challenge this Nation has ever seen. New jobs will demand new skills. Employment in space-related industries could well pyramid to a tremendous economic force.

In education, in medicine, in commerce, law, the biological sciences, agriculture, and many other fields, the impact of space conquest will be a compelling force in the future. Some of these professions and activities seem far removed from the space race at present, it is true, but far-sighted men and women in all of them are beginning to grasp the new ideas which leaders in any field are first to comprehend.

The first 6 months of the space age should have taught us that nothing is impossible in these times. But until we begin to see the distant but no longer remote possibilities of this challenging new age, we are likely to continue thinking of it primarily as a necessary adjunct of cold-war strategy. This is true at the moment, of course, but even a cursory look ahead shows that in the conquest of space man may yet find a method for eliminating war, whether cold or hot.

SELECT COMMITTEE ON ASTRONAUTICS AND SPACE EXPLORATION

Mr. FRIEDEL. Mr. Speaker, I call up House Resolution 500 and ask for its immediate consideration.

The Clerk read the resolution, as follows:

Resolved, That the expenses of the study and investigation to be conducted by the select committee created by H. Res. 496, not to exceed $100,000, including expenditures for the employment of technical, clerical, stenographic, and other assistants and consultants, shall be paid out of the contingent fund of the House on vouchers authorized by such committee, signed by the chairman thereof, and approved by the Committee on House Administration.

SEC. 2. The select committee, with the prior consent of the executive department or agency concerned and the Committee on House Administration, may employ on a reimbursable basis if necessary such executive branch personnel as it deems advisable.

With the following committee amendment:

Line 1, following "That" insert "effective March 5, 1958."

Mr. MORANO. Mr. Speaker, will the gentleman yield?

Mr. FRIEDEL. I yield to the gentleman from Connecticut.

Mr. MORANO. The House Committee on Administration considered this matter this morning and was unanimous in reporting it to the House. I urge its adoption.

The committee amendment was agreed to.

The resolution was agreed to.

A motion to reconsider was laid on the table.

[Congressional Record, March 20, 1958]

AMERICA'S ROLE IN THE EXPLORATION OF OUTER SPACE

Extension of remarks of Hon. George Huddleston, Jr., of Alabama, in the House of Representatives, Thursday, March 20, 1958

Mr. HUDDLESTON. Mr. Speaker, shortly after Sputnik I made its surprise appearance in our skies last fall, Mr. Belton Y. Cooper, of Birmingham, Ala., came forward with a meritorious suggestion regarding our exploring of space. Mr. Cooper, one of my close friends and constituents, proposed that there be created a separate governmental agency directly under the chief executive to have charge of all research, engineering, development, and other matters relating to the exploration of outer space. He, in fact, formulated preliminary plans for an independent agency to be known as the National Astronautics Commission.

As Mr. Cooper's proposal was both sound and timely, we decided he should bring it to the attention of an engineering group of which he was a member to request their consideration. On Octover 24, 1957, the Birmingham chapter of the Alabama Society of Professional Engineers passed a strong resolution recommending that Congress set up the proposed National Astronautics Commission. The Alabama society followed suit on December 7, 1958, and forwarded its resolution to the national organization. On February 13, 1958, the National Society of Professional Engineers went on record to endorse the establishment of an independent Federal agency to be responsible for all matters pertaining to the exploration of outer space. Their resolution follows:

> *Be it resolved*, That the National Society of Professional Engineers recommends the establishment of an independent agency under civilian control and direction, responsible to the President of the United States, to assume direction of research, engineering, development, and procurement in connection with outer-space exploration.

Thus, we saw an idea conceived by an individual in my district receive the backing of a national organization.

(Note: The full text of the report appears in Compilation of Materials on Space and Astronautics, No. 1, p. 20.)

[Congressional Record, March 24, 1958]

Outer Space

Extension of remarks of Hon. Gerald R. Ford, Jr., of Michigan, in the House of Representatives, Monday, March 24, 1958

Mr. Ford. Mr. Speaker, under leave to extend my remarks, I would like to include two editorials from the March 17, 1958, issue of Life magazine. They are entitled "Outer Space: Let's Get There" and "Outer Space: How To Behave There." Reference is made in the second editorial to a suggestion by our distinguished colleague, the Honorable Kenneth Keating, wherein he is quoted as urging the United States to "take the lead in formalizing international recognition of freedom of outer space":

OUTER SPACE: LET'S GET THERE

Between these exciting countdowns at Cape Canaveral the United States should find time to reconsider its outer space adventure as a whole. Our plans and successes so far have been products of military technology. It was the United States Army's Redstone rocket, dressed up as Jupiter-C, that launched Explorer I, just 84 days after Secretary McElroy gave it the green light. The Air Force is now planning to orbit a manned satellite by 1962 or earlier. Military men are our most active space pioneers.

But this does not prove that only the Pentagon should continue to head our space program, or that we can rely on it to keep us in the race. It shouldn't and we can't.

Space is a new frontier for mankind (see following article). The services are paid to defend America, not to expand our human horizons. Their interest in space is necessarily limited by their capacity to envision a weapons system that uses it. And this inescapable fact is hampering our space efforts already.

To be concrete, the Atlas and Titan missiles require an engine thrust of less than 400,000 pounds to carry any amount of nuclear devastation to any part of the world. But to put a manned space observation platform in orbit would require something like a million-pound thrust and it will take us several years to develop such an engine if we start now. Said General Medaris recently, "Unless this country can command 1-million pounds of thrust by 1961, we will not be in the race." Yet neither Army, Navy, nor Air Force, concerned with practical weapons systems, can justify giving such an engine any real money or priority.

The conquest of space, however militarily important its coproducts may prove, is first of all an adventure of the human will and brain, Promethean in spirit. There is plenty of this spirit—as well as know-how—in the Army, Navy, and Air Force, but the services can never give it full play. Hence the need for a civilian agency. "The potentials of outer space," said Vice President Nixon last week, "are so vast and so illimitable that we must make positive plans to probe this potential in all its aspects. Control of space development by a military agency can

only mean that peaceful exploration of space will assume a minor role."

Two congressional committees are working on this problem and several existing civilian agencies are candidates for the control of our space program. The President's Advanced Research Projects Agency would be the logical candidate if it were not rooted in the Pentagon. Its new head, Roy Johnson, of General Electric, can perhaps win independent status for it. But whether he does or not he should get cracking at once on space projects, such as the million-pound thrust engine, which do not fit in any purely military plan but which are essential to an all-out space program.

OUTER SPACE: HOW TO BEHAVE THERE

The United States has a double responsibility in outer space. Not only must we extend our own exploration (see preceding article), but we must equip ourselves, preferably in cooperation with the rest of the free world, with some doctrine on how mankind shall behave there. President Charles S. Rhyne, of the American Bar Association, and several foreign statesmen, like Sir Leslie Munro, of New Zealand, have already proclaimed the need to adapt international law to the space age; the ABA has set up a space-law study group. It is not too early for laymen to ponder some rules of law for this vast new arena of human activity.

The problem is not without precedent. The last comparable expansion of the human horizon, Europe's discovery of America, led to the evolution of new international law. At first Spain claimed monopolistic dominion over much of the high seas and attacked English ships on sight. This came to be thought of as piracy and eventually the Spaniards were curbed. Ever since, at least in peacetime, we have had substantial freedom of the seas. The blue water is what international lawyers call res communis, common property. In Geneva this week lawyers from 87 nations are codifying and updating the law of the sea, cornerstone of civilization.

According to official United States doctrine, even some terra firma is also res communis, for example Antarctica. The United States has explored that region ever since whaling days, but has never claimed an acre of it. In fact, Secretary of State Charles E. Hughes in 1924 renounced United States chances of decently making such a claim. Today seven nations persist in claiming Antarctic territory, and some claims overlap. But the United States position, which recognizes no nation's claim and makes none, is sound international law and probably the best way to avoid conflict in the area.

For the air age, lawyers worked out a doctrine that treats the earth's atmosphere like national coastal waters. Any aircraft must get permission before entering the atmosphere over another nation. But where the atmosphere becomes too thin to support

aircraft, there (or thereabouts) begins space. And there must begin space law—or else chaos in the firmament.

When the Russians announced their intention to put up their sputniks to orbit in space past the territories of many nations, they asked nobody's permission. Neither did the United States before launching Explorer. And (except for dog lovers) nobody has protested. Why try to claim space that never stands still over any country? Thus a legal doctrine is already forming. Apparently, as long as satellites behave, they will be free to enter and orbit in space like ships at sea. This doctrine can be strengthened by treaty. Congressman Kenneth B. Keating, of New York, rightly urges the United States to "take the lead in formalizing international recognition of freedom of outer space."

It is almost time for an international conference on space law. The problem cannot be dumped on the U. N., to become just another cold-war wrangle. Some lawyers propose an international authority either to own all space ships or at least to license them and insure worldwide access to the information gleaned by them. Eisenhower's proposal to bar weapons from space is also a good subject for international agreement. And, when the first spaceship lands on the moon, should the crew plant a national flag? If so, should its claim be recognized by other nations? Surely it would be better if the home port on the ship's stern read simply and grandly, "Earth," rather than representing one of this puny globe's puny parishes.

Moscow may or may not agree with this: what matters more is to get agreement among the scores of civilized nations, old and new, who respect the idea of law and want to live by it. The United States has always lived and thrived in this tradition. Our present Secretary of State happens to be himself an international lawyer of renown. Surely we must not wait for him to work the moon into his busy itinerary. The United States must take the lead with some enlightened proposals for a space law for mankind. The lawyers in the State Department should get busy.

[Congressional Record, March 25, 1958]

ADDRESS OF THE VICE PRESIDENT OF THE UNITED STATES, AT THE ALL-CONGRESS DINNER OF THE 1958 NATIONAL NUCLEAR ENERGY CONGRESS AT CHICAGO, ILL., ON MARCH 19, 1958

Mr. FRELINGHUYSEN. Mr. Speaker, under leave to extend my remarks I should like to include an address of the Vice President of the United States at the all-congress dinner of the 1958 National Nuclear Energy Congress, Chicago, Ill., March 19, 1958.

As one who believes strongly in the importance of placing our space program under civilian control, I wish to call particular attention to the Vice President's remarks on this subject.

ADDRESS OF THE VICE PRESIDENT OF THE UNITED STATES, AT THE ALL-CONGRESS DINNER OF THE 1958 NATIONAL NUCLEAR ENERGY CONGRESS AT CHICAGO, ILL., ON MARCH 10, 1958

Six months ago on October 4, 1957, the Soviet Union launched its first satellite. This week the United States launched its Vanguard. With the race to outer space temporarily tied, numerically at least, at two each, this would seem to be an appropriate time to put the dramatic events of the past 6 months in perspective.

What are the lessons of the sputnik era for the American people?

First we must acknowledge that some of the initial extreme reactions were not supported by the facts. These conclusions, which some jumped to because of the shock of finding the United States behind in a major new area of progress, will not stand examination:

That the United States is now weaker than the Soviet Union.

That our scientists are inferior.

That our educational system is a failure.

Let us recognize at the outset these facts.

The United States with its free world allies is militarily stronger than any potential aggressor in the world.

United States scientists are the equal in quality of those of any other nation.

Our educational system has its weaknesses, but over all it provides probably a better education for more people than is available in any nation in the world today.

Let us turn now to some of our national reactions which were justified and healthy, in view of the challenge which was presented to us.

We have accelerated our ballistic missiles program. We are developing plans to reorganize the Department of Defense so that it can better deal with the problems inherent in the new dimensions of modern warfare. We have stepped up our program for the exploration of outer space. We have recognized the need for training more scientists and for improving our educational system generally.

These reactions were understandable and constructive. They do not need extended discussion before this audience. I suggest that we direct our attention, on the other hand, to some less apparent, but in the long run possibly even more important, lessons we should learn from the dramatic events of the last 6 months.

In increasing, as we should, our emphasis on training more scientists, we must not overlook the importance of making sure that our engineering education and practices keep pace with the increasing opportunities and complexity of modern scientific technology.

We must also recognize that we not only need science education for scientists, we need it for the general public as well. If our national scientific activity is to be maintained at an adequate level, the American people will have to have deeper motivations than a desire for foreseeable practical benefits, however important these

may be. The new age requires the achievement on the part of the public generally of a high degree of scientific literacy and the blending of science into our culture and way of life.

Increasingly major national decisions involve scientific and technological decisions. Obtaining adequate support for projects that have apparently military value is relatively easy. But we need a high level of public understanding to develop sound, national policies with respect to space science and exploration.

We also need such understanding to provide continued support for the instruments, institutions, and attitudes which will insure sound scientific progress. It is not that we want to make all of our citizens into scientists. What we must try to do is to provide for the nonscientists the insight and understanding with respect to science which we have historically sought to give to all of our citizens in the field of humanities.

One of our major needs is to develop a wider appreciation of the importance of the long-range benefits of basic research. The bad habit of coming forth with huge sums and crash programs only when outside events generate a sense of urgency is dangerously irresponsible. Basic research cannot be carried out on a crash basis.

We must not permit a few successes to soothe our injured pride and lull us again into complacency and a false sense of security.

For the past several months we have seen our scientists wined, dined, and publicized. But the heroes of today are too often forgotten tomorrow.

We Americans are a volatile people when it comes to issues which attract national interest. Seven months ago our primary concern was with inflation. From that issue we soared into outer space, parachuted into recession, and we now seem to be making our way to the summit.

The interest in outer space, as well as in the broader implications of scientific progress, is already beginning to wane. It is the responsibility of every knowledgeable citizen to keep this interest alive so that we can maintain the national effort upon which our security and continued progress depend.

Let us turn for a moment to our educational system generally. In recognizing its faults, let us not overlook its admirable features. Let us never forget that we have something better to offer than the Communist system of education with its overemphasis on scientific materialism to the exclusion of the humanities.

This is not the time to discuss in detail the needs of American education.

We need more classrooms.

We must improve the salaries, prestige, and support of our teachers.

But most important of all, we need to improve the quality as well as the quantity of education.

It is obvious in many schools that we need to put more fiber into our curriculums.

Soft subjects nurture flabby brains.

Students must be challenged to develop the intellectual disciplines that increase their value to the Nation.

We must challenge them with failure as well as success. Whatever the reason for automatic promotion, and there are several given, depending on the area problem, this failure to challenge should be eliminated. These are times when the American people must have the stamina and determination to overcome failure and achieve success in the manner that those assigned to the Vanguard project finally worked through to victory.

May I turn now to a very practical question: What type of Government agency should have the primary responsibility in the development of our outer space program?

There can be only one answer. We must not be limited by military needs or military thinking in exploring outer space, just as we are not so limited in developing nuclear energy.

Science is one of the great new frontiers of our time, and as such it provides our people with the opportunities and adventures which come with working at the frontier.

The adventurer along this new frontier is the basic research scientist who reaches into the unknown for the sake of knowledge. He seeks out the universe in which we live, as the adventurer of yesterday sought out new lands. Like the frontiersman of yesterday he explores the unknown for the sake of adventure as much or more than for the sake of gain.

The participants in our space program must be free to scout and explore, not mustered solely to man the frontier forts.

We must be motivated in developing our space program not by fear, but by the positive desire to explore one of the most challenging frontiers science and mankind have ever faced. The best way to insure that the scientist in this field makes the greatest contribution to the national welfare, including our missile program, to keep him free from the requirements of immediate military necessity.

Let us examine now some of the broader implications of man's breakthrough into outer space.

Who will win the military ballistic missiles race? The answer, of course, to this question is that in this race there can ultimately be no winners, only losers. Because it has become so obvious as to be almost trite to observe that ballistic missiles combined with nuclear warheads spell destruction of civilization as we know it.

The greatest lesson of the sputnik era, therefore, is in effect a solemn warning—find the road to peace or be destroyed.

The unqualified dedication of the Government and people of the United States to the cause of peace cannot seriously be questioned by anyone who knows our record in international affairs. But some of our friends, as well as our opponents, have questioned whether our policies are designed to further that objective. Let us examine some of the criticisms that have been made.

Why do we not accept the Soviet proposal for stopping atomic tests.

We cannot have honest disagreement over such issues as the extent of the danger from nuclear fallout if tests are not controlled, the possibility that secret tests may be able to evade an inspection system, whether testing is necessary for full development of the peaceful uses of atomic energy.

But let us have no illusions on the major issue.

Stopping tests is not in itself going to reduce the danger of war. The types of weapons already in production are adequate to carry out their mission of massive destruction. That is why control of production as well as tests of nuclear weapons, as the United States has proposed, is the only formula which goes to the heart of the problem.

The same considerations are involved in the United States position on disarmament.

There is no question as to our desire to enter into a disarmament agreement. The problem is securing an agreement that is enforcible because an agreement without adequate inspection provisions, which one party might honor and the other might not, would seriously and perhaps fatally increase rather than reduce the risk of war.

The American position on the summit conference fits into the same pattern.

I was asked just recently by a British correspondent, "Why is the United States dragging its feet on the path to the summit?"

Let us see exactly where the responsibility for delay belongs.

The United States, as President Eisenhower so eloquently said in his state of the Union message, is always willing to go an extra mile in attempting to reach agreements which will reduce the risk of war.

A summit conference which failed would increase rather than reduce international tensions. A conference which is not preceded by adequate preparatory discussions is doomed to fail.

The Soviet leaders are blocking the road to summit by insisting on conditions for a conference which they know and we know will assure its failure. They can prove their dedication to peace by agreeing that preparatory meetings should discuss the substance as well as the form of proposed agenda items.

Only in this way can the summit leaders be assured that they will be spending their time at such a conference in discussing subjects in which an area of agreement is possible, rather than participating in a propaganda exercise which would inevitably increase international tensions.

Let us examine the American record in international affairs as it bears on the sincerity of our devotion to the cause of peace.

Three hundred and seventy-eight thousand five hundred Americans died in World War I, World War II, and Korea. Since World War II we have given $64 billion in military and economic assistance to our allies and to our former enemies. In that same period we have spent $382.2 billion for national defense.

Why this huge expenditure of money and manpower?

Not because of our desire to gain domination over any other peoples or over a square inch of territory belonging to another nation.

It is the Soviet Union, not the United States, that has the blood of Hungary on its hands. Our sole aim in war and peace has been and is to assure the right of all nations to be free from armed aggression and foreign domination.

We recognize that the freedom and independence of others is the best guaranty of the freedom and independence of the United States. We are wholeheartedly supporting every international

organization devoted to the cause of peace. Our defense forces are designed for and will be used only to stop aggression, not to launch it.

Our record in the field of atomic power is one of the really exciting chapters in the history of man's quest for world order based on international cooperation and understanding. When we had a monopoly on the atom, every nation on earth knew that we would never use our awesome and unquestioned military superiority for aggression or for international blackmail. We offered to share peaceful benefits of the new source of energy with all other nations. As a result we have agreements with 40 nations for peaceful development of the atom.

Why then is there any question about the devotion of the American people and Government to the cause of peace?

It is a happy but sloppy cliche that our record speaks for itself. Because our record does not speak for itself.

It is cunningly twisted by devious masters in the art of propaganda.

It is warped and distorted to their purposes.

The less sophisticated peoples of the world are not told that we wage peace.

What they are told only is:

That we build thermonuclear bombs.

That our planes endanger lives by carrying deterrent weapons, even though that is all that confines Soviet aggression.

That our weapons tests threaten world contamination even though our tests are now primarily designed to remove the dangers of contamination.

Unfortunately, this is what much of the world believes. Even in the advanced countries that comprise western civilization this propaganda terror is having its effect.

What can we do about it?

We cannot use the Communist technique of the measured lie. The problem is to sharpen the truth into a weapon as effective and devastating as the Soviet lie.

Our Government information program must be adequately financed and staffed. But this task cannot be done entirely by Government, even though we were to enlarge our information agencies to match those of the Soviet Union.

One of the most effective ways is through expanding person-to-person contact and people-to-people understanding. I speak not only of those exchanges that are arranged and financed by Government. Even more effective are the activities abroad of some of the people in this audience—technicians, engineers, scientists, representatives of private industry, and foundations.

As a Government and as a people, we must wage peace not only in what we do but in what we say—the exploration of outer space for peaceful rather than military purposes, the development of nuclear power for peace rather than war, airpower for peace, science for peace.

All of these concepts must be reiterated again and again if we are to present to the world a true picture of American objectives in international affairs.

Our military power must be maintained at an adequate level to deter aggression. But here the fact of our power will speak for itself. Let us keep our powder dry, but the less we talk about it, the better.

In that connection, I might parenthetically suggest that, despite our understandable elation over the successful Vanguard launching, we might well practice more restraint in boasting about what our next exploit will be and when we will do it. A big achievement speaks for itself. It does not need a big buildup.

As those attending this conference are acutely aware, man's discovery of nuclear power can prove to be the greatest force for peace in world history.

There is the negative force created by the awful power of nuclear weapons which makes war less attractive to a potential aggressor as an instrument of policy. But more important in the long run are the positive forces which have been and will be unleashed by the development of nuclear power for peaceful purposes.

We have already harnessed the energies released by the splitting of the atom. Even now there are areas of the world where nuclear powerplants may be the most economical source of power. In a decade or two we hope that literally unlimited power sources will be at our disposal.

Obviously, if we contain, as seems possible, the even greater power of the fusion reaction, the limits of our achievement are beyond calculation. From the physical standpoint, at least, man will be the undisputed master of his universe. We can for the first time in world history wage a winning war on poverty and destitution, on hunger and disease.

In such an age the economic reasons for war will be removed. Because there will be energy enough to produce for the needs of all.

I do not suggest that the nuclear age can or will solve all the problems of mankind. World peace and even industrial peace depend on many factors.

Want and hunger are not the only causes of discord among men. But they rank high among the conditions that cause dissension and war.

If we can bring prosperity to the world, the chances for world peace would be immeasurably enhanced.

On December 2, 1942, from the city of Chicago, Dr. Arthur Compton sent to Dr. Conant the dramatic message that was to signal a new era for man in war and peace, "the Italian navigator has reached the new world."

What kind of a world Enrico Fermi had reached is in our hands to decide.

No group in the world can affect more the outcome of this decision than those gathered in this room tonight because as you developed unlimited power for peace you provide for mankind the means with which he can finally eliminate the cause of war.

SPACE AND THE U. N.

Extension of remarks of Hon. Alvin M. Bentley, of Michigan, in the House of Representatives, Tuesday, March 25, 1958

Mr. BENTLEY. Mr. Speaker, under leave to extend and revise my remarks, I wish to include the text of an editorial from the issue of March 19 of the Washington Post and Times Herald entitled "Space and the U. N." The editorial appropriately calls attention to the fact that, in calling attention to the control of outer space to be discussed in the General Assembly, this is the first time that the Soviet Union has advocated working through the U. N. and indeed comes at a time when they are actually boycotting other U. N. agencies. In other words, the Communists only use the United Nations when it suits their specific purpose to do so.

The editorial follows:

SPACE AND THE U. N.

There is some merit to the Democratic criticism in Congress that the administration missed a bet in not officially proposing United Nations control of outer space. The invocation of the U. N. in the new Soviet plan linking control of outer space with abolition of foreign bases unquestionably gives the Kremlin's overture a propaganda appeal which it might not otherwise enjoy.

This is both unfortunate and unnecessary, because there have been plenty of individual American proposals for dealing with space problems through the U. N. President Eisenhower's several discussions of peaceful use of outer space have not been specific on the means, but Senate Majority Leader Johnson was explicit on use of the U. N. The president of the General Assembly, Sir Leslie Knox Munro of New Zealand, has long advocated a U. N. approach.

Perhaps the administration was afraid that more particular mention would become mixed up in the propaganda for a summit conference; or perhaps the failure was sheer inertia. In any event there was strong reason for this country to press ahead with a plan, as in the case of the International Atomic Energy Agency, whether or not the Russians agreed. The Kremlin is adroit enough in turning American suggestions to its own purposes that the President and Secretary Dulles—who have been keeping American policy very close to their chests—should have been on guard.

Still, the Soviet gain, if any, may be of a short-range nature, and we wonder whether it is so brilliant as some persons seem to think. If there really is a chance of instituting practical methods of control through the U. N., it will not really matter who gets the credit. But if the Soviet proposal is mere camouflage—as suggested by the extreme distortion of the American plans for control of intermediate- as well as long-range missiles—this will become apparent soon enough.

It is noteworthy that this is the first time in recent memory that the Russians have advocated working through the United Nations. They flouted the international Organization on Korea

and again on Hungary. Right now they are boycotting the U. N. Disarmament Commission at the same time that they are calling for discussion of space control in the General Assembly. The Russians have never looked upon the U. N. as an instrument for settling big disputes, and the suddenness of their apparent conversion raises considerable question as to its sincerity.

Nevertheless, the proper answer from the United States is to welcome this part of the Soviet proposal—quite apart from the question of bases which is not negotiable in such a context—and to seek to put it to a test in the United Nations. If they are sincere, splendid. If they are not, and are using the proposal for propaganda in the gamble that the American response will be negative, the best way to expose their hand is to call their bluff.

WAS SPUTNIK REALLY A SURPRISE?

Extension of Remarks of Hon. James G. Fulton, of Pennsylvania, in the House of Representatives, Tuesday, February 25, 1958

Mr. FULTON. Mr. Speaker, was the launching of sputnik a complete surprise to the United States Government?

I have received an interesting letter from Mrs. Mary Fogiato, of Bridgeville, Pa., who asked the question which I am sure millions of Americans have been thinking about. In order to be helpful to Mrs. Fogiato I requested an answer from the Department of Defense as to whether we were aware of Russian activities in the missile field which indicated a potential capability to launch an earth satellite.

I am submitting for the Record the letter received from the Department of Defense in answer to Mrs. Fogiato's letter:

OFFICE OF THE SECRETARY OF DEFENSE,
Washington, D. C., March 20, 1958.

Hon. JAMES G. FULTON,
House of Representatives.

DEAR MR. FULTON: Reference is made to your communication of February 28, 1958, attaching a letter from Mrs. Fogiato, of Bridgeville, Pa. The Assistant to the Secretary of Defense for Legislative Affairs has asked me to comment on this letter for you.

Mrs. Fogiato asks whether or not the Soviet satellite launching came as a complete surprise to the United States Government. It did not. We were aware of certain Soviet activities in the missile field which indicated a potential Soviet capability to launch an earth satellite. However, until the act was accomplished, we could not be certain that this capability was anything more than potential, as was ours. The Soviets themselves most likely felt similarly about their own earth-satellite program until the earth satellite was actually in orbit.

Thus, although the launching did not come as a complete surprise to officials of this Government, any prior public statement as to when the Soviets would launch an earth satellite would have been but mere speculation. I should add, however, that both United States and U. S. S. R. intentions in the earth-satellite field have been a matter of

public record since mid-1955, at which time each announced its plan to attempt to launch an earth satellite during the International Geophysical Year (July 1, 1957–December 1958), an international scientific endeavor in which both countries are participating.

Sincerely,

G. B. ERSKINE,
General, USMC (Retired), Assistant to the Secretary of Defense (Special Operations).

SPACE PHYSIOLOGY

Extension of remarks of Hon. Roland V. Libonati, of Illinois, in the House of Representatives, Tuesday, March 25, 1958

Mr. LIBONATI. Mr. Speaker, in view of the scientific interest manifested by our Government in all matters concerning space control, together with such factors, physiological and psychological, that may affect its research and development, a scientific paper given by one of the greatest scientific physiologists in the world on the subject of "Space Physiology" was presented at the annual meeting of the Medical Research Association of Southern California, at Los Angeles, January 16, 1958, by Dr. Andrew C. Ivy, professor of physiology and head of the Department of Clinical Science, University of Illinois College of Medicine. Certainly in this scholarly discussion of this intricate scientific subject, his ideas, based upon a thorough knowledge of the subject and its related sciences, is invaluable. I am proud to present this interesting work to the Members of the Congress, as follows:

SPACE PHYSIOLOGY—PHYSIOLOGICAL MAN VERSUS HIS TECHNOLOGICAL TWIN

(By A. C. Ivy, Ph. D., M. D., D. Sc., LL. D., F. A. C. P.)

INTRODUCTION

Research in space physiology is a serious business. Research in physiology is generally conducted to increase our understanding of the way the body functions, to maintain health and to prevent and cure disease. But research in space physiology today is to protect the "physiological man" from the attack of his predatory "technological twin."

Let us recall that aviation physiology was conceived and developed by the exigencies of World Wars I and II. Its brother, space physiology, was conceived and has been developing as a result of the question: Which of two ideological groups on the earth today is going to control space?

The answer to this question has called space travel and space physiology to the forefront. As a result of the launching of Sputniks I and II, the subject of space travel and space physiology has become mixed up with military strategy, long ranged ballistic and guided missiles, with the educational system of our

country, and with the politics and economics and peace of our own country and of the world. (Even the antivivisectionists have entered the arena.)

Fortunately, the achievement of the Kremlin has alerted many leaders to the growing smugness, softness, and mañana attitude in our country. Many educators have observed, since about 1935, a growing tendency of high school and college students to avoid the hard courses in science and mathematics and to select the easy and amusing courses and activities. This is not the fault of our young people. It is obviously the fault of our parents and educators. Many parents want their children to have an easier time than they had "getting ahead." Entertainment is preferred to work to an excessive extent.

Science is hard. Scientific research if you really like it and work at it is rough and a stern taskmaster. There is no glamour in science for 90 percent of those who are working in the field. If one does not have a zeal to do research and to like it and to do hard and frequently disappointing and unrewarding work, he should not take up scientific research. And the development of long-range rockets and missiles, of satellites and spaceships is the most expensive and toughest research ever attempted by man.

INTEREST IN SPACE TRAVEL STARTED IN 1948

In 1948, the first symposium in the United States on space travel was held under the auspices of the United States Air Force at the School of Aviation Medicine, Randolph Field, Tex. The engineering and physiological aspects of the subject were presented and discussed by men with much experience, including the producer of the German V–1 and V–2 rockets. In addition, the United States Air Force had as a consultant the German general who had the complete responsibility for the development of the German rockets during World War II.

Thus, in 1948, the United States of America possessed as good brains and the most experience on the subject of rockets as existed in the world at that time. In 1948, a few leaders of intelligence and foresight in the United States Air Force and, to a lesser extent in the Navy, had assembled everything that was required to produce better and better rocket missiles, and to place a small satellite in an orbit by 1955, except the money.[1]

One of the discussers at the 1948 symposium remarked: "No commercial concern, not even Hollywood, had the money required to develop rockets and space travel; and the only way that the money might be provided was by the United States Government under the demands of war because history records that no democratic government in the past has spent large enough sums to maintain the peace against a predatory enemy. Nevertheless, it is now (in 1948) obvious that the Kremlin as long as it is controlled by Communist ideology will continue to be a predatory enemy. It is now (in 1948) obvious that the Kremlin is going to develop the rocket as a long-range missile because they have

[1] General Schreiver, of the Air Force, stated in 1956 in testimony before a Senate committee on January 10, 1958.

moved to Russia most of the German rocket-producing personnel. Rockets have captured the imagination of the Russian militarist because during the war (World War II) their artillery had used rocket cannon.[2] Let us hope that their manifest attachment to rockets does not lead some of their predatory leaders to the idea that he who rules space will rule the world."

IN 1948 SPACE TRAVEL WAS ONLY A TECHNOLOGICAL PROBLEM

In 1948 the production of long-range missiles and the launching of a satellite was not a basic scientific problem. The basic scientific problem had been solved. It was only a technological-engineering problem. Much research and very expensive research and development, of course, had to be undertaken. It would be the most expensive single research and development program ever undertaken by man with the possible exception of the total expense involved in the application of atomic energy for use in war and peace. The experiment showing that atomic energy could be released under controlled conditions did not cost much. But, the research to apply this basic scientific result to everyday life will cost billions. And, it was chiefly under the impetus of a "hot" and "cold" war that money has been provided for the rapid development of the peaceful applications of this newly discovered source of energy.

In 1957, the problem of space travel or the establishment of a space station is still a technological-engineering problem rather than a problem of basic science.

WHY THEN NOT A SATELLITE LAUNCHED IN 1955 OR 1956?

It was a matter entirely of military strategy. The prime question was: Where could the money obtained from Congress for the defense of the United States of America be spent most efficiently?

To understand and clarify all the confusion in the press and magazines caused by the launching of Sputnik I and II it is necessary to understand and carry in mind the military strategy of the United States of America and Russia and the interrelation of aeronautics to ballistics, and aeronautics and ballistics to astronautics. Russian military strategy and the interrelation of aeronautics, ballistics, and astronautics are briefly outlined in appendixes A and B, but you should have clearly in mind the differences between the two strategies.

UNITED STATES MILITARY STRATEGICAL PROGRAM SINCE 1947

1. (A) Short-range encirclement of Russia with aviation bases on land, aircraft carriers, and submarines equipped with long-range bombers and missiles carrying atomic bomb warheads for a retaliatory attack.

(B) Protect the United States of America from a sudden all-out attack by long-range Russian bombers with atomic bombs by

[2] In 1903, the Russian scientist, Konstantin E. Tsiolkovski, was the first to investigate the possibility of using a rocket for space flight.

constructing a radar screen from Alaska to Greenland, and by producing short-, medium-, and long-range missiles.

(C) The wide dispersion of jet fighters, bombers, and land bases, aircraft carriers and submarines would prevent their complete destruction by a sudden attack.

2. It is significant that the Russians started a rocket development in 1945–46 where the Germans left it. (See appendix A, the Kremlin Strategy). Although the Air Force was ready to start a rocket and space program in 1947, it was not actually started. But, the United States Army was permitted to start rocket development in 1951 in a meager way at the Army Ballistic Agency in Alabama. Apparently rockets were considered at the time to be missiles primarily for Army use. This Army rocket program was reviewed in 1953 and intensified in 1954; that is, just 3 years ago. * * *

The Vanguard program was later cleared for a special open satellite project on the advice of a commission of scientists because it was believed desirable to release information regarding it to scientists of other nations for exchange purposes.[3]

To launch a small satellite requires a rocket with only about 10 percent more velocity than a missile which travels to a target 5,000 to 6,000 miles distant.

I believe the military strategy of the United States of America (and of the Kremlin) has been wise on the basis of the money appropriated. And, let us not forget in the midst of the coming debate in Congress that a single B–52 jet bomber can carry more destruction than was carried by all the bombers during the 4 years of World War II. But, it would appear that in 1955, Congress and the public should have been told about the progress the Russians had been making with rockets. Then, the responsibility of appropriating more money to the defense program would be placed where it belongs.

WHY INVESTIGATE SPACE PHYSIOLOGY

Why attack the problem, why investigate space physiology unless it may be useful in arresting a predatory enemy and in daily peaceful living? It is futile, of course, to try to predict all of the uses which may be derived from a new development or way of travel. But from a military viewpoint an unmanned satellite with a good TV-camera and transmitter could serve as a reconnaissance satellite, or eye in the sky. It could also serve to improve the accuracy of long range missiles. It could be equipped to provide more information regarding weather prediction and control. A man-piloted satellite would multiply many fold the reconnaissance and discovery values of a manmade satellite. But, its greatest boon to man would now appear to be to provide the means for weather control and a better understanding of the solar

[3] This provided the Russians with exact information regarding where the United States of America was in her satellite program and informed Russia that if she would hurry up, she could be the first to launch a satellite. The scientist in charge of the United States of America satellite program stated that the Russians had acted unethically in launching Sputnik I. Can it be that the American scientist is so ignorant of Marxian communistic lack of morality to believe that it is unethical for the Kremlin to break a contract? Expediency is the only ethic of Marxian communism.

system in which he lives. The power to control weather from a space ship can also be used by an enemy to destroy nations.

THE OBJECTIVE: A MAN-PILOTED SATELLITE

Space physiology is involved in the problem of launching a satellite because the only satisfactory objective is a man-piloted satellite which can be regularly launched, controlled and guided in space and brought back to a predetermined landing strip.

Major General Dornberger has estimated that given 5 to 6 billion dollars this objective could be accomplished in 10 or 12 years.

THE MAJOR DEVELOPMENTAL STEPS

Let us summarize the logical major steps to be taken.

The first step has been taken. We now know that a small satellite can be placed in an orbit.

The second step is to place a man in a capsule in a rocket and have the capsule ejected and descend with parachutes from 100 to 200 miles up. This would be preceded by tests with a dog in a capsule which have been done.

The third step would be to place a dog in a capsule, in a small satellite at a level of 300 miles, and then eject the capsule at an appropriate time so that the capsule with parachutes would descend at a predetermined site.

The fourth step would be to place a man in a capsule in a small satellite at a level of 300 miles, and then eject the capsule at an appropriate time so that the capsule with parachutes would descend at a predetermined site. This would provide us with an escape device in case a satellite or space ship were to get into trouble. The man could bring back information of various types with him.

The fifth step is to produce an automatic satellite so that at a predetermined time the satellite will gradually approach the earth and finally land at a predetermined site. This automatic satellite will have a nose and shell which will not ignite on slowly reentering the air at high speeds. Such a nose and metal, the United States now possesses. Russia apparently does not.

The sixth step would be to produce an automatic biosatellite by placing a dog in an automatic satellite and bringing it back to earth in good condition.

The seventh step will be to produce a small automatic and man-piloted satellite. It would carry 2 or 3 men and return.

The eighth step, the ideal, would be to have a sufficient store of clean atomic energy aboard ship so that one could leisurely fly around the world several times in order to attain the escape speed of 25,000 miles per hour, then use some of it to accelerate or decelerate in approaching the moon or planets, and then return to the earth, using energy appropriately to decelerate from 25,000 miles per hour to 150 miles per hour. This space ship would essentially be a jet aircraft with 2 sets of jets, 1 (a rocket) to accelerate and 1 (a retro-rocket) to decelerate the ship with a large supply of clean atomic energy for fuel.

VELOCITIES REQUIRED TO ESTABLISH AN ORBIT

The velocity required to escape from the gravitational pull of the earth is 7 miles per second or 25,000 miles per hour at a distance of 600 miles or more away from the surface of the earth. It is possible, however, to place a satellite in an orbit at a speed of 5 miles per second or 18,000 miles per hour at a distance of 125 miles from the surface of the earth. At a speed of 18,000 miles the centrifugal force balances the gravitational pull of the earth. The speed of 18,000 miles per hour can be attained at an elevation of 125 miles because there is no atmospheric or air drag. At the speed of 18,000 miles per hour, gravity is neutralized and objects or persons in the satellite are weightless.

Sputnik I and II were launched at a sufficient height and at a sufficient speed to place them in an orbit. But, their speed and distance from the earth was such that they were subject to the earth's gravitational pull. So, they slowly approached the earth's atmosphere and were or will be burned up. Sputnik II at the narrowest portion of its orbit was only 300 miles away though at its widest it was 923 miles away. One part of its orbit was in space and a part of the gravitational field of the earth. Furthermore, its velocity was only 17,840 miles per hour. Sputnik I's orbit was more round than that of Sputnik II, and that is why Sputnik II will have a shorter life than Sputnik I had.

No rocket tried out to date has given a satellite a speed of 25,000 miles per hour at a distance of 600 miles from the earth.

THE RATE OF INCREASE IN SPEED OR ACCELERATION OF A ROCKET REQUIRED TO LAUNCH A SPACE SATELLITE

The rate at which the rocket increases its speed from 0 to 25,000 miles per hour is critical for the engineer and for the physiologist. The engineer desires to get the greatest efficiency possible from the fuel in his rocket. The physiologist knows that if the rocket accelerates too fast it will injure a living passenger, especially a man.

When a three-stage rocket is used, the first stage starts firing and the rocket rises at first slowly and then more and more rapidly. By the time the first-stage fuel is exhausted, the rate of increase of speed is 9 times the g. or the normal pull of gravity. The first stage is ejected and the second stage starts firing but the acceleration drops back to 1 g. and then works up to 8 g. Then the second stage is ejected and the third starts firing and the acceleration drops back to 1 g. and then increases to 3 g.

The first increase in g. from 1 to 9 occurs over a period of 90 seconds, the second from 1 to 8 g. occurs over a period of 120 seconds, and the third from 1 to 8 g. occurs over a period of 90 seconds. These changes in acceleration may occur over a period of from 5 to 8 minutes.

With conventional fuels the time required to increase the speed of a potential satellite from 0 to 25,000 miles per hour is about 8 minutes. This would amount to an average rate of acceleration of 76.7 feet per second. That is, every second on the average the

satellite would move 76.7 feet faster than it did during the prior second. Since 1 g. is equivalent to 32 feet per second, the average rate of acceleration over the period of 3 minutes would be 2.4 g., with a range of increase from 1 to 9 g.

CAN MAN TOLERATE THE RATE OF ACCELERATION NOW REQUIRED TO LAUNCH A SPACE SATELLITE?

During and since World War II the effect of acceleration on the human body has been studied intensively. This is because a pilot going at a high speed will "black out" or "red out" (become unconscious) if he turns the ship too rapidly. The pilot becomes unconscious because the blood is either pulled out of the head ("black out") into the legs and abdomen or pulled into the head ("red out") depending upon the pilot's position. The problem of acceleration has also been studied in relation to ejection seats. [The ejection seat is located in a capsule. The capsule is so fixed to the plane that when it becomes necessary to escape, the pilot, seat, and capsule is suddenly catapulted from the jet plane. The capsule then either falls free or more slowly on a parachute to an altitude of 10,000 or 12,000 feet, when the capsule opens and the pilot descends on his own parachute.]

Pressure suits have been designed and used to decrease the pooling of blood in the legs and abdomen or to increase the g. tolerance. But, without a pressure suit most healthy persons can tolerate 2.5 to 3 g. indefinitely. In the supine position, 10 to 14 g. can be tolerated. Even though the person does not black out, he is immobilized except for operating a lever or pushing a button. This means that until the satellite is launched, its operation will be automatic.

So, the problem of g. tolerance is well understood. The engineers, however, are limited to moving the man-carrying satellite into its orbit to a period of not less than 8 or 9 minutes. Dogs and monkeys have withstood such acceleration forces. A monkey survived a rocked flight to 40 miles above the earth in 1952 in the United States of America. A Russian dog has been ejected from a rocket 23 times without suffering injury according to Russian reports. But, these animals are not as susceptible to g. as is man.

For purposes of illustration we shall use the phony report of January 3, 1958, that a Russian in a capsule was carried to 186 miles by a rocket after which he safely parachuted back to the earth. When this occurs, we shall have concrete proof that acceleration is not an important problem, as we now firmly believe. This would also prove that the capsule was not excessively heated during ascent and descent, that the apparatus keeping the man in the capsule warm during descent did not fail, that the hermetic seal of the capsule had not been broken during ascent and descent, and that the oxygen supply and the performance of the parachutes were adequate.

If we can believe the report of the Russians regarding "muttnik" then the physiological engineering problems associated with ascent in an ejectible capsule placed in a space satellite have been solved.

PROBLEM OF ATMOSPHERIC PRESSURE

The satellite cabin will have to be hermetically sealed and pressurized for ground level. The seal will have to withstand the strains applied to it by the maximum thrust of the rocket. Within a few minutes the satellite cabin will be exposed to almost a perfect vacuum (1 particle per cubic centimeter).

If a minute leak should occur, pressurization could be accomplished by carrying some compressed air for the emergency. The flight is over if the leak cannot be promptly found and repaired.

VENTILATION AND OXYGEN SUPPLY

In a man-piloted satellite it is believed that 175 cubic feet (15 cubic meters) of space should be supplied for each human occupant, and that 3 occupants will be required. If the satellite is automatic, then one man would be adequate. The air will have to be mechanically moved because there will be no convection currents in the absence of gravity. The CO_2 and body moisture will have to be removed by chemicals or freezing.

Oxygen requirement of the body would be minimal because of the absence of gravity. This would amount to about 360 liters per day for the average person, or 500 liters as a maximum. As the oxygen is used it would be replaced by a supply of liquid oxygen. One liter of liquid oxygen would yield 860 liters of gaseous oxygen, which would supply the need of an average person for 2 days. A 5-gallon bottle of liquid oxygen would supply 1 person for 40 days.

For long trips some very efficient method for producing oxygen would be required. It has been reported (Dr. Jack Meyer, University of Texas) that 60 gallons of a suspention of an algae (chlorella pyrenoidsa) would produce the O_2 needed and use up the CO_2 produced by 1 man every day. The algae could be fed with chemicals and the waste matter produced aboard. The efficiency of this method has yet to be studied in relation to the efficiency of liquid oxygen.

TEMPERATURE CONTROL

The physiological tolerances to temperature are well known to physiologists and engineers. So, this is entirely an engineering problem. During the first minute of ascent the temperature of the shell of the satellite will increase several hundred degrees centigrade. The outer shell of the satellite will have to be well insulated from the interior occupied by a dog or a man. After launching, the only source of heat will be solar radiation. Since the solar radiation will not be filtered by an atmosphere, the exposure to heat and ultraviolet light will be intense on the side of the satellite exposed to the sun. The side not exposed to the sun will be extremely cold. Since the interior temperature of the satellite will be well insulated from the heat and cold, the heat on the solar side may be reflected or stored at will. Some storage may be required to maintain heat when the satellite is in the shadow of the earth or moon.

The extreme cold and heat on the opposite sides of the satellite will provide the source of electrical energy since when a junction of two different metals is formed and one is kept cold and the other hot, an electric current flows and this energy can be used or stored.

RADIATIONS

Considerable concern has been expressed about the possible hazard of unfiltered cosmic rays and solar radiations of various types, such as heavy protons. But as evidence from balloon studies has accumulated it has been concluded (Dr. Heinz Haber, University of California at Los Angeles) that the hazard of cosmic radiations is not forbidding especially for flights of short duration. The extent of this hazard can only be determined by experiments on animals kept in an automatic biosatellite for several weeks or months.

WEIGHTLESSNESS

The only condition that will be encountered by man in a space satellite regarding which it is practically impossible on the earth to obtain much information is the effect of weightlessness on physiological mechanisms.

This is due to the fact that at the present we have no method for producing a complete state of weightlessness for more than 20 or 30 seconds at a time. Numerous methods have been suggested, such as free fall in an elevator or from a springboard to a swimming pool (20 seconds duration), and floating in a deep pool of water with an oxygen supply without the hands and feet touching bottom for traction.

These methods do not adequately simulate the conditions in a space satellite, and provide no information regarding the prolonged effects of weightlessness over several days or weeks. This information can be obtained only by an actual experiment in space, preferably in an automatic manned satellite. Some information could be obtained from a man in an ejectible capsule in a rocket satellite.

Much indirect information is available to indicate that weightlessness constitutes no hazard and that adaptation to such a state may occur rather rapidly. Weightlessness may also be compensated for by mechanical devices, if necessary.

The heart will have less work to perform because it will not have to overcome the weight of the blood. There is no conceivable reason why the respiratory, digestive and excretory machinery of the body should be disturbed.

Locomotion and sense of position of the body in space will be altered. If one moves an arm or leg in space, there is no feeling of weight. This is similar to the eye muscles: they work against friction and tension, but not gravity, and do their work most precisely and accurately.

In this connection we should recall that there are two types of sensory-motor pressure systems in the body. One is affected by gravity, the other is not.

Gravity sensory-motor system: A gravity sensory-motor pressure system is found primarily in the skin. It has been known for 30 or 40 years that this system may be blocked by local anesthesia, and that movements of precision may be made, especially when the eyes are open.

Another gravity sensory-motor pressure system exists in the otolith mechanisms of the utriculus and sacculus of the vertibular or body balancing apparatus. In the absence of gravity, these two organs will not function. The semicircular canals will function, because they are stimulated by inertia or acceleration effects.

If the utriculus and sacculus on one side is destroyed, a rather marked disturbance of body balance occurs. But, if both are destroyed, the effect is slight, if any. Any disturbance is compensated for rather quickly.

Nongravity sensory-motor systems: There is a pressure system not directly affected by gravity in the muscles and tendons and deep tissues and some abdominal viscera. This sensory-motor system is directly stimulated by stretch and tension independent of gravity. Gravity may and frequently does serve in conjunction with stretch and tension to influence this sensory-motor system. Gravity, however, is not required for its functioning. To be specific, the knee kick reflex would occur in the absence of gravity, and would, of course, be decidedly exaggerated because gravity would not counteract the extension of the leg.

In the absence of weight the sense of position of the arms and hands and legs and feet, and of the body would be impaired but still present. With practice, movements of precision could be made by the arms, hands, or legs, especially with the eyes open. A sensation of being seated, even with the eyes closed, would exist. With the eyes closed, you could still touch your nose, but unless careful when you lifted your arm, it would shoot over the head.

Precise movements will be controlled to great extent by the eyes.

Fish can make adjustments to optical orientation in space. If a glass-bottomed aquarium is covered by a blackboard, and light is directed into the aquarium only from the bottom and aeration is provided from the bottom, the fish will soon be swimming upside down.

There can be no reason to doubt that man can readily adjust to almost solely optical orientation in space.

In difficult cases such as rapid walking, a magnet may be attached to the shoe soles. Magnets may assist other situations. Even a small rocket gun might come in handy.

But, unless the manned satellite can afford to carry some heavy gyroscopes, every movement will have to be made with caution to prevent the satellite from being deviated from its astronautical course or orbit. Unless gyroscopically controlled, a mouse can rock a space satellite.

In the case of a space station, it has been suggested that it could be built like a wheel and then rotated about a hub. Occupants would then walk on the side of the rim of the wheel as though it were the ground.

FOOD AND WATER

Food and water would be conserved according to the amount of storage space. Storage space would limit the extent of the time of the space travel because it would place a limit on the amount of food and liquid oxygen which could be stored. Much space for water storage would not be required because water can be recovered quite economically.

It is of interest to point out that water would not pour out of a glass because of absence of gravity. It would have to be sucked out.

METEORITES

The only presently known problem posed by space travel that cannot be solved is the catastrophe of explosive decompression due to a collision with a meteorite.

There are two general types of meteorites: the macrometeorites and micrometeorites.

The macrometeorites are like those which are large enough to enter the atmosphere of the earth and cause a flash of light or strike the ground. Quite obviously there is no possible protection against these except to try to see them coming with radar outfit and then to dodge them. However, the chance of striking one of these has been stated to be less than a disabled airplane over the Atlantic has of hitting the steamship *Queen Mary*. The chances of being hit by a very small meteorite is greater; some have estimated a chance frequency of once a month. Swarms of small meteorites will have to be looked for by radar and avoided by an appropriate change in the course of the space ship.

It has been estimated that a 10-milligram micrometeorite on striking a steel plate could develop 2,400 horsepower in 1 second. It has been suggested that the space satellite should carry a micrometeorite bumper. The bumper would consist of an outside shell filled with devices or material to plug the conical hole formed.

A space station could be built in compartments like a seagoing ship, so that one compartment may be destroyed without destroying all.

The meteorite is a calculated risk that one has to take just as one does when one drives an automobile; when one rides in a vehicle, one takes a risk of the occurrence of hazards beyond his control. What these risks actually are can only be ascertained by sending up a number of automatic space satellites.

He who conquers space will be he who is willing to pay the price. If the Kremlin pays the price first, the spoils will go to the Kremlin.

There is still a lot of adventuresome, tough and stern, courageous and determined individuals in the United States of America. But, we must keep in mind that, although Russia is historically old, the Kremlin and the group supporting its power are also adventuresome, tough, courageous, stern, and determined—also ruthless. This thought should keep us alert and pushing ahead with the determination that the good and right way of life shall survive.

EXCERPTS FROM THE CONGRESSIONAL RECORD FOR THE EIGHTY-FIFTH CONGRESS, SECOND SESSION, THROUGH APRIL 14, 1958, PERTAINING PRIMARILY TO OUTER SPACE

UNITED STATES SENATE

[*Congressional Record, January 9, 1958*]

Proposed Joint Committee on Earth Satellites and the Problems of Outer Space

Mr. Javits. Mr. President, I submit a concurrent resolution providing for the establishment of a Joint Congressional Committee on Earth Satellites and the Problems of Outer Space. A companion resolution has been submitted in the House of Representatives by Representative James G. Fulton, of Pennsylvania.

The Presiding Officer. The concurrent resolution will be received and appropriately referred.

The concurrent resolution (S. Con. Res. 53) establishing the Joint Committee on Earth Satellites and the Problems of Outer Space, submitted by Mr. Javits, was received and referred to the Committte on Armed Services, as follows:

(See bills and resolutions introduced in the 85th Cong., 2d sess., through March 24, 1958, pertaining primarily to outer space, p. 314 of this report.)

Mr. Javits. Mr. President, such a committee would parallel the Joint Committee on Atomic Energy, which we have found it desirable to create, and would be a proper vehicle for providing the necessary bridge between Congress and the Executive on matters affecting outer space and earth satellites.

The space age is here. The world has been catapulted into the space age by the challenge of the Russian earth satellites and our determination to meet their efforts.

A new field has been opened up whose impact on our civilization shows tremendous capabilities for good or evil, for progress or annihilation. It is essential that the United States get and keep leadership in developing outer space so that the tremendous gains possible in this area may be gains for peace, and that our satellite, when launched, may be a symbol of peace and a star of hope.

Mr. President, I emphasize the fact that that is not an exclusivist position for us to take, but that we must do it with all humility in association with our allies, in regional organizations, and in the United Nations, as well as with all other free peoples, in our determination to make our great reserves serve all mankind.

The best interests of the United States and the free world now require joint and continuing congressional study in the problems of

outer space, and congressional oversight of the plans and programs upon which our national survival may depend.

Our Preparedness Subcommittee is to be complimented for the objectivity and the vigor with which it is proceeding at the present time in approaching this problem.

Before conflicts in jurisdiction among legislative committees arise on the numerous bills introduced on these matters, it will be best to settle this question by establishing a joint committee.

This measure for a joint committee calls for the appointment by the Vice President of 7 Members of the Senate, and for 7 from the House of Representatives, to be named by the Speaker of the House. In each instance, not more than four shall be members of the same political party.

It is planned that the joint committee shall make continuing studies of the activities of the various Government departments, services, and commissions, and of private and international agencies relating to the development, use, and control of earth satellites and similar mechanisms, and shall make continuing studies of the problems of outer space. The Department of Defense would be called upon by the proposed resolution to keep the joint committee fully informed with respect to all matters within the Department relating to earth satellites and outer space. The legislation also would call on any Government agency to furnish information requested by the joint committee with respect to the activities or responsibilities of that particular agency in the field of earth satellites and outer space.

[Congressional Record, January 16, 1958]

NUCLEAR PROPULSION

Mr. ANDERSON. Mr. President, the people of America have so much interest in the possibilities of a satellite, a space ship, or even a long-range intercontinental ballistic missile that I feel it important that there be some discussion of the progress we are making in the general field of nuclear propulsion as it might be related to missiles or satellites.

To begin, we would of necessity be discussing what has been called Project Rover. This is the code name for our project for nuclear rockets to propel long range missiles and possibly satellites. I want to make an attempt to indicate what happened to slow down Project Rover, why we are not making very much headway in the study of nuclear propulsion as far as missiles, airplanes, and satellites are concerned, and what we may do to increase the tempo of our activities in this very important field.

This is not an attempt to become involved in arguments as to the politics that may, or may not, be involved in nuclear propulsion, I am going to try to recite the facts, and people can make their own political conclusions from them. Personally, I think we will be better off if we avoid some of the political discussion that could be indulged in, and devote our time to deciding what steps America must take if we are not to lose both the psychological and the military values that are involved in this whole program.

I want to go back to July 1956. At that time Project Rover was adequately financed for the ensuing fiscal year 1957, involving many millions of dollars for construction and operations.

I might say that it is a little embarrassing to keep saying that it was adequately financed by a satisfactory number of millions of dollars. I regret that it is not possible to break down the classification placed on this program, so that the American people may get some idea of the size of the work involved. The program carries a classification tag, even though it seems to me we are not fooling anyone with it but the American people.

We had had a problem in the Joint Committee on Atomic Energy. The Atomic Energy Commission had appeared in a special meeting in late June, had testified that it needed some additional money for construction, and had received over $9 million in additional funds through the following steps:

On June 22, 1957 the Atomic Energy Commission came up before the joint committee, at the AEC's own request, to ask for the added $9 million which they said was urgently needed to push ahead the Rover program. In response to this urgent plea the joint committee immediately approved authorization of the extra funds and I remember that I personally made a special visit to the Senate Appropriations Committee the same day, I think it was a Saturday, to ask that the money be made available to AEC. The Appropriations Committee duly approved this request and the money was appropriated.

I cite that because there are some people who say that Congress is responsible for the slowdown of many of these projects. The Atomic Energy Commission came before us at a special meeting one morning, and it placed its recommendation before the Committee on Appropriations the same day.

It is my understanding that the initial AEC request for operating funds for fiscal year 1957 was cut down by about $4 million. Of course, we were then going through a period of study, and were attempting to learn what the future of nuclear propulsion would be insofar as ballistic missiles and satellites might be concerned.

At that time, Mr. Eger Murphree, connected with the Standard Oil Company of New Jersey, was a guided missile czar. At least that was his title. He appointed a committee under the chairmanship of General Loper, who is chief of the Military Liaison Committee. There were 10 members on the committee:

Herbert B. Loper, chairman, Nuclear Rocket Propulsion Committee, Assistant Secretary of Defense—Atomic Energy.

J. B. Macauley, special assistant to the Assistant Secretary of Defense—Research and Development.

J. H. Sides, rear admiral, United States Navy, Deputy to the Special Assistant to the Secretary of Defense for Guided Missiles.

Dr. Clark Goodman, assistant director for technical operations, Atomic Energy Commission.

A. R. Luedecke, major general, United States Air Force, chief, Armed Forces Special Weapons Project.

Leland S. Stranathan, major general, United States Air Force, director of development planning, DCS/DEV.

D. J. Keirn, major general, United States Air Force, chief, Aircraft Reactors Branch, Atomic Energy Commission.

Dr. Herbert F. York, director, University of California Radiation Laboratory, Livermore.

Dr. Homer J. Stewart, California Institute of Technology.

Mr. Allen F. Donovan, Ramo-Wooldridge Corp.

The terms of reference of the Loper committee were to determine the prospects of meeting the original requirement for testing the rocket's nuclear powerplant by a certain date within the next few years. The exact date, I am told by the Defense Department, must still remain classified. It is a little difficult to show how this subject was postponed; nevertheless, it is still classified.

The Loper committee made a report and I am not desirous of questioning in any way the wisdom of that report. I do, however, point out that they indulged in a somewhat difficult task. They were charged with the responsibility of determining the prospects of the application of nuclear propulsion to an intercontinental ballistic missile, and to discharge that responsibility, the committee felt that its members should compare the potentials of nuclear propulsion and chemical propulsion devices, which might become available in the same time period. That was a pretty tough assignment.

We knew a lot about chemical propulsion because we had had a good many tests of small chemical devices, and when the Loper committee attempted to predict from these early tests what the properties and capabilities of a superchemical fuel might be in a couple of years, there was no assurance that the estimates were to be correct. The committee members merely did the best that they could to determine what might be the final estimate of propulsion by a superchemical not yet developed, and the qualities of which were not known.

On the other hand, they also had to estimate how nuclear rocket propulsion might work. And this was a shot in the dark. We had never attempted to develop the extremely high temperatures which would naturally accompany nuclear propulsion. Likewise, we had no device in which we had tried to check its lift properties. So in the end, the Loper committee had to guess how a nuclear rocket propulsion device might work. And I do not criticize it for guessing, because that was the purpose of its appointment. In any event, the Loper committee concluded that the AEC should engage in a "prompt effort to demonstrate the technical feasibility" of the project by a specified date within the next several years and should continue at the then existing rate and scale of effort.

To illustrate the difficulty, I was discussing the subject with an expert who had participated in the work, and he said to me, "We were asked to compare oranges with lemons, even though we had never seen the lemons."

At an earlier time in one of our hearings, I developed the fact that project Rover, which is the nuclear rocket propulsion project, was decelerated by the Department of Defense, and that it was the decision of Mr. Murphree to cut back the Rover program even before a formal Loper report was issued. This was discussed at a meeting of the Joint Committee on Atomic Energy on January 28, 1957.

I therefore wish to point out that Mr. Murphree, who had spent his life with chemicals and chemical fuels, and gasoline and similar substances, cut back project Rover before the Loper committee had given him advice as to whether or not project Rover should be cut back.

I think we need to bear in mind that the decision of Secretary of Defense Wilson did not carry out the recommendation of the Loper committee. In fact, General Loper was not even consulted before the decision was made. The report was ignored by Mr. Murphree and a letter, dated January 12, 1957, was prepared to the AEC for Secretary Wilson's signature which largely negated the original requirement which had been received from the Department of Defense, and established a requirement to demonstrate the feasibility of nuclear propulsion for an application not yet really known. No time was indicated when this should be done, and the words "a modest effort" were used instead of the recommendation that it be done promptly. In other words, there is a big change from a prompt determination to a modest effort to check it out.

The Department of Defense could help clear up this whole situation if it would release the Loper report. I believe that the original requirement was to demonstrate the feasibility of an engine involving nuclear propulsion on a short time scale. I think that the present goal is far from that. We hope to see a first preliminary test of one of the devices in the next year or two and if it works, we can then proceed to move on to other tests. It will be well into the 1960's before there is a real test of the powerplant that might be used in nuclear propulsion. In any event, the target dates for the project have had to be moved back—and by that I mean delayed—at least 2 years, and maybe more.

This cutback had its significance in the dollars that were assigned to this sort of work. The flow of fiscal 1957 funds for AEC work in nuclear rocket propulsion was held back by the Bureau of the Budget pending the Loper report. That meant that from July 1956, until January 1957, the Bureau of the Budget withheld almost all the operating and construction funds allocated for this work. This involved many millions of dollars. Now they allowed some money during this holdup period. They allowed the AEC group interested in the rocket program to go ahead on a month-to-month ration, but they were not allowed to spend any of the construction money, except $1 million, which went into the laboratory at Livermore, Calif., and there was a little money that went into the design of certain facilities for the Nevada Proving Grounds. But this money for design work was in reality wasted because AEC could not subsequently use the plans which had been prepared and had to junk them and take an entirely new set of plans and go to work.

In the early part of January 1957, the Bureau of the Budget on the basis of the letter from Secretary Wilson saying that "a modest effort" should be made, reduced the construction funds $10 million from the total appropriated by the Congress and approved by the President. Well, a million dollars had already been spent at Livermore, so that had to be subtracted from the remaining funds. The operating funds at that time were cut by nearly $6 million. That, of course, meant that the work could not proceed at both Livermore and Los Alamos, and the AEC therefore had to choose the laboratory that seemed to have the most capability and the best approach to the problem, and cut out work on project Rover at the other laboratory. The decision was reached to go ahead at the Los Alamos Scientific Laboratory and assign certain other work to the Livermore laboratory. There just was not enough money for both laboratories to operate, and I

want to suggest now that I think it would have been well if both laboratories had been allowed to proceed.

Anyhow, Project Rover was assigned to the Los Alamos Scientific Laboratory the end of January 1957, and another related project under a classified code name was assigned to Livermore.

I regret that some newspaper people have cited to me the code name, but I still cannot use it. Incidentally, this is a very promising project, and nothing should be allowed to interfere with the progress that is being made and can be made on that. The money that had been spent at Livermore, and the group of people who had been brought together for Project Rover at Livermore were identically the kind of facilities and the types of people needed in this other classified project and, therefore, the effort which was going on at Livermore on Project Rover could be, and was, successfully and properly diverted to work on this project, and this was done and I think successfully.

The budget for fiscal 1958 did not allow any more funds for construction for Rover because of the late date of getting started on the 1957 funds. Obviously, since the Atomic Energy Commission could not commit all these funds in the few remaining months of fiscal year 1957, asking for more funds for fiscal year 1958, which obviously could not be spent, would have been a little absurd. The AEC was allowed an operating budget for fiscal 1958 which was a little less than that for fiscal 1957. The ground rules for 1959, which were indicated to AEC, were that efforts were to be carried on at approximately the same level as 1958. The net result has been the moving back or delaying of the target date for demonstrating of feasibility by at least 2 years from that which was set out in the directive to the Loper committee.

Now I have had it reported to me that the AEC had planned to accelerate the Project Rover expenditures and had planned to use for fiscal 1958 about $20 million more than has actually been allotted. I believe that the planning experts, or those in charge of the program at AEC, would admit that that was about the 1958 figure which they hoped to reach. Of course, Livermore was included in the program at that time and when the Bureau of the Budget clamped down unilaterally in January 1957, AEC's original planning figure was completely unrealistic and, therefore, it had to be abandoned.

I know we have a fiscal 1959 budget before us, and I suppose that the dollars for the Rover program will be carried in that somewhere and will be revealed in time to the Joint Committee on Atomic Energy and to other proper members of the Congress. But it undoubtedly will not request added authorization for construction money because the original authorization which was in the 1957 budget has never been withdrawn from the books. The AEC has a $10 million authorization left over from the previous cutbacks, and if they go ahead with their present plans, this construction work will probably stay well within the authorization figure.

I do not wish to be understood as saying that there are no other funds for the nuclear propelled rocket program because the Air Force does have some money for this purpose. In 1957 it was authorized to spend a few million dollars and then again in 1958 an additional few million dollars on the studies and development of airframes, tanks, pumps, and so forth, associated with the nuclear propelled

rocket. AEC will probably not have the responsibility for the airframe that undoubtedly should belong with the Air Force, but these groups have been working well together, and I think that they will probably continue to get along very nicely.

The important point for some of us to remember is that a missile to go to the moon, for example, or a vehicle to travel in outer space, cannot just be suddenly concocted out of a bucket load of chemicals. I do not hesitate to say that on the basis of information I have gathered from scientists, I do not believe we will ever have a missile capable of going to the moon and back again unless it be nuclear propelled. Bear in mind that it will take about 3 million pounds of lift, according to those who have done some calculating, to get off the ground a missile that is capable of going to the moon. If that estimate is accurate, we now have no engines that will give anywhere near that amount, even when you group a great battery of them together in a single device like the Atlas, and if we cannot get more than that from the Atlas engines, we would surely have a hard time in building a chemically fired engine that would give a lift of 3 million pounds. So when people talk about putting manned missiles or space vehicles on the moon, they are probably talking about waiting until we attain nuclear rocket propulsion, and that is why it is important to speed up nuclear propulsion in this country.

I cannot speak here of the comparative strength of a nuclear engine of this size because the lift of our largest chemical rocket engine is still classified.

Mr. GORE. Mr. President, will the Senator yield?

Mr. ANDERSON. I yield.

Mr. GORE. Does not nuclear energy possess certain other characteristics which chemical fuels do not possess, and which would cause it to be an effective—perhaps the only effective—source of energy to be used in the areas beyond the earth's atmosphere?

Mr. ANDERSON. Yes. I may say to the Senator from Tennessee, who has certainly been a diligent member of the committee in trying to examine these questions, that it possesses certain qualities which are very valuable.

Many of us who have been down under the sea in the *Nautilus* were impressed by the fact that the *Nautilus*, once launched under an icecap, can navigate under it for months, if need be, before returning to discharge its passengers.

One man in the *Nautilus* said, one evening, when a group of us were aboard, "If you wanted to test the real capability of the *Nautilus*, the only thing which need ever bring it back to harbor would be the necessity for allowing the sailors to reenlist." The *Nautilus* could stay under the sea, as it has done, and cross the oceans indefinitely.

The same general qualities apply to a nuclear-propelled projectile, when we once have it. We will not only put it up in the sky, but we will be able to keep it there for a long time, if we desire to do so.

Furthermore, in the case of intercontinental ballistic missiles, we all recognize that if a missile is to be fired with a relatively low trajectory and is designed to hit a target of an area of only 5 miles, the problem is much more difficult than one in which the missile can be tossed into a higher trajectory and be brought down again, as in the case of a nuclear rocket.

Anyone who doubts this should try to toss a basketball into a wastebasket.

This high trajectory possibility has attracted the attention of scientists who are greatly interested in nuclear propulsion for the intercontinental ballistic missile. There are other interesting situations which arise in connection with the ICBM—and to which I shall refer later.

A three-stage weapon is a very cumbersome object to put into the air. Its weight—that of the heavy warhead and the three heavy engines—is so great that the delicate machinery inside might have a tendency to fail. One little valve caused trouble in one of our missiles the other day.

The Senator from Tennessee knows that there is hardly a part of the *Nautilus* which was not built in duplicate. That was to make certain that the *Nautilus* would continue to traverse the ocean. Then a path was laid out for it once it was under the water. There is a great factor of safety built into it by extra parts.

A great factor of safety was built into every atomic bomb I ever looked at, and certainly in every hydrogen bomb, so that if one system of ignition failed, something else would be there to do the job.

But we cannot afford to follow that practice in the case of a chemically-fueled intercontinental ballistic missile. As I say, the problem is so great that we can have one chance, and one only. If a single valve fails, as it did a short time ago in one of our tests, the whole missile fails.

A nuclear-propelled device would be wholly different. Extra safety factors can be added, if desired. By a small change in the fuel supply of the nuclear element, it can be made certain that the lift will be tremendously increased. Therefore, the possibility exists that guidance systems can be added which will be far more cumbersome and far heavier than the guidance systems we are now talking about.

Mr. GORE. Mr. President, will the Senator yield?

Mr. ANDERSON. I yield.

Mr. GORE. I said earlier on the floor that I agreed with the statement which President Eisenhower made in his state of the Union message that this country had failed to see the political and psychological effect of the Russian breakthrough in launching a satellite. That has an important effect.

We might as well acknowledge that the Russians have stolen a march on the United States; that they have beaten us to the launching of a satellite by means of chemical propulsion.

Overtake them we must. But there is not so much drama, there is not the impact on world opinion involved in overtaking the Russians in a similar launching that there would be in leapfrogging the Russians, so to speak, and beating them to the launching of a manned satellite or space vehicle with controlled mobility.

Mr. ANDERSON. I could not agree more with the Senator. Furthermore, I might point out that at one time the Air Force had placed upon it the responsibility for a part of the program in this country for the development of plans for a large space satellite. I understand that one of our Government officials, when asked about this project, which had the code name "World Series," said he had never heard of it. I can only say that I had heard of it, and that many others who are interested in this program had heard of it.

It was a program which proposed that ahead of the schedule of the Russians, we have put into the heavens a satellite which would have carried a payload of at least 200 pounds. That included scientific equipment. At a later time, a satellite would have been launched carrying a payload which may have run from 1,000 to 5,000 pounds.

I think it is too bad that we did not do that. But, as the Senator from Tennessee has pointed out, having failed in that regard, we will not have very much psychological advantage if we put into orbit something which weighs only about 1,100 pounds, as the Russian satellite does. We must talk about something else, it seems to me, which will have far greater possibilities.

If we could utilize some of the genius which I think we still have in this country, we might be able, as the Senator says, to leapfrog to these accomplishments.

I refer now to a talk I made at Rochester, N. Y., a couple of years ago to a conference on high energy nuclear physics. During the afternoon I had an opportunity to visit with a number of scientists who had been associated with the Los Alamos Scientific Laboratory, some of whom I had met at the time they were at Los Alamos. I stopped a scientist and asked him if he had any regrets about the period of time he spent on that rocky cliff at Los Alamos.

"Oh, yes," he said, "very great regrets, because as we went down the main highway, determined to build a bomb, we saw so many other interesting side roads we would have liked to follow, most interesting paths leading off into the most scientific, entrancing possibilities. But we had to push them away, forget them, and go on to the main goal, which was the bomb."

One of the interesting and fascinating side roads they would have liked to follow was the possibility of putting a satellite into the sky. Ideas were conceived then which I believe should have been followed.

But I want to return to my statement that, in my belief—and this is not the estimate of scientists; it is just from my own discussions with men who are scientists—it will take 3 million pounds of lift to put on the moon a space vehicle which might be brought back. We do not have any means by which we can do that unless we use nuclear power.

So when men talk about putting space vehicles on the moon, they will probably have to wait until nuclear propulsion can be attained.

If we think that there are certain psychological advantages in space travel, interplanetary travel, and journeys to the moon or in the setting up of space platforms, then by all means we should be pushing the work in the development of nuclear rocket propulsion. Some persons have the idea of placing in the sky a great space platform. If we proceed by means of nuclear propulsion, rockets will probably be used in that connection; but nuclear propulsion must be used.

Furthermore, there is a possibility, and I list it only as a possibility, that we may find that even a 5,000-mile intercontinental ballistic missile will have to be nuclear propelled if it is going to have great reliability. I can conceive of our learning that the Atlas and Titan, well-designed though they may be, will have some possibilities of failure, and will not be as reliable as we want them to be. We just cannot send up missiles with nuclear warheads unless we

are sure they are going to reach the target for which they are intended and will not drop onto some friendly land between America and the target zone. So we shall want to be careful that each will reach its intended target.

Therefore, in order to press forward vigorously and effectively in developing nuclear rocket propulsion, we need a program that has clear objectives, even if they cannot be too precise at this stage of the game. We also need clear lines of authority and steady support for the program, so it can be pursued to a successful conclusion at the earliest possible time.

In brief, I hope we do not get into the same fix we have been in for over 10 years with the aircraft nuclear propulsion program. Beginning with the old NEPA project in 1946, the ANP program has been characterized by ups and downs in funding, by on-again-off-again planning, and by an administrative setup that has been just short of chaotic at times. So far as I can see, there never have been any real clear objectives, nor have the contractors been able to find out where the program is going from year to year. In 1953, Secretary Wilson attempted to kill the project outright; but thanks to the intervention of the Join Committee on Atomic Energy—and particularly through the efforts of Melvin Price and the late Carl Hinshaw of the other House—it was kept going somehow. After 10 long years of this merry-go-round, it now appears that the project is once again getting back on its feet. But it has been a long and costly wait.

The point is that if we really need nuclear-rocket propulsion for missiles and for space travel—and I think we must have it—we are going to need some clear-cut objectives to aim for and a well-administered program to see that we get these promptly. Prospects of developing space platforms and taking trips to the moon give a whole new dimension to our life, and we must be prepared to cope with the situation.

One of the most important factors in connection with whether we succeed or fail in this new era is how well we organize and conduct our scientific development efforts. It seems logical to me that since flight into space will require some form of nuclear propulsion, one alternative to be considered is to have the Atomic Energy Commission and some of its laboratories, such as that at Los Alamos, take on the development job. This would have the advantage of utilizing going organizations who are familiar with the kind of work which will be required.

Another alternative would be to set up a separate Government agency under civilian management, in which centralized responsibility would be vested, for space development plans. Such an agency could proceed to coordinate scientific efforts on space development throughout the country and overseas, and undertake the construction of facilities for its own research and development work.

At this point, Mr. President, I ask unanimous consent to have printed in the RECORD, at the end of my remarks, an excellent study on the formation of a "Space Commission" and a prospective on Space Research in Operation, which were prepared by a special committee of the Los Alamos, N. Mex., chapter of the Federation of American Scientists.

Mr. President, I wish to say that these came about in a strange fashion. I got together a group of perhaps a dozen scientists who are very much interested in this field. I asked them, "If you were to handle it, if you were the responsible agency in Washington, and if you were given the task, how would you go about setting it up?"

They said, "Come back later."

When I returned, later, they had prepared the material which I now submit. It gives their viewpoint. It is not necessarily the final one. But whatever the steps which are taken, I would expect that the Joint Committee on Atomic Energy will be taking an active and continuing interest in this matter.

The PRESIDING OFFICER (Mr. Clark in the chair). Is there objection to the request of the Senator from New Mexico? Without objection, it is so ordered.

(See exhibit A.)

Mr. ANDERSON. Mr. President, this subject is not new with me or with the other members of the Joint Committee. Back in June and July of 1955, I sent to the President two letters, cosigned by the junior Senator from Washington, Mr. Jackson, who is chairman of the Military Applications Subcommittee, emphasizing the importance to the Nation's future strength and security of a vigorous program—on a wartime footing—to develop an operational ICBM at the earliest possible moment.

On April 6, 1956, I spoke to the Sixth Annual Conference on High Energy Nuclear Physics, at Rochester, N. Y., and I should like to quote several comments from that talk:

From page 4:

> Moreover, we should not restrict ourselves merely to consideration of hazards implicit in wars of annihilation with atomic weapons. In technology applied to military ends, novelty is ever a prime goal.

From page 10:

> We may think of climate control or worldwide weather modification. Recent advances in meteorology suggest that efforts in this direction may produce useful results some time in the future.
>
> Another example on a large scale which inevitably crosses national boundaries is the project to send a rocket into outer space. Purely from a geographical viewpoint, efforts to send missiles and ultimately passengers to the moon and the nearby planets are of worldwide interest.

Mr. President, that was in April 1956—some time ago. At that time I received some interesting comments, as a result of that discussion. The text of my remarks was sent to all the members of the Federation of American Scientists; and there came to my office hundreds of letters suggesting that something should be done. After much consultation with members of the joint committee, Senate Resolution 295 was prepared. It proposed that the United States spend some time in this field, and that perhaps we set up a world laboratory to work on this outer-space problem or at least on such research.

In the normal course of events the resolution was referred by the Presiding Officer of the Senate to the Foreign Relations Committee. It requested the viewpoint of the Department of State. I ask unani-

mous consent to have printed in the RECORD, at the conclusion of my remarks, the text of Senate Resolution 295; the report of the Department of State; and particularly the statement by the majority leader, as made a few days ago, which I thought very fine.

At that time—in 1956 when Senate Resolution 295 was introduced—the Department of State said:

> As to the establishment of a world laboratory, experience indicates that greater promise lies in national efforts developed on a cooperative, or better still on a coordinated basis.

The PRESIDING OFFICER. Is there objection to the request? Without objection, it is so ordered.

(See exhibit B.)

Mr. ANDERSON. Mr. President, in the course of my remarks at Rochester, N. Y., in April 1956, I also said:

> While the intensely nationalist feelings characterizing international relations on our planet at the present time suggest that we may even see, as a result of interplanetary travel, an extension of the competitive colonialism which the last century saw for the backward areas of this planet, the prospect of seeing different sections of Mars staked out by different national governments of this earth seems on the face of it ludicrous. Are we trying to play God and develop a new planet in our own image and likeness? A much more rational and probably more productive basis for the exploration and development of other worlds would be under an organization which properly reflects the common interests of all the peoples of this earth in such development. The Man in the Moon belongs to the children of every country, is a part of their dreamworld, and if reached by space ship, might better remain the property of all.
>
> Returning now, however, from the fanciful and the future to the more immediate problems of initial efforts to get a space ship away from the earth, we recognize hazards of a rather severe sort which may arise as a result of the erroneous function of a space missile intended for the moon but which instead, through defective mechanism or planning, lands on the territory of another nation. If such a nation were at that time in an advanced state of tension in anticipation of a possible attack, this simple error might touch off the spark of world conflict.
>
> Which brings me to the competitive race to develop an intercontinental ballistic missile. We in the American Congress have already learned that it would be a drain on all our budgets if that race should set a pattern in the whole field of space conquest. Russia and this country are working at high speed toward the attainment of an intercontinental ballistic missile, called by many "the ultimate weapon." Yet if the missile were to be attained almost simultaneously and prove to be as accurate as now forecast, if indeed it could carry atomic warheads with a striking power of several kilotons and place them within the area of a small circle, then no city in the world is safe, no jet interceptor can police the skies and no highway can promise egress from the affected area. In that day the people of the earth would banish the weapon as poison gas was outlawed in World War II, but

only after the expenditure of fantastic sums of money, materials and scientific skills.

Might it not be better to examine the chance to use space conquest as another project for an international laboratory? If we will never use this weapon once we achieve it, might it not be set aside as one segment of worldwide competition that could be surrendered to the effort to halt the race for a full arsenal of atomic arms in every land?

From page 15:

It is to that problem that I have directed these words. If the great powers find themselves in an atomic stalemate today—and I think they do—it is a carryover of patterns of national security which modern science has rendered obsolete. The military techniques which might emerge from the new areas of technology that I have been discussing can make the stalemate no worse. Already it is at a level in which any major power can precipitate almost total destruction upon an adversary (and in return upon itself) if it should make so tragic an error in judgment. Yet there is the danger that if these new areas of technology are developed in secret, some nation which at some future time is led by reckless rulers, may feel that it has gained so great a lead in some field of science that it may dare to launch an attack for world conquest. While this error in judgment will almost certainly be answered by mutual annihilation approaching totality, every effort must be bent while still we have the chance to prevent such dreadful miscalculations from occurring. Scientists, it seems to me, might suggest to the statesmen that modern technology could make the greatest contribution to the security of great powers if statesmen would move as far as possible from the secret competitive development of technologies under which we have largely operated in recent years. The scientists might urge, indeed, that the race for atomic arms could best be halted by having new fields of science developed jointly by all nations.

It is that theme which I am happy to see stressed by so many leaders today.

Mr. President, the following statement was issued today by Hon. Carl T. Durham, chairman of the Joint Committee on Atomic Energy:

I believe that what my associates on the Joint Committee on Atomic Energy have been saying today on the need to conquer outer space is very important for the security and prestige of this country.

We on the joint committee have been concerned with bold projects for many years. The development of the H-bomb and the *Nautilus* are examples. So also are peacetime proposals such as an accelerated atomic power program.

We consider this challenge of the conquest of outer space so important that I am appointing a special subcommittee on outer space propulsion to consider means of accelerating this country's efforts in this field. Senator Clinton Anderson, who is vice chairman of the full committee and who has long been interested in nuclear-rocket propulsion, has kindly consented to serve as chairman of this subcommittee. I would hope that the members of the

committee in the House and in the Senate who have a special interest in this program will consent to serve on the subcommittee.

I expect that the subcommittee will be established and in operation following the executive hearings being held next week on this subject by the research and development and the military applications subcommittees.

Exhibit A

Statement on the formation of a space commission by a special committee of the federation of American scientists, Los Alamos (N. Mex.) chapter, David L. Hill, chapter chairman

Recent startling developments have pointed out for all the world to see that we have fallen dangerously behind the U. S. S. R. in the development and exploitation of science in the national interest. This hard fact is not surprising to anyone who has followed recent trends in the support and encouragement of Soviet science, including education, as opposed to our reluctance to place the proper emphasis on intellectual endeavors. Indeed the past few years have seen the emergence of an anti-intellectual climate and an atmosphere of smug self-satisfaction which places a premium on conformity and finds us woefully unprepared to meet the current challenge.

The root of the difficulties in which we find ourselves is in the system which places the military in such close control of scientific research and development.

After a long history of resisting and attempting to discard such developments as the steamboat, submarine, smokeless powder, radio, airplane, atomic submarine, atomic bomb, and so forth, the military, in the short space of ten-odd years has become scientifically inclined to the extent of investing large amounts of time and money in research. To be sure, in the absence of other support this was better than nothing; however, there is considerable doubt in the scientific community as to the ability of the military to conduct scientific research in such a manner as to produce optimal results for a given expenditure of time, talent, and money. The military has a long history of tradition for the sake of tradition, interservice rivalry and bickering, and a discouraging lack of imagination in scientific matters.

In view of all this, together with the success of the civilian Atomic Energy Commission, there seems to be little wisdom in permitting the military to continue to exercise direct control over such a large fraction of the talent and money devoted to research today. This is especially true in the case of research pertaining to space travel, satellites, and ultraterrestrial research in general. It is obvious that for maximum scientific productivity this research should be done in a climate unfettered by narrow traditions, not unduly restricted by precedent and free from the "orders" of a ranking officer.

We suggest one way in which these ends can be achieved. This is by the formation of a civilian Space Commission modeled

after the Atomic Energy Commission, which has long since proved the wisdom shown in its formation.

In forming this Space Commission a few mistakes made in setting up the AEC could be rectified.

The Commission should comprise 5 to 7 members, and at least 3 to 4 of these should be scientists, the chairmanship being held by a scientist well experienced in scientific administration. Also included should be 1 representative each from industry and the military. As in the AEC, this Commission would report to the President and be empowered to request and receive appropriations from Congress, It would have the authority to decide what avenues of research (applied or basic) would yield the most profitable results for a given expenditure of time, talent, and money.

The establishment and staffing of the laboratories devoted to ultraterrestrial research would be one of its prime responsibilities. The Commission is to have the authority and stature commensurate with its responsibilities. It should have all necessary authority to decide an issue on its scientific merits without regard to irrelevant political considerations of interservice rivalry.

It is believed that with such a Commission the talent that is now widely dispersed would gravitate into work sponsored by this Commission resulting in the assemblage of our most able scientists in a well-coordinated organization. Such an organization is essential if we mean to regain the ground lost under the present system.

While the establishment of a Space Commission will do much toward giving order to a very disordered system, it is felt that much more can be done toward giving science and technology its proper place in the national picture.

The most important single step would be the creation of a Department of Science and Technology with full Cabinet status. It seems clear that the contributions of science and technology to the commerce, health, and living standard of our Nation make such a move mandatory. We know of no other field of human endeavor that has given anywhere near that of science to the peoples of the United States and the world in general. There is no doubt that almost all of our commerce today was created by science or at least depends heavily on it. (An excellent case in point is the television industry which has been created by science and technology in the space of fifteen-odd years, and is over a $5 billion industry.) Yet, we do not have a Department of Science and Technology while the need for a Department of Commerce seems clear to everyone. We therefore, suggest that all steps necessary for the creation of a Department of Science and Technology be taken at once in order that science and technology may have its proper place in our society as soon as possible.

PROSPECTIVE ON SPACE RESEARCH IN OPERATION

America is faced with the elementary need for those tools which will insure our survival in the face of Russian advances in science and technology. The need is much broader than the word "missile" would imply although it has been strikingly demonstrated in these past few months for all the world to see by the Russian successes with earth satellites. We will consider the root causes

for the slow start and then recognize the splendid opportunity afforded America for world leadership in the challenging and exciting new area of outer space research, and the technological harvest the Nation will reap from a properly oriented and organized program. It is manifest that in a sensible approach to the organization of a space research and development program, we will take advantage of this opportunity to win men's hearts and minds and not be content with narrow military objectives alone.

A. International aspects of space travel

Missiles, experimental satellites, and space platforms are but the steppingstones toward space operations and space travel. The idea of space travel has fired the enthusiasm of men. We propose that the United States combine the best of nationalism and of internationalism in its approach. Let us be nationalistic to the extent that we move ahead vigorously with our own resources without permitting the redtape of international agreements to delay our research and development. On the other hand, let us be international by having our laboratories open to the scientists of many lands and perhaps of all lands. Let them be welcome to come and join with us in our effort. Initially, they may come as guests, but soon such a program might lead to joint support from the government of many nations. Thus we may succeed in diverting the military threat of competitive nationalistic conquest of space. By turning men's minds away from missiles as a new arm of war, and directing their attention instead on the conquest of the new frontier, great resources of enthusiasm and goodwill may be mobilized around the world and redound to the benefit of the United States.

It is implicit in this suggestion that the work will be unclassified because we believe such an approach will be relatively more advantageous to the United States. This view is supported by the current failures of the classified approach in the missile field.

B. The value of extraterrestrial travel

We are unable now to evaluate in any quantitive way the worth to mankind of traveling to the moon, to the nearby planets or into outer space. However, the restless and inquiring spirit of man has throughout the ages pressed on wherever there were frontiers. The rewards of this search for knowledge are manifest. They include the very clothes we wear and the books we read. Our civilization is the composite of these outpourings of the inquiring spirit. Let the attention and energy of men be diverted away from this troubled planet of armed camps in which we live, and diverted toward the conquest of outer space instead of toward the conquest of each other.

C. National planning for nonmilitary objectives

Recent events have highlighted that the principal national planning for scientific research and development is in connection with military objectives. As a consequence the cultural and economic objectives of the United States, as well as its concern with maintaining prestige in the community of nations, has suffered because we as a government refuse to create appropriate authority

for planning toward nonmilitary objectives. The present work of the National Science Foundation, as well as of certain other agencies, is of great value to our country. However, in order to be really effective this work must be amplified and must be placed at a higher level of operational authority in the Government. The creativity and productive power of private individuals, private institutions, and corporations may be aroused by such an authority to make their proper contribution to the national interest.

D. The fountainhead of military strength

In the present age of advanced technology, the defense of a country depends increasingly upon the wealth of scientific principles available for creation of military devices. By training and by delegated responsibility, however, the military people themselves cannot be expected properly to encourage and to support fundamental scientific research. Military decisions must always be taken in terms of present defense and military strength of the immediate future. Long-range commitments to scientific research having no foreseeable application will always tend to be abused and sideracked by a military directorate. Thus the necessarily restrictive military interest itself demands that an agency equivalent of authority, prestige and budgetary priority to the Department of Defense, itself, should be created to assure the optimum growth of our national science program. Its task should be to provide funds where needed, and to assure that the freedom of individual enterprise and incentive as required for creative work in science should always be present.

E. Organizational approach

The injury to our missile program arising from intraservice rivalries and disputes has been sufficiently well publicized that it need require no comment here. Although the present missiles program should probably move toward the achievement of the immediate objectives under approximately the present organization, it is clear that the next generation of missiles should be mothered by an authority operating separately from, and independent of, the Department of Defense and its fighting subdivisions.

The research and development for our missiles program is presently under a diffuse structure which we shall call industrial producers type of organization. We believe this type of organization to be faulty and we propose instead a project-center type of organization for research and development. The industrial producers type of overall organization has a number of defects, including the following:

1. Research in fundamental science is not germane to the short-term profit interests of an industrial corporation. Hence with rare exceptions industrial producers do not have an adequate assembly of scientists.

2. When the aircraft companies were given the responsibility for research and development on missiles, they attempted to remedy their scientific staff deficiencies by going into the personnel market with disruptive salary offers to buy the necessary person-

nel to provide adequate contract proposals and then to fulfill their contract commitments. These hiring practices of the aircraft companies served to uproot many hundreds of scientists from places in which they were effectively contributing to the national defense.

3. The newly employed scientists were, with rare exceptions, utilized ineffectively and in many cases are still not being utilized effectively in the aircraft companies. In many cases, singly or in small groups, scientists are assigned problems to work on which can be effectively treated only by a substantial number of men working together. Thus there are not enough men together to make an effective or critical group.

4. Communication barriers between the companies prevent scientists in different parts of the country, who are assigned to work on closely related problems, from learning of the activities of their fellows. The natural difficulties of communicating between geographically separated companies are worsened by the proprietary interests of different industrial producers, which prevent them from making available to other industrial producers the information which one company may have uncovered.

5. Coordination of work by subcontractors has been, in the main, faulty. Thus missiles are assembled of components each of which may be satisfactorily meeting its specifications, but the overall assembly suffers because systems analysis for the unit as a whole has been inadequate. Many early failures of our missiles can be traced to the absence of sufficient overall coordination between the different companies contributing component parts to the missile.

6. Because each small team of scientists knows that there are probably several other teams trying to do the same thing, the sense of urgency on a given team, as far as the national program is concerned, is diminished. When the frustrations from inadequate staffing and the difficulties of communication become too wearisome, it is easy for a team to relax somewhat, assuming that somebody else will accomplish the job they find too tiresome to do.

7. A research and development program which must be closely coordinated to receiving and holding a contract for a specific job is defective for at least two reasons:

(a) The rush in each company to try to get a slice of Government money available in a given area of missile development leads to chaotic research conditions, with poorly conceived plans patched together to try to submit a proposal as soon as required for bidding. Such a proposal is very likely inadequate and in addition the pressure for its conception and preparation drains away manpower which should be left free for long-range research.

(b) In the present organizational setup, the research programs are in general closely tied to production and are subject to the same vagaries in support as are the production items. Thus, the continuity is lacking for the continuing long-term research necessary to make breakthroughs into new principles and methods; moreover, the knowledge in the scientific world that such impermanence of research operations is characteristic of the industrial producer, inhibits the ability of the company to acquire the highest caliber of scientific personnel.

8. The proprietary interest of the various industrial producers now engaged in the missiles program are providing a chief bottleneck for progress in this field. The Ramor Wooldridge Corp., which has the responsibility of receiving information on activities throughout the missiles field, is unable to transmit to one company information which it receives from another because of the restriction of proprietary interests. Not only would it clearly be in the national interest to have free and complete exchange of information between companies, but would probably also be in the interests of the companies themselves in permitting each to achieve more efficient and rapid results. However, under the present system the old tradition of proprietary interests is tending to blind management to the necessity for a new mode of operation.

The characteristics listed above indicate why the industrial producer's approach has bungled our missiles effort.

In contrast, the project center type of organization was highly successful in the early years of the atomic energy project and also in the development and application of radar. Some of the advantages of the project center type of approach are the following:

1. Responsibility for achieving the proposed program is uniquely delegated to the project. Thus the highest sense of urgency is generated which leads to (a) the fullest dedication of the individual staff members to the task at hand, and (b) attracts into the project organization concerned scientists who wish to be sure they may go where they can make the maximum contribution to the Nation.

2. Scientists are brought together in one laboratory or at least into laboratories which are in close communication so that a sufficient number of people are available to form a "critical" or reactive unit for solving each particular problem.

3. A diversity of backgrounds, approaches and disciplines may be assembled in one large interacting project such that a minimum of delay is involved in working out new fields that require the merger of several disciplines and technologies.

4. The established objective is understanding of scientific principles and achievement of successful application. These objectives lead to better research results than the objectives mentioned above of rushing together some sort of contract application or, in general, trying to direct operations in such a manner as to be profitable from the short-range point of view.

5. Continuity of support for a research program is usually available so that the top-grade scientists are willing to make the investment of the years of time sometimes necessary to achieve significant advances.

6. The production of devices need not be done by the project organization itself. Once the specifications have been drawn as the result of the fullest liaison between scientists and engineers, then the work of production itself may be done in existing shops which are mostly under the roofs of the industrial producers. Industry, moreover, is accustomed to handling business this way and likes to receive a well-defined set of specifications and simply do the job as defined.

7. The organization operating the project should be neither a profit-seeking corporation nor directly an agency of the Government. The difficulties which the profit motive interposes in the conduct of long-range research and development have already been noted. The disadvantage of direct Government operation is the excessive amount of redtape which is then involved. Optimum operation apparently comes from a private nonprofit foundation or some other private agency which may operate the project on a cost basis for the Government.

8. When deserving programs of research have been conceived, there should be a minimum of difficulty in obtaining financial support for the research. A general defect at present in our country is that inadequate sums are available for the fundamental basic research that alone can generate the knowledge on which subsequent power over nature must rest. We have grown accustomed to spending large sums of money for engineering development but have not as a Nation yet come to understand that basic research itself is the source of all subsequent applications. Moreover, it must be emphasized that the criteria for the support of basic research should not be the existence of an immediate or apparent application of the results. Such criteria would inhibit the very creative process which is the objective of fundamental or basic research. It is to be observed that such an organization would avoid the fragmentation of effort characteristic of the present producer's approach.

F. Incentives

Clearly, if our system of free enterprise deserves to win out in the industrial competition with the Communist bloc of peoples, then it should be able to win the competition by the intelligent mobilization of the individual initiative, enterprise and resource of the free world. To some extent, the present mode of operation of the missiles program is a blundering effort to do just this. However, it seems apparent that we cannot longer afford to operate in a manner handicapped by the present difficulty of industrial producers in carrying on adequate scientific research programs. For the industrial production itself, we may continue to rely with confidence on our large industrial producers.

A review suggests that we, as a capitalistic country, have been exceedingly slow to apply capitalistic incentive to promote fundamental scientific research. Here we notice an amusing contrast with Communist Russia where tax-free prizes of large amounts have long been given to provide capitalistic incentive to the work of Soviet scientists. It is suggested that in the field of space research and operations, as well as in other important scientific areas, salary scales should reflect the importance of science to our society. In addition a number of large prizes might be established for scientists and engineers. Such prizes might be offered for (1) ideas that come into use in national laboratories, world laboratories or elsewhere, even though such use is for research purposes only, and therefore not commercially rewarding. The size of the prizes might be determined by (a) the singularity of the idea involved, (b) the priority of the idea; (2) a second

basis for prize awards would simply be the best papers in a given field each year.

From a long-range point of view, much has been appropriately said about the anti-intellectualism in America which discourages many talented youngsters from going into scientific careers, and much has also been well said about the inadequate level of science training available in our grade schools and high schools. We recognize these problems but do not dwell upon them here. Our objective in these comments has been to set a framework in terms of general comments, supplemented by specific suggestions, which we hope will permit an early, positive showing of results in recovering for America its position of leadership in this area of science and technology.

Although we have in this discussion for timely reasons concentrated upon space research and operations and termed this area of technology as the new frontier, it should be remarked that the nature of scientific progress has been such that new frontiers are ever opening to mankind and will probably continue to do so. Thus, the need for and justification of a Department of Science is even broader and stronger than its value in supporting science as it may apply in time toward our position in space research and operations. It is only that this field provides at the present time a most dramatic evidence of our need for a properly coordinated support of scientific research in this country.

We believe that much of the remedy for the dismaying state of our present missiles and space research program must come through legislation of imaginative and courageous conception. We believe that the fundamental defect in the present situation stems from our failure as a Nation to comprehend the challenge of the new area of technology now opening for the conquest of outer space. It is imperative that America be set on the right track in moving into this great new endeavor. The above comments represent an effort to outline the character of legislation which would (1) mobilize the great energies and talent of the free world toward outer space research, (2) have the early effect of strengthening our military posture, and (3) cast our effort in such a form that it may tend to draw together the peoples of the world, and permit in the foreseeable future the full conversion of military postures into attitudes of cooperation of all peoples in the conquest of outer space.

Exhibit B

Senate Resolution 295 (84th Congress, second session).

Whereas the principles which underlie scientific progress are universal in their application:

Whereas history reveals that all nations benefit from the cross-fertilization of ideas among the scientists of all nations:

Whereas the great progress of the United States in atomic energy and many other scientific fields has been furthered by the work of scientists of other nations:

Whereas the excessive isolation of basic scientific research behind rigid national walls breeds suspicion and may tend to divert a disproportionate part of the scientific effort to destructive rather than constructive effort;

Whereas greater communication and contact and common effort among the leading scientists of the world will produce more intensive progress in such fields as medicine, nuclear energy, weather control, and the solution of the mysteries of outer space, which will be of lasting benefit to all mankind; and

Whereas the present year, being the International Geophysical Year in which all nations are cooperating in meteorological research, provides a fitting occasion for the advancement of international scientific cooperation: Now, therefore, be it

Resolved, That it is the sense of the Senate that the President of the United States explore with other nations, through such channels as he finds appropriate—

(1) the means of conferring on an outstanding scientist in each of the major scientific fields, selected annually on the basis of contribution to the good of mankind, regardless of nationality, an honorary world passport;

(2) the means of creating a world laboratory to serve as a center of advanced scientific research and to supplement and facilitate national efforts in this connection; and

(3) the means of giving additional encouragement to the travel and exchange of scientists throughout the world and the exchange of scientific information.

SEC. 2. On the basis of such exploration, the President shall make suitable recommendations to the Congress.

DEPARTMENT OF STATE,
Washington, July 12, 1956.

DEAR SENATOR GEORGE: Reference is made to your letter dated June 26, 1956, addressed to the Secretary, requesting the Department's comments on Senate Resolution 295 introduced by Senator Anderson June 25, 1956, favoring steps for the advancement of international scientific research.

The Department is in sympathy with the broad objectives in the resolution of encouraging international exchange of scientists and scientific information. Its general comment on the measure is that the extension of the traditional national and international procedures does not appear necessary for achieving these ends. Its particular comment is that endeavors toward the issuance of honorary world passports and the establishment of a world laboratory are likely to encounter stubborn articles.

As you know, the Department has for some time administered exchange of persons programs in which opportunities have been provided for American scientists to study, teach, and lecture abroad, and for foreign scientists to carry on similar activities in this country. It has encouraged private exchange programs, international scientific assemblies, and private travel by extending its advice and lending its facilities. Also, the Department has stimulated the interchange of scientific information through

formal exchange agreements with foreign countries and through informal arrangements. It has also assisted private programs for scientific information exchange. Other departments and agencies of the Government carry on similar programs. Beyond these activities, the United States had contributed to the United Nations for the purpose of carrying out programs for the international exchange of scientists and scientific information. Thus, procedures and mechanisms already exist for the encouragement of scientific progress. It is the Department's view that these might well continue to be utilized to achieve the broad aims envisaged in the resolution.

Issuance of honorary world passports raises such practical questions as the constituted issuing authority, the likelihood of appropriate changes in national laws, and the matter of selecting outstanding scientists for such honor. This section of the resolution, moreover, may be regarded as discriminatory. In any event, an honorary passport would not in itself guarantee free mobility since many nations require a visa for entry.

As to the establishment of a world laboratory, experience indicates that greater promise lies in national efforts developed on a cooperative, or better still on a coordinated basis. Further, it is believed that the demand for such a laboratory originating from scientists themselves would insure greater success than would the initiation of such an establishment through Government auspices.

Sincerely yours,

ROBERT C. HILL
(For the Secretary of State).

[Congressional Record, January 23, 1958]

EXPLORING THE NEW AREAS OF STATESMANSHIP

Mr. FLANDERS. Mr. President, in the speech which Secretary Dulles delivered at the Press Club last week, I find new grounds for hope that an area of constructive statesmanship is at last opening before us. It is true that the body of the address repeated our besetting faults. A section of the problem of armament control was offered the Soviet Government as a challenge to its sincerity. This, of course, is not the way in which successful negotiations are begun in private life between two parties each of whom holds a strong position. Neither is it the way in which we can carry on international negotiations with any hope of success, where the other party holds so strong a position as does the Soviet Government.

Whether in private or in governmental negotiations, the constructive course is to find the area of mutual self-interest. With the Soviet Government there is no other effective method to use, if we are sincere in our search for armament control. Mutual self-confidence is out. There is none, except as it grows in the fertile soil of successful negotiations based upon mutual self-interest. It is useless to demand a show of sincerity by the Russians before beginning discussions. Should we not rather cease to impose on others impossible requirements of confidence and sincerity and demonstrate our own sincerity by proceeding from the practical base of mutual self-interest.

In his Press Club speech Secretary Dulles made the suggestion that an international commission be established to supervise all outer-space exploration and make certain that it be devoted to the interest of science and humanity rather than to military purposes. In so doing he repeated his urgent suggestions of last July.

This is not the only forward look by the administration, for the President's letter to Bulganin proposed joint negotiations to the same end. Furthermore, we may confidently hope that the President's open-skies proposal made at the Geneva Summit Conference is still open.

In the Congress, as well as in the administration, the same wise foresight has appeared. Notably, the Senator from Texas [Mr. JOHNSON] saw in mankind's new celestial frontier the opportunity of adding a new dimension to freedom—and with it the very real prospect of reaching our goal of total peace.

Here, then, we have a positive indication of the prophetic vision of our political leadership. Can the vision be made real? I believe, Mr. President, that there are reasons for believing that we can make the vision real.

In the first place, we start with a clean slate so far as space is concerned. It is true that sputnik gave to the Soviets the psychological advantage of surprise, but we may be sure that their scientists and engineers have no doubt of our ability to equal and exceed that achievement in a very short time.

It may be argued that the opportunity for international agreement on atomic-energy control was even greater, since we held a near monopoly on that development when it was still new. Yet the Soviet Government, itself engaged in atomic development, turned down our proposals. This, in my judgment, does not make sure that new proposals for space control will meet with the same fate. There is a healthy regard in Russia for the certainty of annihilation in case of an atomic war, and space-navigating proficiency multiplies the danger a thousandfold.

Furthermore, it is highly probably that the Russians have a better concept of our progress and capabilities in this field than do the American people. Our Euro-Asian friends cannot be sure of being the first to occupy space in some practically effective way. Therefore, agreement on the basis of mutual self-interest is by no means impossible. Let us give it a try.

Where shall we begin? Shall we start at the moon and work down, or shall we start at the earth and work up, even though our destination is the moon and points beyond?

Mr. President, it is my suggestion that we revive the President's open-skies proposal as the first step. Here is mutual advantage—plus. No one who has visited the missile centers of this Nation can escape the conviction that we are near to the launching of a satellite, manned by a willing and intelligent observer and reporter, who will be returned safely to earth. Even before that time we may have General Shriever's satellite carrying a recoverable capsule with its observations and reports intact. Let us proceed with all diligence to develop these and other means of occupying space effectively, depositing the records with the United Nations, and thus being the first to practice open skies for peaceful purposes.

It may be that our bargaining position is even better than this. It should not surprise us to learn some fine day that we are already taking pictures from the air, by means unrevealed to us common folk. It may be that our Soviet friends know this but cannot stop it. It is just as possible that the Soviet Government is now doing the same thing. I have no information on these matters, but such confidence have I in scientific achievement and practical skill that such a development would not at all astonish me.

Mr. President, let us not bungle this opportunity. Let us not approach it in any spirit of moral superiority, but on the basis of self-interest. Let us follow where the President pointed and led the way. Let us see what can be done with open skies.

From there we can go upward to space exploration and control, and outward to the control of land, sea, and air armaments—all without adding to the tensions of our atomic age. Let us make it a new Elizabethan age of exploration instead, but without any attempt at exclusive occupation. For space cannot be exclusively occupied.

Let us get going.

STATEMENT BY PREPAREDNESS INVESTIGATING SUBCOMMITTEE OF THE COMMITTEE ON ARMED SERVICES, JANUARY 23, 1958.

Mr. JOHNSON of Texas. Mr. President, I have a very brief statement which I should like to present to the Senate, if my colleagues will indulge me.

The Senate Preparedness Subcommittee today concluded its current series of hearings into the satellite and missile programs with the adoption of a unanimous statement, in the nature of an interim report.

That statement expressed the sense of unity that the committee has as to the urgent need for strengthening our country's defenses. It expressed the kind of unity which I believe Americans desire.

We tried to state the facts which give cause for foreboding and the facts which give cause for hope. We stated those facts not as members of political parties but as servants of the Senate reporting to the Senate and to the people of the Nation.

Our country is entering a new period of history in which the total resources of America must be brought to their greatest development. No segment of our economy or of our life must be ignored or neglected.

Our programs, our policies and our practices must all be in good working order. A full national effort is required and this can be achieved only by people working together.

The goal is not merely to imitate some Soviet missile or some Soviet achievement. This attitude could lead us into a hypnotic trance in which we would forget that our true strength is our freedom.

That is a fundamental which we must not forget.

We would lose much more than we would gain if we tried to match totalitarian accomplishments by adopting totalitarian methods and values.

Our need to mobilize today flows from a necessity of forging ahead to broader frontiers of freedom—not merely from the need of catching up with the Soviets.

We must not fail because we sell short the potential of a free society. We must succeed by unleashing our minds, unleashing our capacity, and moving forward with the great force, vigor, and imagination of which we are capable.

I believe that spirit dominated the deliberations of the Senate Preparedness Subcommittee.

I do not mean that we are in agreement on every point presented to us in some seven-thousand-odd pages of testimony. The members of the subcommittee will differ on many specific points. But we see the dangers before us through the single perspective of Americans determined that freedom shall survive.

I wish to express my deep appreciation to the majority and minority members of the subcommittee. Without their wholehearted cooperation, the enterprise in which we have engaged would not have been possible.

I wish to express my great admiration and respect for our counsel, Mr. Edwin L. Weisl, who gave freely of his great talents and energies to bring about this report; to his associate, Mr. Cyrus R. Vance, and to the many other staff members who contributed to the report.

For the benefit of the Senate, I wish to read the committee's statement, which is brief. Let me say, as I think I stated earlier, that there were 10 members present, all of whom approved this statement.

Approval of the following statement was voted by the members of the Senate Preparedness Committee: Senators Johnson (chairman), Kefauver, Stennis, Symington, and Senators Bridges, Saltonstall, and Flanders. In addition, the other members of the Senate Armed Services Committee who were present at the meeting—Senator Smith of Maine, Case, and Bush—indicated their approval of the statement.

We have now concluded our current set of hearings. On behalf of the subcommittee in consultation with other Members, I am making a brief statement.

No responsible civilian or military leader in the Government can do aught but face with deep foreboding the current prognoses of the outcome of general thermonuclear war. The subcommittee feels that the problems involved in this hearing are of immediate urgency to our Government and our people.

For the past 110 days, this subcommittee has been engaged in an unusual enterprise. It is a review of the Nation's present and future defense posture in the right of a rapidly evolving science and technology.

The subcommittee has heard some 70 witnesses. About 200 experts have been interviewed. Questionnaires have been sent to leaders of science, education, industry, and government. Some 7,000 pages of testimony are before us.

This inquiry has been one of the most thorough in my memory. It had to be because the subject matter did not permit anything except a careful, prudent, thorough approach. I believe both majority and minority Members will agree with that point.

In the course of our investigation, I hope we have been able to present to our people important facts. I know that it has been an educational process for me, and, I believe, for the other members of our group.

We began with a simple—but revolutionary—fact. It was that for the first time in all history, a man-made satellite was placed into an orbit around the earth.

There were many who realized that this was an inevitable development of the march of science. But the circumstances under which it happened were startling and brought into sharp focus facts which had been known previously but not fully appreciated.

We had expected to be first with this achievement. In fact, we have yet to prove second—although our own achievement in this field is not very far away. The winner was the Soviet Union.

From the beginning, however, it developed that there was much more at stake than the prestige of being first.

There is no evidence that the satellite is a weapon now.

But it has two important implications.

First, it demonstrates beyond question that the Soviet Union has the propulsive force to hurl a missile from one continent to another.

Second, the Soviet Union has gathered basic information about outer space.

These two facts raised a number of disturbing questions. We set out to explore those questions and determine the answers. On the basis of sworn testimony by top scientists, leading industrialists, and Government and military officials, it can now be said:

First. The Soviet Union leads the United States in the development of ballistic missiles.

Second. The Soviet Union leads the United States in number of submarines, which raises the possibility of attack with modern weapons or missiles—although the indications are that we are ahead in the production of atomic submarines.

Third. The Soviet Union is rapidly closing the gap in manned air power—and, at present rates, will surpass this country in a comparatively short time.

Fourth. The Soviet Union has a system which enables it to develop new weapons in substantially less time than the United States.

Fifth. The Soviet Union has led the world into outer space.

Sixth. The Soviet Union is producing scientists and technicians at a rate substantially greater than is our country.

These facts do not give cause for comfort. But we do not consider them a cause for despair or hopelessness. We regard them as a challenge to all Americans.

There is nothing in the record to indicate that America has lost its vitality or its capacity to produce in time whatever we need to retain our present power to strike devastating blows—blows of almost total destruction—at any aggressor.

The facts which we have been investigating are the facts of the future. And while the future is very close—extremely close—it is still under our control.

There is no point in arguing that things might have been different had things been done differently in the past. Everybody on this committee is willing to concede that point.

The past is already for historians. Let us seek solutions so that the future may be written by free world historians.

Since sputnik I was put into orbit, and this inquiry began, the Secretary of Defense has taken the following actions:

Overtime restrictions have been removed from the ballistics programs and some of the other high priority programs.

Basic research projects have been restored to former levels.

The Army has been ordered into the satellite program.

Production of the Thor and Jupiter missiles has been authorized.

The development of the Atlas missile has been stepped up.

Development of the Polaris missile system has been accelerated.

The Army has received a go-ahead for developing a new, solid fuel missile.

An advanced research project agency has been authorized.

An office of Director of Guided Missiles is now in being.

Development of antisubmarine warfare capability has been stepped up.

Steps to disperse the Strategic Air Command are underway.

The Air Force has been authorized to go ahead with an early warning program against missiles.

The Army has been assigned the task of developing an antimissle system.

The Secretary of Defense has appointed consultants and has promised to come to Congress as soon as possible with recommendations to improve Defense Establishment through organizational changes.

I may say, for the information of the Senate, that the Secretary of Defense told us yesterday that he was hopeful he would be in a position to make positive recommendations within the next few weeks, perhaps by late March or early April.

These steps are admittedly only a beginning. There are many steps still to be considered. And it is heartening that the Secretary of Defense is keeping an open mind on those steps and has pledged decisions and greater actions, when such actions are necessary, as soon as possible.

The committee has received many urgent recommendations. The principal areas covered, though not necessarily in the following order of priority, upon which decisive action must be taken are:

First. Modernize and strengthen the Strategic Air Force.

Second. Step up the dispersal of SAC bases.

Third. Put more effort into developing antimissile missiles.

Fourth. Improve our early warning system for manned aircraft and accelerate the development of an early warning detection system for ballistic missiles.

Fifth. Modernize and strengthen ground and naval forces.

Sixth. Provide an adequate airlift for ground troops.

Seventh. Pour more effort into our antisubmarine program.

Eighth. Step up production schedules of Atlas, Thor, Jupiter, and accelerate the development of Titan.

Ninth. Reduce lead time in the development of weapon systems by cutting down on decision time and by simplifying procurement procedures.

Tenth. Provide for a freer exchange of scientific and technical information between the nations of the free world.

Eleventh. Start work at once on the development of a rocket motor with a million-pound thrust.

Twelfth. Give serious attention to the question of shelters and stockpiles for civil defense.

Thirteenth. Reorganize the structure of the Defense Establishment.

Fourteenth. Provide increased incentives for the retention of trained personnel in the military service.

Fifteenth. Accelerate and expand research and development programs, provide funding on a long-term basis, and improve control and administration within the Department of Defense or through the establishment of an independent agency.

Sixteenth. Put more effort in the development of manned missiles.

Seventeenth. Accelerate the development of the Polaris missile system.

The recommendations will all receive the careful consideration of the committee. They will be evaluated in the light of facts—carefully, thoroughly, and prudently.

There is another point I should like to make. The responsibilities of this subcommittee are limited to defense. But we have reached a stage of history where defense involves the total effort of a Nation.

We have been led into fields which will have to be explored by others with proper jurisdiction and with greater background. But these fields are related to our principal responsibility—the defense of our country.

There is, of course, the highly important field of education, which the able junior Senator from Arkansas [Mr. Fulbright] has referred to eloquently and at length this afternoon. It is obvious that all our plans for the future will be frustrated if we do not foster the training of our children along broad lines through greater concentration on science and mathematics without neglecting the humanities.

We can produce the weapons of survival with what we have now. But the missiles which are so dreaded today may prove obsolete almost as soon as they become realities.

There can be no adequate defense for the United States except in a reservoir of trained and educated minds.

Even more important, however, is the fact that there can be no security for the United States or any other country in weapons. The most accurate and destructive missile yet conceived can bring us nothing but a stalemate.

We prefer a stalemate to defeat and slavery. Let there be no mistake about that.

I am happy that the distinguished junior Senator from Minnesota [Mr. Humphrey] is on the floor, because I want him to follow the last lines of this intermediate report.

But the same forces, the same knowledge and the same technology which are producing ballistic missiles can also produce instruments of peace and universal cooperation.

We are engaged in a race for survival and we intend to win that race. But the truly worthwhile goal is a world of peace—the only world in which there will also be security.

The immediate objective is to defend ourselves. But the equally important objective is to reach the hearts and minds of men everywhere so the day will come when the ballistic missile will be merely a dusty relic in the museums of mankind and men everywhere will work together in understanding.

Mr. HUMPHREY. Mr. President, will the Senator yield?

Mr. JOHNSON of Texas. I am happy to yield to my friend from Minnesota.

Mr. HUMPHREY. I am happy indeed that I was in the chamber this afternoon when the majority leader made his intermediate report. I know it would have been a temptation for anyone in the Senator's position to have delivered a very pointed and even a caustic report, which would have been interpreted by some as partisan.

It would have been possible for the majority leader and the majority members of the committee to have assessed political blame.

I believe the majority leader, in his report, has relied upon the intelligence of the American people as to where any blame or fault may lie, and as to whether the recommendations which have been placed before us are sound and adequate.

I wish to commend the Senator from Texas and his committee. The intermediate report should be classified as "must" reading for every citizen of this Republic. It will also be reassuring, I am certain, to our allies, because it demonstrates the active, alert, keen, and dedicated interest of one of the coordinate branches of the Government, namely, the Congress, along with the executive branch of the Government.

I add these few words: Just as the subcommittee on preparedness is in the process of reviewing our basic military needs and our defense needs, so the entire area of American foreign policy will come under review, and needs to, in the same spirit, I may say, of constructive proposals and careful evaluation. When we find weaknesses and mistakes, we must correct them, instead of abusing one another. Where we see need for progress and new proposals, we must have the boldness to undertake them and carry them out.

Mr. JOHNSON of Texas. Mr. President, if the Senator will permit me to do so at that point, I should like to congratulate the committee of which he is a member for such worthy objectives and such high motives and such desirable proposals as he has enunciated, in an effort to seek the truth and in order that the United States may be worthy of the leadership of the free world, in which we take so much pride.

Mr. HUMPHREY. I am of the opinion, I may say to the Senator from Texas, as I conclude my remarks, that the American people are so deeply concerned about the future of their country and about their present condition, that they will look with a certain amount of disdain and justifiable disgust upon Congress if our efforts to study the defense and foreign policy posture of our Nation, and if our efforts to strengthen both our military and foreign policy program, are treated in too rabid and partisan a manner.

Needless to say, there will have to be discussions, and in some areas disagreement. I believe we must be able to disagree in such a manner as will enable constructive alternatives to be offered.

I have spoken on occasion, very bluntly, concerning the foreign policy of our country. I shall do so in the future. I shall not chastise those who are in charge of it, but rather I shall offer what I hope will be fruitful and constructive suggestions to those who will continue to have responsibility.

I hope the Senator from Texas, the majority leader, will permit me to associate myself with the worthy objectives which have been expressed here today in the interim report. I am not a member of his subcommittee. I can say that the concluding paragraphs of that report are, of course, the spirit of the Nation and the hope of mankind.

It is my intention, as the chairman of the Subcommittee on Disarmament, to present to the Senate next week a statement of what I believe has been going on in this very difficult, complex, uncertain, and as yet, fruitless field, and to offer some constructive suggestions in that particular area.

I would only say that the hope of disarmament, or the hope which the Senator from Texas outlines, is possible only if this Nation can survive, because it is a truth that the leadership of free men rests in the Government of the United States and in this Chamber.

If this Government and this Nation are in peril, and if by any unhappy set of circumstances we should be weakened or destroyed, then I honestly believe that the hope for a world in which freedom can live will have been lost.

Mr. JOHNSON of Texas. Mr. President, I am indeed appreciative of the contribution which my able friend from Minnesota has made to the discussion, I am delighted that he should feel justified in associating himself with the statement made by the entire membership of our subcommittee.

I should not want this opportunity to pass without the Senator from Minnesota being informed that in the days ahead, when he travels down the rugged, rough road looking for peace, he will have my prayers and my support because, Mr. President, if the only thing we have to look forward to is the spending of $40 billion or $50 billion a year to negate the expenditures of another great power we will, at best, be letting it all go down the drain.

Somehow, somewhere, the great minds which have done so much to bring us modern implements, great adventures in science, and great discoveries, must be able to find a solution whereby men can live in the world together. If not, the road ahead will not be a very happy one.

Mr. YARBOROUGH. Mr. President, I desire to add my words of appreciation to those of the distinguished Senator from Minnesota concerning this message of great importance from the Subcommittee on Preparedness. I express my admiration for the wonderful work which has been done by the subcommittee, particularly by its chairman, the distinguished senior Senator from Texas, of whom we are so proud.

I particularly commend him, not merely for the report upon the present state of our defense and about what has not been done, but, more than that, for the inclusion in the report of a set of present objectives, without awaiting the final report, to give America some goal toward which to work in preparations for the long pull.

Mr. JOHNSON of Texas. I thank my friend for his complimentary statement. He is always generous and kind to me. He knows I reciprocate his admiration.

Mr. MANSFIELD. Mr. President, I wish to join with my colleagues in congratulating the distinguished majority leader upon the responsible attitude he has shown, not only in conducting the hearings of the Senate Subcommittee on Preparedness, but also in being able to cause members holding diverse views to issue a unanimous report. This is another indication of the sense of responsibility which the distinguished Senator from Texas has shown, not only since he has been the leader of the majority party in the Senate, but also in the days when he first became a Member of the Senate.

It is a pleasure, in view of what has happened in recent days, to see that this sense of responsibility is still paramount. I am hopeful that the nonpartisanship—or, as one of our colleagues on the other side of the aisle referred to it a short while ago, the unpartisanship—on the part of the Senate Subcommittee on Preparedness will be the norm rather than the exception in the days ahead as the subcommittee undertakes to continue its hearings. The country can be confident that a good job has been done and that the unanimous recommendations of the subcommittee will have good and lasting results.

Mr. JOHNSON of Texas. I thank my friend from Montana.

OUTER SPACE DEVELOPMENT THROUGH PEACEFUL APPLICATION OF ATOMIC ENERGY

Mr. ANDERSON. Mr. President, I have introduced today a bill—S. 3117—to amend the Atomic Energy Act of 1954, as amended, to provide for outer space development through the peaceful application of atomic energy, and for other purposes. (See the section of this report on bills and resolutions.) The bill I have introduced is not to be regarded as the final form of a bill which the Congress should consider in this field. It has been introduced after consultation with the leadership, but that does not imply that the leadership, the Senator from New Mexico, or any other Member of the Congress is committed to the exact language of any portion of the bill. If hearings are to be held either by the Joint Committee on Atomic Energy or any other committee, there must be some bill on which to hold hearings. The bill has been introduced today for the purpose of developing the desired text. It is in compliance, I believe, with the prior announcements of the President, the statements of the Secretary of State, and the very fine address by the able majority leader [Mr. JOHNSON of Texas].

A very interesting article was published in the Christian Science Monitor of January 18, 1958. The article, which is entitled "The Assault on Outer Space," was written by William H. Stringer, chief of the Washington bureau of the Christian Science Monitor. Two paragraphs of that article, I think, are particularly interesting now. I read them:

> Meanwhile, Senator Lyndon Johnson, Democrat, of Texas, in a move typical of his wide-ranging senatorial leadership, has taken a slightly different tack, and urged the administration to invite all members of the United Nations to join in the active conquest of space as an outpost of peace.
>
> While Secretary Dulles has emphasized primarily supervision of outer-space usage, so as to maintain its peaceful character, Senator JOHNSON has urged that the conquest of space be made an actual joint venture of mankind, with joint research and development. This is probably a possibility implicit in the Dulles proposal, but the Texas Senator has stated it affirmatively.

I like this article by Mr. Stringer. He has caught the real essence, I think, of the proposal made by the majority leader, that this problem be stated affirmatively to the American people.

Mr. ANDERSON. Yesterday in article entitled "The Challenge of Outer Space," written by Dorothy Thompson, was published in the Washington Evening Star. She says, among other things:

> Senator LYNDON JOHNSON's proposal seems to me far more imaginative, because it is affirmative. He has urged the administration to invite all members of the United Nations to come together in a joint enterprise for the active conquest of space as an outpost of peace.

I like the continued emphasis upon an affirmative approach. Yesterday hearings continued before the Joint Committee on Atomic Energy for perhaps six hours. We heard witness after witness outline the possibilities of interplanetary travel—trips to the moon, and trips to various planets, all involving enormous development, and all involving the peaceful conquest of outer space and the possibility of using it as an adjunct for peace * * *

I wish to refer to another bill. I regret the junior Senator from Minnesota [Mr. Humphrey] is not present in the Chamber. However, I feel certain that he would not object to the remarks which I am about to make.

In a story which appeared recently in the press with respect to proposed legislation which was about to be introduced by the able Senator from Arkansas [Mr. McClellan] and by the junior Senator from Minnesota [Mr. Humphrey], there was a statement to the effect that they intended to introduce a bill calling for a widespread reshuffle of the Government's civilian scientific agencies, and that they proposed to establish a Department of Science with a Secretary of Cabinet rank.

The news story stated:

> Further, it would junk the Joint Congressional Committee on Atomic Energy in favor of new House and Senate standing committees on science and technology.

I have known the able Senator from Minnesota for a long time. He and I have discussed reactors, particularly the reactors to be built by the rural cooperatives in his State of Minnesota. I know that he felt that the Joint Committee on Atomic Energy had tried hard to be of great benefit to the people of his State. Therefore, I consulted him and asked him if his bill did, in fact, propose to junk the Joint Committee on Atomic Energy.

I was happy to have him assure me that the bill meant exactly what it said, and that while the committee would be carried forward under a new name, the provision in the bill was that the members of the existing committee would be members of the new committee. He stated that he was merely proposing to continue the Joint Committee on a different basis.

I stress this point because I am happy to say that I think these proposals to move forward in the conquest of outer space should appeal to all Members of Congress, and that they should approach the problem with a recognition of the things which have been done and the things which should be done if we are to utilize outer space to the greatest possible advantage. * * *

One of the things which I think we need to do is to inform ourselves on what the Russians are saying about outer space. Perhaps

we have not always done all we could to keep up with translations of statements by Russian scientists.

A Russian named A. A. Blagonravov, a member of the Academy of Sciences and a lieutenant general of artillery, who was in Washington at the time of the launching of sputnik, has written an article which was published in Soviet Aviation for December 29, 1957. This article is I think, typical of most Russian articles. It is very flattering to Russian scientists—perhaps not unduly so in some respects, but pretty lavish in certain others.

Among other things the article has this to say:

> Soviet science is making new conquests one after another. The first-in-the-world atomic powerplant was followed by the largest synchrophasotron—

Probably the statement of the Russian scientist is correct. He continues:

> "Tu-104" plane was followed by new passenger airliners: "AN-10," "11-18," and "Tu-114"; intercontinental ballistic missile was followed by artificial earth satellites which opened a new era in the history of mankind—the era of conquest of interplanetary space.

These are the Russian programs. The Russians are interested in the conquest of interplanetary space, and if we do not wish to have another upset such as we had when the sputniks first went into the air, when people were a little disturbed and alarmed, we must get our particular activity going in the field.

The Russian scientist then asks:

> What can be said in regard to the future of Soviet science?

While I do not intend continually to give publicity to all the fine things he says about Russian scientists, I invite attention to the following paragraph:

> Finally, the future of Soviet science is closely connected with the conquest of Cosmos. Soon will appear new artificial earth satellites, and then the first rockets (unmanned at the beginning) will blast away to the moon and other planets. As predicted by Tsiolkovskiy, Soviet man will become a "citizen of the universe." New, even more enticing scientific problems are looming ahead.

The conquest of the moon is a most interesting project for us, and certainly for the Russians. The other day I noticed a statement as to how easy it would be to put a rocket on the moon. I had made the statement that it would not be easy to put a manned space vehicle on the moon and have it return. I hope we shall not become confused by statements concerning two separate undertakings.

I believe it may eventually be possible to reach the moon with a chemically fired rocket, but I do not believe it will be possible—at least with our present knowledge—to reach the moon with a manned space vehicle and return it to earth using anything other than nuclear power. That is why I am extremely concerned that nuclear power be utilized in a peaceful manner for these purposes.

I do not intend to place in the Record all the statements made by Secretary of State Dulles when he addressed the National Press Club on Thursday, January 16. I only say that many of the things which

he stressed can be most easily developed in the fashion I have suggested in the bill which I have introduced today.

He compared the launching of space rockets with development of the atomic bomb. He stressed that we are in an era of great new developments. He said that in this era, great new developments could perhaps go uncontrolled for 10 years, but that, as in the case of atom bombs, there must come a time when they will have to be brought under control. I quote the Secretary of State:

> There would, I suppose, need to be some kind of an international commission, presumably and preferably under the auspices of the United Nations which would have the task, perhaps comparable to the task of the International Atomic Energy Agency, which has a task of assuring that the nuclear material that it disposes of, at least, shall be used only for peaceful purposes.

I have tried to put most of the text of the press conference of the Secretary of State in the Record, because he does deal with the extreme importance of seeing to it that we move forward.

I have tried to consider this subject and to weigh it and decide in my own mind whether the military should continue to have the greatest control in the development of missiles for outer space, whether the Atomic Energy Commission might preferably take it over, or whether it should be under the control of a wholly independent and separate agency.

As I said in the beginning, it may be decided by some Members of the Senate that the matter should be left in the hands of the military, while other Members of the Senate will feel that it should be left with a wholly independent agency.

For the present I have come to the conclusion that the first suggestion, at least, should be that we proceed with our existing laboratories and the personnel of the Atomic Energy Commission, with its existing facilities for contracting, so that this work may go forward rapidly. In that fashion I believe we can save perhaps several years, and I think it is very important that we save as much time as we can.

Therefore, Mr. President, although the bill was introduced after consultation with the leadership, it does not bind anyone to any particular course.

In the hearings by the Joint Committee on Atomic Energy within the past few days, much has been said about weather control. Prior to his untimely death, Mr. John von Neumann, a member of the Atomic Energy Commission, and probably the world's greatest mathematician at the time of his death, referred many times to an article he had written which had been published in Fortune magazine, predicting the possibility of weather control.

The development of an earth satellite, particularly the development of a satellite large enough to carry a television camera into outer space to scan the surface of the earth, would make it possible, in terms of weather prediction, for a whole section of the earth to know in advance whether there would be floods or a drought.

Therefore, in satellites orbitting around the earth, we have a possible step toward weather control, about which people have joked for many years, and which now may be brought about.

The presence of Soviet satellites in orbit suggests the early advent of space vehicles—manned or unmanned craft capable of propulsion

over large distances in outer space. The inevitability of such vehicles is becoming quite evident and we must assume that such achievement occurred to the Soviets some time ago. The presence of an animal in one satellite gives rise to such assumption. From the standpoint of military advantage and national prestige it seems imperative that we start a research and development program to attain space vehicle capability by at least the middle 1960's. This is an arbitrary date and national interests could well dictate speedier completion if Soviet intentions were known.

It is hardly arguable that we have the scientific and technical capacity for such a task and still meet other programing. The central point seems to be the policy direction of a program and under what jurisdiction it could be accomplished.

The President, as principal foreign-policy spokesman for the Nation has set the policy direction in his letter to Premier Bulganin of January 13. He proposed that outer space be used only for peaceful purposes and denied to the purposes of war. It follows then that it would be contradictory of purpose to have the space vehicle developed by a military agency because the most sincere intentions could be clouded by the genesis of the research.

Our able majority leader, the senior Senator from Texas [Mr. Johnson], has also called for United States control of space and its ultimate dedication to peace through a United Nations agency.

The concept of civilian control of energy and forces, military in origin but of great national and international importance, was debated and secured with the passage of the first Atomic Energy Act. This national decision in 1946 has been of great value to the Nation not only in accomplishment, such as the huge weapons stockpile, the hydrogen bomb, the *Nautilus*, and a large civilian power reactor, but in practice it provided the proper basis from which an atoms-for-peace program could be launched. The needs for civilian control of the atomic energy and for outer space are alike in terms of the search for peace. Furthermore, the prospect of better accomplishment in civilian hands is inviting.

The current congressional hearings on military preparedness have shown repeatedly the inherent difficulties within the Department of Defense on major research and development projects, particularly in the missile program.

Assuming then that policy and promised accomplishment dictate the assignment of the space vehicle project to a civilian agency, the choice would be between a new or an existing agency.

The advantages of a new agency could be in the desirability of fresh approach and new administration to cope with a unique problem. A new agency lives in a fresh political climate free from the disputes of other years, and it could prosper in this climate. In addition, the policy of space for peace would be fostered by removal from any association with the military or with weapons research present in some existing agencies.

The disadvantages may be these: Time, which may be of the essence, would be lost in staffing and in building facilities. Short of an expensive crash effort up to 2 years could be lost, assuming the need for new laboratory facilities. There would be competition for scientists and engineers and while this shortage is not severe today there is no abundance of top people. The scientific explorations

could cross the lines of authority of existing agencies and without the strongest of administration this could prevent the free flow of information, particularly if there was a conflict of information categories under security laws. In this, it is enough to say that in interagency matters priority is of little meaning.

One problem today is that we have so many executive agency committees and other groups in scientific and technical affairs and the creation of a new agency would seem to lead to additional confusion and possibly rivalry.

The alternative is placing jurisdiction in an existing civilian agency. There may be several from which to choose but the Atomic Energy Commission appears to be the most logical choice. The AEC nuclear rocket project—Project Rover—provides a basis for further efforts at large scale nuclear propulsion. There is ample scientific evidence that nuclear propulsion offers the best hope for propulsion of a space vehicle with its powerful and long-lived fuels and tremendous power potential. But even without this, an assignment to the Commission is tempting because it is a going agency and has the best laboratory complex in the Nation, perhaps in the world. These laboratories, range from the reactor and weapons centers to the medical facilities at Brookhaven, N. Y. The Service functions of the Commission could service an additional project without much additional expense, and savings would result from this choice as compared to using a new agency.

There may be a disadvantage in the presently controversial aspects of the Atomic Energy Commission's role in power reactor development and in other things. On balance, though, the one compelling argument for assignment to the AEC could be the existence of the very excellent AEC laboratories. At locations such as Los Alamos and Livermore many hundreds of the Nation's best scientists have made outstanding contributions and have a stake in the surrounding communities. Their accomplishment merits assignment of tasks which could assure the future of their laboratory.

For the most part the laboratory facilities would require little modification in the early stages and perhaps this would be true later. Many of the types of personnel and facilities required for advanced types of propulsion, such as ion propulsion, are already in abundance at AEC laboratory installations. Physicists and mathematicians have the computer facilities and other tools which are equally adaptable to atomic and to space projects. Accelerator, electronic, and reactor facilities are also a normal part of such laboratories.

While there is controversy over the best method of attainment the overall developmental record of the AEC is good and for the most part we have surpassed the Soviet Union, up to the present, with atomic development.

The record of the AEC includes the building of the H-bomb, developments for a nuclear Navy, a diversified family of weapons, as well as important peacetime accomplishments in developing a broad and diversified small-scale power technology.

If it might be said that the AEC has no direct experience in space matters except for the Rover and related projects such information could be obtained from an advisory body.

The Joint Committee on Atomic Energy would be the watchdog committee of the Congress over such an enterprise were it assigned

to the AEC and here the experience of its committee members would be of great value. The committee has been intimately acquainted with broad scientific projects over the years in its studies of atomic research, development, and production. It made an outstanding contribution to the hydrogen bomb decision.

I might say at this point that we have constantly stressed the fact that, although a scientific advisory committee recommended to President Truman that he should not go ahead with the development of the hydrogen bomb, and although the Atomic Energy Commission voted not to go ahead with the hydrogen bomb, the Joint Committee on Atomic Energy battled on behalf of the H-bomb until President Truman decided to work on it against the advice of the scientists. Even then we achieved it only a few months ahead of the Russians. I can speak freely, because at the time this fine accomplishment took place I was not a member of the Joint Committee on Atomic Energy.

The joint committee also pushed for the building of the *Nautilus*. It has made a careful study of radioactive fallout and a host of other things, and I hope it will be equally effective in pushing for an outer space program.

It is for these reasons, Mr. President, that I have introduced the bill and have suggested that the Atomic Energy Committee should handle the operations under the proposed legislation. (See the Section of this report on bills and resolutions.)

[Congressional Record, Senate, January 27, 1958]

THE SCIENCE AND TECHNOLOGY ACT OF 1958

Mr. HUMPHREY. Mr. President, on behalf of my distinguished colleagues, the senior Senator from Arkansas [Mr. McClellan], and the junior Senator from Texas [Mr. Yarborough], and myself, I introduce, for appropriate reference, a bill entitled "The Science and Technology Act of 1958."

Mr. President, Russia's advances in recent months in space-science make it imperative that we strengthen the Government's civilian scientific program, particularly in the basic sciences; that we step up the development of scientific manpower; and that we expand our programs in fundamental scientific research, if we are to meet the Communists' challenge for scientific and intellectual leadership of the world.

This bill, which the distinguished chairman of the Committee on Government Operations, the distinguished Senator from Texas, and I, as chairman of the Subcommittee on Reorganization, are today introducing in the Senate, is, in my judgment, a dynamic step toward the achievement of those goals.

The fundamental purpose of the bill is to completely reorganize the civilian science functions of the Government to bring about a coordinated basic scientific program in the national interest.

The objective is to provide the Congress with the means of taking action to meet the urgent need for a greatly expanded program of research, education, and technological development, which is imperative if the United States is to maintain its position of leadership upon which the hopes of the free world depend.

Mr. President, Members of the Senate will note that the declaration of policy set forth in title II of this bill states that the United States Government shall provide for creative scientists both the necessary facilities and the proper environment so essential to the conduct of basic research. In my opinion, the concept expressed in this title of the bill goes to the very heart of the matter of our growth and survival as a Nation.

In essence, this bill would: First, create a Cabinet Department of Science and Technology in which would be coordinated the civilian scientific functions of the Government; second, provide for a scientific scholarship program; and third, establish national institutes for scientific research in the basic sciences, each of which I will discuss briefly for the edification of Senators subsequently in my remarks.

The bill I introduce today was prepared by the staff of the Senate Committee on Government Operations under the direction of the Senator from Arkansas [Mr. McClellan] and myself. Its provisions are tentative, since they have not been fully considered by all members of the Committee on Government Operations, and are subject to action by the committee, following hearings, through amendments, deletions, or the addition of new provisions or titles.

This bill, as presently drafted, contains four titles, Mr. President. Its objective is to insure that consideration be given to the development of a coordinated program covering all Government civilian scientific agencies, activities and functions.

Certain aspects of the bill, particularly titles III and IV, may be considered by other congressional committees which may have jurisdiction over these matters. Some members of the Committee on Government Operations, including myself, have already sponsored proposals dealing with the development of civilian science activities in the field of education, which have been referred to other committees. Therefore, consideration will be given, after hearings have been held before the Subcommittee on Reorganization, which I intend to schedule shortly, to deferring action on those titles dealing with scientific education and the use of counterpart funds. This would permit the appropriate jurisdictional committees to give consideration to those proposals, as well as to related bills already referred to them.

The bill, Mr. President, would authorize the appropriation of $580 million over the next 8 years to establish a Federal-State program of scholarship loans for the education of students beyond the secondary school level in the physical sciences, biological sciences, mathematics and engineering. The loans, not to exceed $1,500 per student, per academic year, for not more than 5 years, would be made from a revolving fund established in the Treasury, which also would be used for insuring loans made from private sources.

To encourage State assistance in making student loans, the bill would also authorize direct grants up to $200,000 to any one State in any fiscal year to meet operating expenses of nonprofit corporations chartered for the principal purpose of making loans to qualified students. The program, which would be directed by the Secretary of the proposed Department of Science and Technology through a Bureau of Student Loans, would be directed toward providing educational assistance to students in the fields of physical and biological sciences, mathematics, and engineering.

The bill also authorizes the Secretary of Science and Technology to use counterpart funds to establish programs outside the United States for collecting, collating, translating, abstracting, and disseminating scientific and technological information, including the conducting of cooperative programs in basic and applied science and research between the United States and other nations.

Under the provisions of this proposed legislation, Mr. President, the following existing Government organizations would be transferred to the Department: The National Science Foundation—for administrative purposes—the Patent Office from the Department of Commerce, as well as all functions of the Secretary of Commerce with respect to the Patent Office; the Office of Technical Services of the Department of Commerce, as well as all functions of the Secretary of Commerce with respect to that office (including functions vested in the Secretary of Commerce relating to the dissemination of technical information); the National Bureau of Standards from the Department of Commerce, as well as all functions of the Secretary of Commerce with respect to that Bureau; the Atomic Energy Commission (for administrative purposes), which would be known as the Atomic Energy Administration of the new Department; and the following functions of the Smithsonian Institution—the Division of Astrophysical Research, the Division of Radiation and Organisms, certain functions relating to the Canal Zone Biological Area, and certain functions relating to the exchange of scientific publications being administered through the International Exchange Service. Any other functions of the Smithsonian Institution determined by the Director of the Bureau of the Budget to relate primarily to scientific research also would be transferred by the bill.

Functions transferred from the Office of Technical Services would be administered through a component of the new department to be known as the Bureau of Technical Services. The Bureau of Technical Services also would have the responsibility (a) to develop a complete science information program, utilizing all facilities of the Federal Government now vested in agencies which operate related programs; (b) to acquire, in cooperation with other public or private agencies, scientific literature, both from foreign and domestic sources; (c) to establish necessary facilities within the Bureau, or in other public or private agencies, to collate, declassify, translate, abstract, index, store, retrieve, and disseminate information essential to the development of scientific and technological programs as may be determined to be in the national interest and consistent with security requirements; and (d) to encourage the elimination of duplication of effort through the integration and coordination of functions vested in the Bureau and in other agencies.

The Bureau also would have the responsibility (a) to develop mechanical aids for collating, translating, abstracting, indexing, and rapidly retrieving scientific and technological information under the control of the Federal Government, and to coordinate such data as may be available from other sources; (b) to establish rules and regulations governing the distribution of publications as may be necessary to assure maximum utilization, including the assessment of such fees as may be deemed appropriate; and (c) to undertake through the facilities available to the Secretary, including educational or research institutions and private laboratories, the establishment of such addi-

tional services as may be required to further scientific, engineering, and technological research and to aid in the development of inventions, discoveries, products, processes, and techniques.

All functions of the National Bureau of Standards would be administered by the Secretary of the new department. A separate component would be established to administer certain laboratory functions being carried out by the Bureau of Standards at Boulder, Colo. As stated previously, the National Science Foundation and the Atomic Energy Commission would be transferred to the new department, where they would continue to exercise their present functions, subject to the supervision and direction of the Secretary of Science and Technology.

The research institutes which the Secretary of Science and Technology would be authorized to establish or support would include basic and applied research in the fields of mathematics, engineering, the physical and biological sciences, and, as deemed appropriate, the social sciences. Such research centers would be operated largely by private, nongovernmental institutions, on a nonprofit basis, with financial support from the Federal Government.

Mr. President, in this connection, I ask unanimous consent that staff memorandum No. 85-2-2 prepared by the staff of the Senate Committee on Government Operations dated January 10, 1958, which provides additional information relating to the proposed Cabinet department, the scholarship program, and the national research institutes, be incorporated at this point in the record as part of my remarks.

SCIENCE AND TECHNOLOGY ACT OF 1958

The following is a brief analysis and explanation of the bill prepared by the staff, as set forth in the committee print dated January 8, 1958.

TITLE I—DEPARTMENT OF SCIENCE AND TECHNOLOGY

This title proposes to create a Department of Science and Technology. The functions of the National Science Foundations and other Federal civilian science agencies operating on a governmentwide basis would be transferred to the new Department. The NSF would continue to operate under its existing authority, but would be subject to the supervision and direction of the Secretary. If approved, the NSF and the AEC, proposed to be incorporated within the new Department, would receive Cabinet level representation.

The Office of Technical Services, Department of Commerce, which would be transferred to the new Department, would be elevated to a Bureau of Technical Services. All existing authority vested in the OTS would be transferred to the new bureau, with additional broad authority to establish a central agency for gathering, collating, translating, abstracting, indexing, storage, retrieval, and full utilization of all available scientific data and techniques.

The Patent Office and the National Bureau of Standards would also be transferred from Commerce to the new Department, with all existing authority. An additional provision is included to

set up the Boulder Laboratories as a separate component, outside the National Bureau of Standards, since these laboratories have now become an operating agency and should be set up independent of the NBS.

The proposed transfer of the Atomic Energy Commission to the new Department would not alter its present functions, but would change it from a commission to an administration, for coordination within the departmental structure under the supervision and direction of the Secretary.

Title I also provides that all operating functions of the Smithsonian Institution be transferred to the new Department, leaving it only supervision over the museums and the Washington Zoo.

It will be necessary for the committee, following hearings, to make some determination as to what other Federal agencies should be transferred to the new Department, such as the National Advisory Committee for Aeronautics, Weather Bureau, Airways Modernization Board, Coast and Geodetic Survey (Commerce), Geological Survey (Interior), and, possibly, some other science functions performed by agencies now operating within the Departments of Interior, Commerce, Agriculture, and Health, Education, and Welfare, and certain other science functions now vested in independent agencies.

TITLE II—NATIONAL INSTITUTES OF SCIENTIFIC RESEARCH

This title is designed to encourage the establishment of scientific research centers for the conduct of basic and applied research by making available adequate financial support necessary to attract, and utilize to the fullest possible extent, the most talented, qualified and creative scientists in the Nation.

It would authorize the Secretary to establish or support one or more scientific research centers in the physical and biological sciences, mathematics, and engineering, and, as may be required, in the social sciences. Such research centers would be operated largely by private, nongovernmental institutions, on a nonprofit basis, with financial support from the Federal Government. However, the Secretary would be authorized to establish and operate certain types of applied scientific research centers, either directly or on a contract basis through nongovernmental organizations, whenever the national interest required and sufficient economic incentive does not exist for the undertaking of such research by nongovernmental organizations without governmental support. Provisions have been included to avoid duplications of existing available research facilities, and to require the Secretary to report annually to the Congress with respect to the research institutes supported or established, the nature of the programs undertaken, and the cost of such programs.

TITLE III—SCHOLARSHIP LOANS

This title directs the Secretary of Science and Technology to establish a program to assist individuals to obtain an education beyond the secondary-school level in the physical and biological sciences, mathematics, or engineering. It further provides for

the creation, in the Department of Science and Technology, of a Bureau of Student Loans.

According to the terms of the bill, a special fund to be known as the Federal Education Loan and Loan Insurance Fund would be established in the Treasury, to be used as a revolving fund for insuring private-loan sources. The loans could not exceed $1,500 per student for any academic year of education, and could not be made for more than 5 such years of education. These figures are suggested merely as a base, upon which the committee will be able to make its own determination as to the total annual amount of the loan and the extent of coverage.

To encourage State assistance in making student loans available in the fields of the physical and biological sciences, mathematics, or engineering, this title authorizes the Secretary to make direct grants up to $200,000 to any State in any fiscal year. These grants would be kept in a separate fund, under the control of the State agency charged with chief concern over institutions of higher education, and would be made available to help meet organization and operating expenses of nonprofit corporations chartered for the principal purpose of providing loan programs for students of the State to participate in the loan program.

For direct-loan purposes, the draft bill tentatively provides, subject to final committee determination, that there shall be appropriated to the fund $40 million for the fiscal year beginning July 1, 1958. For 1959, the figure would be $60 million; for the fiscal year 1960 the sum of $80 million; and for each of the fiscal years beginning July 1, 1961, through 1964, the sum of $100 million annually, making a total eventual revolving fund of $580 million in 8 years. The loans would bear interest at 2 percent a year or "such higher rate as shall be fixed by the Secretary"; it is contemplated that the rate would be equal to about one-half the going rate of commercial loans. The Secretary would be authorized to make up the difference in interest needed to obtain the loans to the colleges and universities allocating such loans. No interest would accrue prior to the commencement period of repayment or 1 year after ceasing full-time study, whichever would come sooner. The borrower would have 10 years in which to repay (unless he is employed by the Federal Government and conforms to other provisions of this title).

Provision is made for the distribution among the States of loans and loan insurance by the Secretary in accordance with such formula as he determines from such information as may be reasonably available to him (1) to be best suited for the purposes of the Science and Technology Act, and (2) to recognize the needs of each State based, among other criteria, on the number of students graduating from secondary schools, the number of young people in selected specific age categories between 17 and 21, the per capita income in such State, and the burden which the State is bearing in higher education through facilities, direct assistance, or otherwise.

The bill stipulates that loans shall be used only to defray costs which are incurred while pursuing a full-time course of study in the fields of physical and biological sciences, mathematics, and

engineering; and in order to be eligible for them, applicants first must be accepted by a recognized institution of higher learning.

The title further provides that the Secretary may cancel payment of any loan to any individual recipient who, upon completion of his course of study, accepts full-time employment in the Federal Government in the fields of the physical or biological sciences, mathematics, or engineering. Such loans may be canceled at the rate of $1,500, plus any accrued interest, for each year in which the recipient is employed in a full-time position in the physical or biological sciences, mathematics, or engineering in any agency of the Federal Government or project or program designated by the Secretary.

The title provides for Government insurance on loans made to students by private sources, including universities and colleges. Administration of this program would be largely concentrated in the institutions themselves. The loan-insurance plan provides for payment to financial institutions and institutions of higher education of 90 percent of any losses suffered on loans.

TITLE IV—OVERSEAS PROGRAMS

This title would authorize the Secretary to establish cooperative programs outside of the United States for collecting, translating, abstracting, and disseminating scientific and technological information and to conduct and support other scientific activities. In carrying out the purposes of this section, the Secretary is authorized, in cooperation with governmental and other agencies, both of the United States and other countries, to use counterpart funds available for expenditure by the United States. The requirement for repayment out of appropriations by agencies using counterpart funds for the purposes of the Act is waived.

The committee may wish to give consideration to extending this provision, if approved in principle, to cover other counterpart funds where needed. The utilization of these funds would require the country in which such funds are available to agree to support the programs to which allocations are proposed to be made. It might be feasible, in certain instances, to extend the authority for the actual construction of basic and applied science and research laboratories and other facilities in the countries in which the funds are available in order to utilize fully the potential benefits of the program.

[Congressional Record, January 29, 1958]

UNITED STATES SATELLITE'S NEED OF GOOD WILL STRESSED

Extension of remarks of Hon. Lyndon B. Johnson of Texas in the Senate of the United States, Wednesday, January 29, 1958

Mr. JOHNSON of Texas. Mr. President, perhaps in our natural preoccupation with matters of national defense this year we have given

the people of the world the impression that the United States has become a materialistic nation overly concerned with weapons and missiles and rockets—no longer guided by spiritual values.

I must admit my own distress over this question. It has been essential that we arouse our people to the challenges of the age of space. I do not want, however, a concentration on military issues to cause us to lose sight of the ultimate objectives—scientific advancement for peaceful use. * * *

[Congressional Record, January 31, 1958]

SCIENCE ADVISER TO THE DEPARTMENT OF STATE

Mr. HUMPHREY. Mr. President, I am sure that many Members of the Senate were pleased to hear on January 13, 1958, of the appointment of Dr. Wallace R. Brode as the science adviser to the Department of State.

I ask unanimous consent that a press release issued by the Department of State on the occasion of Dr. Brode's appointment be printed at this point in my remarks.

There being no objection, the press release was ordered to be printed in the Record, as follows:

DR. WALLACE R. BRODE APPOINTED SCIENCE ADVISER TO DEPARTMENT OF STATE

The Department of State announces the appointment of Dr. Wallace R. Brode as science adviser. He was sworn in by Secretary of State Dulles at 5 p. m. today and immediately assumed his new duties. Until his present appointment, Dr. Brode was Associate Director of the National Bureau of Standards of the United States Department of Commerce. His election as president of the American Association for the Advancement of Science was announced last month. He was formerly professor of chemistry at the Ohio State University. Dr. Brode will advise the Secretary and other Department officers on matters relating to scientific developments which affect foreign policy, and will direct the work of science attachés overseas. He was recommended for the position by Dr. James R. Killian, Jr., special assistant to the President for science and technology. Dr. Detlev W. Bronk, president of the National Academy of Sciences, and Dr. Alan T. Waterman, director of the National Science Foundation.

In addition to strengthening the Office of the Science Adviser by the appointment of Dr. Brode, the Department will augment Embassy offices by assignment of science attachés to certain foreign capitals.

Dr. Brode's appointment signals a fresh emphasis on a postwar Department of State function curtailed in 1955 in order that the program might be reviewed and plans made for the future. Reexamination during the past year indicated the growing importance of activities of scientists as a significant element in formulating foreign policy and in carrying on relations with other governments. The new work will therefore be oriented more closely than before to the objectives of the Department and the Foreign Service. Both the science adviser and the science

attachés will be responsive to requirements of other Government departments that carry on scientific activities abroad, since certain of these activities form parts of the pattern of our foreign relations. Dr. Brode will also keep in close touch with Dr. Killian.

As counterparts overseas of the science adviser in Washington, certain science attachés will be appointed to advise and collaborate with political, economic, and other Embassy officers on those foreign-relations questions in which scientific considerations play a part. They will also assist other Federal agencies and private groups in carrying out their programs of scientific cooperation abroad, such as those of the National Science Foundation, International Cooperation Administration, National Academy of Sciences, etc. Like other members of the Foreign Service, they will keep the Department currently informed of developments significant for international relations.

Commenting on the appointment of Dr. Brode and the responsibility he is to assume, Secretary of State Dulles said:

"I am most gratified that such a distinguished scientist as Dr. Brode has accepted the post of science adviser and will apply to a Government function the wisdom and skills for which he has long been known in professional and governmental fields. Dr. Brode enjoys the confidence of his colleagues at home as recognized by his recent election to the presidency of the American Association for the Advancement of Science and commands the respect of scientists and others abroad. His international vision and his dedication to scientific development will be powerful factors in helping to bring the significance of science into the realm of foreign relations and in helping to promote the progress of scientific endeavor throughout the world."

Science attachés will be assigned to several United States embassies in Europe and Asia in the near future.

[Congressional Record, January 31, 1958]

OUTER SPACE, THE NEW FRONTIER

Extension of remarks of Honorable Alexander Wiley, of Wisconsin, in the Senate of the United States, Wednesday, January 29, 1958

Mr. WILEY. Mr. President, one of the most historic suggestions in the postwar decade has come from the Secretary of State.

Speaking before the National Press Club, Secretary Dulles urged the control of outer space through the United Nations.

The Secretary pointed out that, because we are at the threshold of the exploration and conquest of outer space, the United Nations is—at least temporarily—in an excellent position to provide effective international control against military conquest from outer space. But time will fast run out. As more and more missiles, with longer and longer range are developed, and as the size of missiles is contracted, this new military technology may become almost as difficult to control as is nuclear technology today.

Under the circumstances, speed is of the essence, in beginning the long spadework which will be necessary if this great opportunity for peace and progress is not to be lost to mankind.

Fortunately, foreign policy experts are hard at work on this subject. I hope that their labors will prove fruitful and that the beginnings of an agreement may be worked out between Soviet Russia, ourselves, and the other nations.

Meanwhile, the American bar and the international bar are giving their serious consideration to the tremendous number of legal aspects which arise from a purely civilian standpoint, as well, on this subject of travel through outer space.

[From the New York Herald Tribune of January 19, 1958]

POLICING SPACE

The control of outer space, long the province of improbable heroes of science fiction and comic strips, has abruptly been brought down to the green baize tables of diplomacy. President Eisenhower has called for an international agreement to ban from space the weapons of war. Secretary of State Dulles has followed with a suggestion for an international police system to the same end—while there is yet time.

The time element is acutely important. When the development of atomic energy was in its infancy, at the end of World War II, a system of controls might have been established to insure against nuclear war. The United States offered such a system; the Soviet Union rejected it. Now the proliferation of completed weapons, of plants and sources of fissionable materials has made an overall program of international inspection and control extremely difficult, if not impossible. As Mr. Dulles pointed out, some of the same considerations apply to the invasion of space. The large, cumbersome devices used to penetrate the world atmosphere could be controlled by an inspection system now. But, as the Secretary of State warned, "we cannot say with certainty that in 10 years the mechanics of penetrating outer space will become so refined that we will be up against * * * an impossibility."

* * * * * *

The task of introducing order into the nationalist confusion of space flights will not be easy. After centuries of the painful development of maritime law there is still acrimonious debate over such elementals as the extent of national jurisdiction over the sea—3 miles, or 12? Air travel is bedevilled by problems of national "air space." One question which would surely arise, in creating an international space agency, is where does "air space" end and outer space begin? Will man be any more successful in policing the stratosphere than in preventing wars and crimes upon the earth?

Yet the very fact that outer space offers a clean slate for the creation of new international institutions is in favor of the attempt. It offers, too, an exciting appeal to the imagination—a chance for constructive work in an untouched field. If successful, this could open the way for similar efforts in international

cooperation for peace; efforts that have been stifled by earthbound rivalries, old fears and hatreds. And—the most sobering yet demanding thought of all—if space is not regulated, humanity may be extinguished by its own devastating creations.

"Now I see no obstacle in the way of establishing an effective, all-inclusive system of supervision," said Mr. Dulles. "I think there is an opportunity here that is almost staggering in its * * * tragic implications if we do not do it."

The world has a right, indeed a duty, to insist that the Soviet Union measure up to this opportunity. The Kremlin calls for a summit meeting. As Mr. Dulles again pointed out, a conference that produced nothing but vague and peaceful platitudes would be positively dangerous. Policing space is one great and concrete accomplishment that East and West might achieve in a summit meeting after due preparation. And the United States can be proud of the leadership which its President and Secretary of State have displayed in insisting that space shall be brought within the rule of law.

[Congressional Record, February 3, 1958]

THE SIGNIFICANCE OF THE AMERICAN SATELLITE EXPLORER

Mr. JOHNSON of Texas. Mr. President, on Friday, some very anxious moments for our people came to an end. An American satellite was put into orbit and at this moment is circling the globe.

The Explorer is a triumph of persistence against great odds. It represents the dedicated work of men like General Medaris, Wernher von Braun, and numberless scientists and technicians who will never receive their fair share of credit.

Our satellite is very aptly named. It is truly an explorer—a representative of the free people searching for the facts of a totally new dimension into which men and women will soon step. And, in its search for facts, it brings us face to face with a sharp reality which we cannot ignore.

Neither the Explorer nor its Soviet predecessors can be considered military weapons. They are merely collectors of data which they are transmitting or have transmitted back to earthbound men.

But the facts and figures of the physical world are of a peculiar nature. They have no loyalty, no patriotism, no system of morality and ethics. They are available for the advancement of mankind, or for the destruction of mankind.

The science of biology has given us penicillin and germ warfare. The science of chemistry has given us medicine and poison gas. The science of physics has given us new sources of useful power and the hydrogen bomb.

Now a new science—astronautics—is moving rapidly from the drawing board to the workshops. Will it give us new frontiers or new forms of total devastation?

To continue the arms race at this time will inevitably bring us to the point of no return. There must be action now—now, while there is still time to bring the new forces under control.

It is not difficult to forecast the future if the present situation continues. This will be the world of the manic depressive—high points

of elation when "we" make an important advance; low points of despair when "they" outstrip us.

And at some interval when "we" are at a low point and "they" are at a high point, somebody is going to press the button.

There is no point in deluding ourselves that "we" can just call off the arms race on our own initiative. There is no point in debating why they do not call off the arms race at their own initiative.

The only worthwhile discussion is what is said in the effort to find ways and means of breaking the logjam—of bringing the tragedy of the cold war to an end.

This is the time to act—now, while the satellites are searching for facts instead of for targets.

I would hope that our leaders would give urgent consideration to a proposal for joint exploration of outer space by the United Nations. I would hope that this proposal could be pressed earnestly, vigorously, and with all the sincerity at our command.

No one would stand to lose by this proposal. The alternative is a disorderly arms race which can end only in death and destruction.

For the moment, our prestige is at a high point. There is no better time for a display of the generosity, the initiative and the constructive desire for peace which lies in the soul of the American people.

The president of the United Nations General Assembly—Sir Leslie Munro—has spoken the desires of the world. He says the nations are looking for leadership in the drive into outer space.

We have heard this morning that our President has received another letter from Soviet Premier Bulganin. It rejects the idea of a foreign ministers' conference as a precondition to a summit conference.

Whatever the note may say, however, there has never before been a more golden opportunity to bring this war-weary world to peace. A strong and determined proposal to cooperate now may save all of us from a strong and determined—and probably successful—effort to destroy humanity later.

Mr. President, I ask unanimous consent to have printed in the Record at this point as a part of my remarks a United Press dispatch from the United Nations headed "U. N. Talks Urged on Outer Space."

There being no objection, the dispatch was ordered to be printed in the Record, as follows:

U. N. TALKS URGED ON OUTER SPACE

UNITED NATIONS, N. Y., January 31.—General Assembly President Sir Leslie Munro, of New Zealand, tonight suggested a U. N. conference of scientists and diplomats within the next 2 or 3 months to study control of outer space.

Munro, who has spoken several times of the need to get United Nations action started to deal with the age of space, made the suggestion in a broadcast interview recorded for U. N. radio.

Munro said that despite many references by President Eisenhower and others to the need for space control, there has been no initiative except in embryo to bring the issue to the U. N.

Mr. SALTONSTALL. Mr. President, will the Senator yield?

Mr. JOHNSON of Texas. I yield to the Senator from Massachusetts.

Mr. SALTONSTALL. From listening to the statement of the Senator from Texas, I gain the impression that what he desires is that the leadership in the administration take every possible step to try to see that the satellite race does not end in a more critical military controversy, but will lead to a greater opportunity for attaining world peace. The Senator from Texas desires that we take the lead. Whether such leadership is exercised through the United Nations, or otherwise, I assume that the Senator from Texas desires that we take the lead; and we all concur in that desire.

Mr. JOHNSON of Texas. The Senator is correct. I think the leadership might very appropriately come through the United Nations, and I have so suggested. Last Friday the General Assembly President, Sir Leslie Munro, suggested that there be a United Nations conference of scientists and diplomats in a very short time, to enter into a study of the subject of control of outer space.

I am happy to have the Senator from Massachusetts associated with me.

Mr. SALTONSTALL. What we need to do is to take the first steps, whatever they may be. We hope they may be taken through the United Nations. They may be taken in some other way in the wise discretion of those in the responsible positions in the administration; but what we need to do is to take the first steps.

Mr. JOHNSON of Texas. I think we have a golden opportunity at this moment, and I hope we shall take advantage of it.

Mr. KEFAUVER. Mr. President, will the Senator yield?

Mr. JOHNSON of Texas. I yield.

Mr. KEFAUVER. I highly commend the majority leader for his statement today. It is in line with proposals and suggestions which he has made from time to time in the past. It seems to me that his proposal offers us the opportunity to regain the initiative, and win for ourselves the esteem of all the peoples of the free world, and perhaps even of the plain people behind the Iron Curtain as well. I believe that the proposal of the Senator from Texas to write the rules and regulations for the control of outer space under the auspices of the United Nations is good, for two reasons.

In the first place, the United Nations is the only organization with a world membership.

In the second place, taking the steps proposed would build strength in the United Nations for further useful efforts in the quest for ways and means of reaching peaceful settlements of the contentions in the world.

I hope the suggestions of the Senator from Texas will be followed by the President and by the American representative at the United Nations.

Mr. JOHNSON of Texas. Mr. President, the need for the type of cooperation of which I am speaking was well pointed up by an editorial in the New York Times this morning. I ask unanimous consent that its editorial be printed in the body of the Record as part of my remarks.

There being no objection, the editorial was ordered to be printed in the Record, as follows:

[From the New York Times of February 3, 1958]

COOPERATION IN SPACE

The tempo of modern scientific advance is so swift that even a decade hence the earth satellite feats of recent months, both Soviet and American, may be regarded as but faltering steps toward the conquest of space. Yet modest as the present achievements may seem by the standards of the future, the present period may well be crucial It is now that patterns and precedents regarding space exploration are being set, and depending upon their nature these present patterns and precedents can help determine whether man's strides into the cosmos shall eventually form a bright or a dark page in the annals of our species.

With that realization in mind, it is highly fortunate that both the Soviet sputniks and our own Explorer satellite have been launched as part of the program of the International Geophysical Year. That program is the most extensive example to date of integrated international scientific research. It was in the spirit of the cooperation which is central to the International Geopsysical Year that the code used in the radio transmissions from our satellite has been made available to scientists the world over. It is an unhappy violation of the spirit of that cooperation that the Soviet Union has not similarly made its codes publicly available, and there will undoubtedly be many who will regard it as more than a chance coincidence that only a few hours after the Explorer was launched International Geophysical Year headquarters in Brussels was informed that preliminary information from the Soviet sputniks was on its way.

The International Geophysical Year period ends with this year, but man's efforts to reach farther into space will surely continue indefinitely. That fact alone makes it urgent now to coordinate all nations' space exploration, and to assure, as President Eisenhower has suggested, that space be an area of human peace. Both the responsibilities and the opportunities before the United Nations in this situation are clear. Certainly all human beings who recognize the potentialities for good or for evil which the new space age we have entered contains, will hope that those who direct the United Nations and the leaders of its member nations will respond quickly to the current need, before it is too late.

Mr. WILEY. Mr. President, I listened with interest to the discussion precipitated by the distinguished majority leader. I am sure that his suggestions would lead to a consummation desired by everyone.

However, we must be careful, in pursuing whatever course we decide upon, to bear in mind what has happened in the past. We realize that we have tried disarmament at times when people did not disarm. We have had, as has been indicated, 52 experiences with the Kremlin, involving 52 agreements, only 2 of which the Kremlin kept.

Of course that does not mean that we should stop seeking to find a way to follow what the Secretary of State has suggested we do, namely, to get control of outer space through an agreement of some kind. A few days ago there occurred in the Senate a discussion dealing with Antarctica. There again we are seeking to get an agreement with the Kremlin which will be kept by them and not broken, as was the case with the other 50 promises that were made by the Kremlin. Therefore, as we seek to find the answer, let us keep our powder dry.

THE PLACING OF THE UNITED STATES ARMY SATELLITE INTO ORBIT

Mr. COOPER. Mr. President, the American people, and indeed millions of others throughout the world, are happy that on last Friday evening the United States Army placed a satellite into orbit. All congratulations are due to the Department of the Army, Secretary of the Army Brucker, Gen. John B. Medaris, Dr. Wernher von Braun, and indeed all of the devoted scientists, technicians, and engineers, in all the services and in civilian life, who contributed to this magnificent achievement.

In our exultation, we should not forget that the primary purpose of launching a satellite is to extend man's knowledge for peaceful purposes. Dr. Joseph Kaplan, Chairman of the United States National Committee for the International Geophysical Year, has said:

> The satellite program is one of the boldest, most imaginative steps taken by man: it represents the first stage in his acquisition of direct knowledge of the universe far beyond the earth's surface and far beyond the scope of aircraft, balloons, and even conventional research rockets.

President Eisenhower respected this valid truth and our commitment to other nations and to world knowledge, when, after the successful launching of Explorer, he released immediately scientific data concerning its flight.

And now, to keep our effort devoted to knowledge and to peaceful uses, it seems to me that the President and the administration must consider placing eventually development, for peaceful and scientific purposes, under civilian control, rather than military.

But it is also of tremendous consequence to our military security that the launching of a satellite, even though it may not be as large as the Soviet satellites, demonstrates that the United States possesses the scientific knowledge and techniques to develop the precision, as well as the power, to place a satellite in orbit, for both power and precision are requisite for the development and production of the ICBM and IRBM.

It is also the proof that President Eisenhower and the Department of Defense have been working steadily and successfully toward this end. It is hardly known that, during the past few years, over $17 billion have been obligated for research and development and missile production. An estimated 200,000 people have been engaged in federally financed missiles programs. Contracts have been given to universities and private businesses for basic and applied research,

and 5,000 civilian scientists, engineers, and technicians are engaged in the Department of Defense, itself, in missile work.

But, even with this accomplishment, the main task is still ahead. We cannot slacken our efforts to step up national military preparedness—and to improve educational standards, which at last will determine our future in the world.

Only yesterday the Vice President of the United States made it clear that these were the goals of this administration and of our people.

An editorial in the New York Times of yesterday, which I shall have placed in the Record, concludes its praise of the American achievement with these words:

> Let us keep our dignity. Let us not make this moment the occasion for a faster, more maddening competition. Let us have harmony among ourselves. Let us hope that when our satellites sweep with the Russian satellites through the abysses of space it will be the thought of peace and not of war that will be uppermost and outermost.

The scientists and many in the Congress have followed this precept. I pay particular tribute to the Senate Armed Services Committee, under the able leadership of the distinguished senior Senator from Georgia [Mr. Russell], and to the distinguished ranking minority member of the Armed Services Committee, the senior Senator from Massachusetts [Mr. Saltonstall]: In addition, I wish to pay tribute to the valuable work and patriotic tribute of the Senate Preparedness Subcommittee, under the very able and nonpartisan leadership of the senior Senator from Texas [Mr. Johnson].

But above all, during these difficult months, since the Soviets launched their satellite, when cries arose from persons of lesser judgment and unsure balance, President Eisenhower and Vice President Nixon, without avoiding the harsh facts, have maintained the highest standards of national dignity and honor, and have given balance and a sense of direction to the Nation.

Mr. President, I ask unanimous consent that the editorial I have referred to be printed in the body of the Record, at this point of my remarks.

There being no objection, the editorial was ordered to be printed in the Record, as follows:

THE LEAP INTO SPACE

> The American people have been understandably exultant in this first week-end of the Explorer satellite's cruise through space. Many elements have combined to produce this emotion. After long weeks of frustration it was thrilling to see that the Jupiter C rocket was able to succeed in its very first try. We now know that, whatever Soviet propaganda may say in the future, it can never again be as stinging and as mocking as it has been these past weeks while Soviet sputniks have coursed alone through the heavens. And the Explorer satellite now in orbit is the concrete symbol that the United States contribution to mankind's conquest of space will be of major proportions.

Inevitably the Explorer satellite will become an element in the political and propaganda war which is so central a feature of our time. The Soviet Union assured this consequence when it chose to exploit its own previous two sputniks as symbols of its military power, threatening bluntly that the same rockets that sent the sputniks into space could deliver hydrogen bombs anywhere on the earth's surface.

Yet it was not for purposes of war that the Explorer was shot into space last Friday night. President Eisenhower has already made clear that it is the purpose of our foreign policy to make the cosmos an area of peace rather than an arena for the combat of nations. Mr. Khrushchev charged in Minsk recently that our President was inspired by the desire to deprive the Soviet Union of a weapon, the intercontinental ballistic missile, which it alone now has. But if the Explorer reminds the Soviet leaders that any lead they may have in this area may be transitory it may well make them more amenable than they have been so far toward giving a positive response to the President's gesture.

Space has now been internationalized in the sense that man-made satellites of two nations are now traveling through it at enormous speed. As we have urged before, we feel it is urgent that the question of the control of space be taken up by the United Nations so as to assure that the rapid strides being made toward man's conquest of space be strides of peace and not of war. All humanity has a stake in the issue. The United Nations is the proper agency to assure that all humanity's interests are safeguarded in the incredible new era man is now entering as he breaks the bonds with which gravity has always hitherto bound us and our artifacts to this small planet.

The launching of a satellite into outer space does not by itself represent a scientific breakthrough. As Dr. J. W. Buchta of the University of Minnesota said last week at the meeting of the American Physical Society in New York: "Newton could have calculated the energy needed to launch it and he could have determined the magnitude and direction of the velocity it must be given to be placed in orbit." The act of launching, he pointed out, "is a major engineering feat, requiring great skill and mastery of instruments."

This should enable us to judge the launching of Jupiter-C from a more objective point of view, looking at it rather as a means than as an end in itself, namely, as a powerful new tool for the exploration of the world we live in. As such, it represents a quantum jump into new dimensions of space, earth-bound man being free at last to expand the domain of his limited knowledge, to explore the hitherto forbidden, awesome realm in which some of nature's most vital secrets are being kept hidden from his inquisitive mind. What is thus most important is not so much the tool in itself but the uses man is to make of it, and of the greatly extended mastery of nature the tool will provide him with.

It is certain that the satellite will make nature yield many answers to vital questions put to her. But it is also most likely that, through the agency of Jupiter and many others like it to follow, we will also acquire startling information about the uni-

verse and the forces within its vast domain that will surprise even the most imaginative among her questioners. The answers, it has been said, "may well constitute the most significant and profound discoveries in the physical sciences in the next half century." We are on the eve of discovery of new forces that may make even the discovery of atomic energy rather minor by comparison, from the point of view of its potentialities for the future of man.

As Dr. Joseph Kaplan, chairman of the United States National Committee for the International Geophysical Year, said: "The satellite program is one of the boldest, most imaginative steps taken by man; it represents the first stage in his acquisition of direct knowledge of the universe far beyond the earth's surface and far beyond the scope of aircraft, balloons, and even conventional research rockets."

The contrast between Friday night's proud achievement and the preceding rivalries, postponements, and alternations of secrecy with expansive publicity, is in itself dramatic. Some of our national weaknesses revealed themselves even as we were about to make this spectacular demonstration of our national strength.

We hope these minor episodes will not be repeated. We are now on the threshold of mankind's supreme adventure.

Let us keep our dignity. Let us not make this moment the occasion for a faster, more maddening competition. Let us have harmony among ourselves. Let us hope that when our satellites sweep with the Russian satellites through the abysses of space it will be the thought of peace and not of war that will be uppermost and outermost.

United States Earth Satellite to Provide Broad Scientific Data

Extension of remarks of Hon. Homer E. Capehart of Indiana in the Senate of the United States, Monday, February 3, 1958

Mr. Capehart. Mr. President, I ask unanimous consent to have printed in the appendix of the Record a copy of the release quoting Maj. Gen. J. B. Medaris, commanding the Army Ballistic Missile Agency, with reference to the details of the launching of the scientific earth satellite from Cape Canaveral, Fla.

UNITED STATES EARTH SATELLITE TO PROVIDE BROAD SCIENTIFIC DATA

The United States scientific earth satellite launched by the Army from Cape Canaveral, Fla., today will provide basic scientific data of great value in man's effort to understand the earth and its environment, according to Maj. Gen. J. B. Medaris, commanding the Army Ballistic Missile Agency.

The satellite launching was assigned to the Army by the Department of Defense November 8, 1957. It is a joint undertaking of the Army Ballistic Missile Agency and the jet propulsion laboratory of California Institute of Technology.

Dr. Wernher von Braun, chief of development operations in the missile agency, and Dr. William H. Pickering, director of jet propulsion laboratory, supervised the preparation of the

multistage rocket and the satellite. The project is part of the United States contribution to the International Geophysical Year.

The missile agency was responsible for operation and launching of the booster, or first stage, and guidance system. The first stage consisted of a modified Redstone ballistic missile, a thoroughly tested vehicle now in production for field deployment.

The jet propulsion laboratory assembled the high-speed upper stages, which have solid propellant motors, prepared some of the instrumentation for the satellite, packaged the satellite, and will conduct the task of gathering scientific data from the orbiting payload.

The State University of Iowa, represented by Dr. James A. Van Allen, furnished instrumentation to collect cosmic ray measurements.

The launching vehicle was redesigned from the Jupiter C reentry test vehicle developed by the missile agency and the jet propulsion laboratory.

Telemetered information from the satellite, which is 80 inches long and weighs 30.8 pounds in its cylindrical shell casing, was being received even before it left the launching pad at the missile test center.

Two miniaturized radio transmitters in the forward part of the satellite provide much scientific information which will add to man's knowledge of the earth and its environment, Dr. Pickering reported. It will also help to improve further satellite designs.

The total electronic payload weighs 11 pounds. Total payload weight, including structure and antennas, is 18.13 pounds. Total weight of the orbiting satellite is 30.8 pounds.

Each of the two transmitters telemeters information to ground stations located around the world.

The first transmitter is sending data on the skin temperature of the rear area of the satellite, internal temperature, micrometeorite impact, and cosmic ray counts.

The low-power transmitter, designed by the jet-propulsion laboratory, sends information on the skin temperature of the satellite forward area, the nose-cone temperature, micrometeorite impact, and cosmic-ray counts.

Information on the low-power frequency is received on 108 megacycles, while the high-power transmitter broadcasts on 108.03 megacycles. The low-power transmitter is expected to transmit data for 2 to 3 months; the high-power transmitter for 2 weeks.

Both transmitters are independent from batteries to antenna, to insure reliability in the event of accident or malfunction of an essential part.

All of the instrumentation including the sensing devices was designed and installed in such manner as to withstand the tremendous shock and vibration that occurred during the powered phase of the launch. It is estimated this was equivalent to a force of 100 gravities.

During the power phase of the launch, a temperature-sensing instrument inside the nose-cone tip telemetered information to

ground stations on the aerodynamic heating of the nose cone. This information came in via the low-power transmitter.

"This temperature," said Dr. Pickering, "is difficult to determine analytically, but the range of heating is extremely important to provide launch-design information for future satellites or space vehicles."

"The exterior shell and internal temperatures are instrumented to provide data on primary environment and effectiveness of heat-insulation techniques," Dr. Pickering said. "These data will be compared with calculated shell temperatures and experimentally determined internal temperatures to improve satellite design."

The satellite is at nature's mercy outside the earth's atmosphere. When it is on the dark side of the earth, it radiates heat to the coldness of empty space. When it is on the sun side of earth, it absorbs heat at a high rate. As a result, the temperature of the satellite can fluctuate widely.

The jet-propulsion-laboratory scientists tried to control this wide temperature range to some degree by coating the instrumentation section and the nose cone with stripes of aluminum oxide.

The forward section of the satellite is partially covered by 8 equally spaced stripes of aluminum oxide and each is one-quarter inch in width. The striping is expected to keep the temperature range within a reasonable figure to protect the sensitive electronic components carried on board the satellite.

Calculations by Dr. Van Allen indicated the external skin temperature might range from 70° below zero Fahrenheit to 100° above. The insulation is expected to reduce these limits inside the satellite to approximately 40° and 70°.

Sensors for these temperatures are located in the following places: internal temperature of instrument section, at the aft end of the high-power transmitter; skin temperature number 1, at the fiberglass ring between the instrument section and the final stage motor; skin temperature number 2, at the fiberglass ring between the instrument section and nose cone.

The other telemetered data includes cosmic ray counts of heavy primary cosmic rays as they occur above the earth's atmosphere, and information on the distribution, density, and relative momentum of micrometeorites in space.

In addition to collecting information on the rate and density of tiny particulate bits of meteors in space, the satellite is equipped to detect the abrasive effect of dust-like clouds of micrometeorite particles which have a sandblast effect. For this dual task the satellite carries two sets of instrumentation.

An erosion gage is located near the aft end of the final stage motor. It contains a wire grid made up of 12 wires arranged in parallel

If the satellite runs into a sandblasting cloud of micrometeorite matter, the wire grid will undergo erosion from the abrasive effect so the wires may be cut. As each grid is severed, there will be a small increase in frequency in the low-power transmitter, indicating a micrometeorite five microns in size or larger.

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In addition to the wire grid, the satellite carries an impact microphone with amplifier and scaler. The microphone is in spring contact with the outer shell of the satellite. When a particle of sufficient size and momentum impacts against the shell, the amplified pulse will actuate the scaler.

The output of this scaler controls the frequency of one telemeter channel of the Minitrack transmitter so that when the frequency changes from low to high in the band, it will mean the satellite encountered a large particle.

When the frequency changes from high to low, the satellite will have encountered a large or small particle. Analysis of relative times in the high and low states will indicate the relative size distribution of the micrometeorites. Estimate of the absolute size and momentum of the particles will be made by calibrations selected prior to the launching.

This experiment is being performed in cooperation with the Air Force Cambridge Research Center.

The continuous cosmic ray count will be measured and telemetered simultaneously by both transmitters. Total count of cosmic rays hitting the satellite Geiger-Mueller tube has been scaled down to 32 so that each unit of 32 cosmic rays will cause a step change in frequency in the instrumentation.

The average counting rate expected will produce approximately 32 pulses per second, which will cause a frequency change once each second. On this basis, the system is capable of transmitting cosmic ray information at 40 times the normal rate if such activity comes during intense solar or magnetic storms.

In addition to information received directly from the satellite through its instruments, the vehicle also will provide basic scientific information simply by being in orbit.

Ground observations of the satellite will provide information about the ionosphere, geomagnetic field intensity, and atmospheric density—information that until now was arrived at by calculations based upon indirect evidence.

Accurate optical and radio observation of changes in the satellite orbit may provide basic information as to gravitational anomalies in the earth. The exact amount to which the earth's shape deviates from an ideal sphere can be determined from such observations.

Additionally, worldwide maps may be changed from observations made of the satellite. Geologists have long desired some precise method of accurately measuring distances between continents.

It has not been possible to stretch a tape measure between great land masses, so distances have been computed by triangulation and other methods which are not quite accurate; possible errors may be as large as about half a mile.

Geologists believe that continents drift a few feet a year but up until now there has been no method to establish this as fact. Observations made of the satellite from two stations simultaneously can lead to a precise calculation of distances between continents.

[Congressional Record, February 4, 1958]

THE IMPORTANCE OF WEATHER CONTROL—"WITHOUT VISION, A PEOPLE PERISH"

Mr. WILEY. Mr. President, an article in the Sunday, February 2, issue of the New York Times was entitled "Weather Bureau Fails in Fund Bid."

Its subtitle: "Plea for Expanded Research Rejected in Face of Many Warnings by Scientists."

The theme of the article was that the Weather Bureau has been turned down in its application for more funds for the purpose of forecasting and eventually controlling weather.

In the 1958 fiscal year budget, the administration has provided $2.6 million for the Weather Bureau. This represents, however, only a $45,600 increase over the Bureau's research budget for the current fiscal year.

By contrast, it should be noted that next month there will come a report from the National Academy of Science. It is headed by the eminent scientist Dr. Lloyd V. Berkner. It is expected to recommend very sizable increases in weather research funds. One such proposal may be that a $50 million meteorological laboratory be established by the Government.

Mr. President, the State of Wisconsin has long been interested in weather matters. It is a Wisconsinite who is known as "Father of the Weather Bureau," Dr. Increase Lapham, one of my State's famous scientists, worked out a way of using maps and charts to find out what the weather was going to be, and on November 8, 1870, he sent out his first weather forecast from Chicago.

The reason I mention this general subject today, Mr. President, is this:

AVOIDING A WEATHER-DISASTER PEARL HARBOR

I have spoken on several occasions on the floor of the Senate relative to the need for America's avoiding a nuclear Pearl Harbor. There are other types of grim possibilities of surprise devastation, as well.

According to scientists, it is not beyond the realm of possibility that the Soviet Union might some day be able to control the weather over the American continent. Stranger things have happened.

President Eisenhower has warned us against the total Soviet threat. The Soviet Union will not miss any bets if it can menace us through meteorological warfare, as it menaces us with other kinds of warfare; political, economic, social, psychological, cultural, atomic, as well as conventional weapons.

REDUCING TOLL OF TORNADOES

But, there is a second reason. Each year, this country suffers enormous property damage and loss of lives from various forms of nature's havoc. We have hurricanes, cyclones, tornadoes. And drought, hailstorms, blizzards are an old story to us.

Why should we not make it possible for this country to find the answers to these natural disasters?

Centuries ago, prehistoric man feared thunder, he feared lightning; he did not know where they came from or why. Today, however, man knows the answers to some of these questions. Why should not man make himself more adequate to cope with these problems?

Let me remind my colleagues that a single tornado, a single cyclone, a single hurricane, can cause more damage than the $2.6 million which is being requested for weather bureau research scientists.

In my judgment, the military problem is of course especially important.

We need to step up our research into the weather conditions of our planet and of outer space.

SENATOR WILEY'S REPRINT OF A PROPHETIC 1954 TALK

I should like to recall this fact: Mr. President, on February 18, 1954, I reproduced, in the Appendix of the Congressional Record, a most interesting address. It was entitled "Wings or Caves."

Its theme was that man could usher in a new golden age of aviation and progress, or he might be forced back into the caves.

Prominent in that address, which had been delivered before the Women's Forum on National Security by Mr. Samuel F. Pryor, Jr., was a prediction, on February 18, 1954, that there might some day be an earth satellite.

This was 3½ years before the October 1957 Soviet sputnik.

MY REASONS FOR RAISING THIS MATTER

Let me emphasize that the purpose for which I refer to this subject today is severalfold.

(a) In the first place, the 1954 speech demonstrated foresight. That is what this country needs—vision. Without vision, a people perish, the Good Book tells us.

That, too, is what many sound newspapers editorialized on when they rightly praised the Wings or Caves speech.

But, what has not been pointed out by the press was that, in the original speech, reference had been made to weather research—German space research for weather control purposes.

Let us not, therefore, overlook this weather possibility, just as for so long we unfortunately overlooked the possibility of an earth satellite.

(b) In the second place, this weather subject is very relevant to East-West scientific cooperation or conflict.

DISARMAMENT PROBLEM AND THE WEAPON OF WEATHER

My learned colleague, the senior Senator from Minnesota, Mr. Humphrey, is giving us the benefit today of his long study of the subject of disarmament. He has worked with his characteristic diligence and dedication on the Senate Subcommittee on Disarmament.

But, I stress now, that the disarmament problem, as he so well knows, is complicated by the fact that whole new weapons, and families of weapons, are being developed. Weather control may be such a weapon in the future; and some day, that weapon may become so comparatively simple, so comparatively easy to use, as almost to defy

inspection and control. I am sure that my alert colleague will be mindful of this fact, just as he bears other elements of the picture in mind.

I send to the desk now two items; the first consists of the New York Times article, to which I referred.

The second consists of a few brief excerpts from the speech as delivered originally on January 30, 1954, and as published in the Record of February 18, 1954, beginning on page A1327. I ask unanimous consent that both items be printed, as reprinted, at this point in the Record.

There being no objection, the items referred to were ordered to be printed in the Record, as follows:

[From the New York Times of February 2, 1958]

WEATHER BUREAU FAILS IN FUND BID—PLEA FOR EXPANDED RESEARCH REJECTED IN FACE OF MANY WARNINGS BY SCIENTISTS

WASHINGTON, February 1.—The administration has rejected pleas for expanded meteorological research, which the Weather Bureau says could lead to improved forecasting and eventually weather control.

The rejection came in the face of warnings from prominent scientists and a special advisory committee to the President that the country must accelerate research on weather and how it could be modified or controlled.

In the budget for the coming fiscal year, the administration has provided $2,650,100 for the Weather Bureau. This represents only a $45,600 increase over the Bureau's research budget for the current fiscal year. The small rise is more than offset by growing research and personnel costs.

As a result, officials estimate the Bureau will be forced to a declining level of research and will be unable to undertake broad new projects.

SOUGHT BIGGER FUND

While the exact figures are secret, the Bureau was reported to have asked for several million dollars more than what has been allocated. The proposed research budget was trimmed as it passed through the Commerce Department and the Budget Bureau.

Among the proposals rejected was research on such meteorological fundamentals as the cause of tornadoes and the formation of rain.

The Bureau had proposed a multi-million-dollar investigation of tornadoes, one of the most destructive types of storms. Bureau scientists believed that the investigation would lead to better forecasting of storms and perhaps to a method to dissipate them before they started their destructive whirl.

The Bureau also had proposed greatly expanded research on the nature of cloud and rain formation. Surprisingly, after years of predicting rain, it still has no definite answer as to what makes rain.

Its research is being curtailed when meteorological experts believe they have the tools finally to make great advances in understanding and predicting weather.

Dr. Harry Wexler, chief Bureau scientist, observed that with such devices as high-flying planes, earth satellites, and high-speed computers, "we, for the first time, have tools commensurate with the global scale of weather research: we are on the verge of making a great forward step if only we can exploit the tools we have available."

In recent weeks, there have been repeated warnings from scientists that the United States must accelerate meteorological research or face the possibility that the Soviet Union will be the first to achieve weather control.

Dr. Edward Teller of the University of California, the so-called father of the hydrogen bomb, warned the Senate Preparedness Subcommittee in November that the United States could become a second-class power without a shot being fired if the Soviet Union first learned how to control weather on a large scale.

Similarly, Dr. Henry G. Houghton of the Massachusetts Institute of Technology has said that international control of weather modification will be as essential as control over nuclear energy.

The lack of basic scientific knowledge essential for future weather control was stressed by the Advisory Committee on Weather Control in its first report to President Eisenhower December 31. A major recommendation was that the Government back meteorological research more vigorously.

The administration's attitude toward meterological research may be changed by a report expected early next month from a committee of the National Academy of Sciences.

The committee, headed by Dr. Lloyd V. Berkner, was established at the request of the Commerce Department to survey the field of weather research.

It is expected to recommend that the Government substantially increase support of basic research in meteorology, and the steps be taken to increase the now-limited number of meteorological students.

An indication of the committee's thinking is the proposal by Dr. Berkner that a $50 million national meteorological laboratory be established by the Government with an annual operating budget of $15 million.

[Congressional Record, February 4, 1958]

Mr. HUMPHREY. Mr. President, the key to obtaining peace is to bring the people of the world together in cooperation. One of the most imaginative proposals I have heard in many months is that advanced by our majority leader: a joint venture in the exploration of outer space.

The distinguished correspondent of the Washington Post, Robert C. Albright, covered the proposal very well this morning. I ask unanimous consent that his article be printed in the Record as a part of my remarks.

There being no objections, the article was ordered to be printed in the Record, as follows:

[From the Washington Post of February 4, 1958]

U. N. URGED TO LEAD IN SPACE EXPLORATION

(By Robert C. Albright)

Senate Majority Leader Lyndon B. Johnson, Democrat of Texas, yesterday called on President Eisenhower to press immediately in the United Nations for exploration of outer space by U. N. member nations as a joint undertaking.

Johnson told the Senate the United States has a golden opportunity at this moment, in the wake of the successful launching of the satellite, Explorer, to take the initiative in world councils.

He said: "This is the time to act—now, while the satellites are searching for facts, instead of for targets."

Johnson's speech was one of a series of Senate talks inspired by the satellite launching.

While Johnson prodded for action by the U. N., another speaker, Senator Joseph S. Clark, Democrat of Pennsylvania, warned against any United States relapse into complacency.

Clark said this is no time to knock ourselves silly in self-congratulation. He said the Soviet sputniks woke up Rip Van Winkle. * * * I hope the Explorer does not put him back to sleep.

The Democratic leadership call for the United States to seize the initiative in the U. N. coincided with yesterday's opening of a sweeping review of foreign policy by the Senate Foreign Relations Committee, believed aimed at a similar goal.

TWINING ISSUES WARNING

The foreign policy review, which will continue into late spring, opened in executive session with Maj. Gen. Nathan F. Twining, Chairman of the Joint Chiefs of Staff, on the witness stand. Twining testified that as of today the free world is strong enough to devastate Communist territory and win any war forced upon us. His detailed analysis of United States strength in relation to Russia's was kept secret, however.

Johnson's Senate speech, favorably received on both sides of the aisle, meanwhile pushed ahead with the Texan's proposal of January 14 that the United States demonstrate its initiative before the United Nations by inviting all member nations to join together in the outer space adventure.

"I would hope that this proposition could be pressed earnestly, vigorously, and with all the sincerity at our command," Johnson told the Senate yesterday. He added:

"No one would stand to lose by this proposal. The alternative is a disorderly arms race which can end only in death and destruction.

"For the moment, our prestige is at a high point. There is no better time for a display of the generosity, the initiative, and the constructive desire for peace which lie in the soul of the American people."

The Texan said that if the present race continues this will become "the world of the manic depressive—high points of elation when we make an important advance; low points of despair when they outstrip us.

"And at some interval when we are at a low point and they are at a high point, somebody is going to press the button."

The Texan told the Senate that General Assembly President Sir Leslie Munro of New Zealand already has proposed a U. N. conference on scientists and diplomats in the near future to study control of outer space.

Munro was quoted in a United Press dispatch, January 31, as saying however, that despite many references by President Eisenhower and others to the need for space control, there has been no initiative, except in embryo, to bring the issue to the U. N.

Senator Leverett Saltonstall, Republican, of Massachusetts, chairman of the Senate's Republican Party Conference, replied that he gathered Johnson wanted the administration to "take every possible step to try to see that the satellite race does not end in a more critical military controversy, but will lead to a greater opportunity for attaining world peace."

Saltonstall added:

"Whether such leadership is exercised through the U. N. or otherwise, I assume that the Senator from Texas desires that we take the lead; and we all concur in that desire."

Johnson said that was correct but stressed again:

"I think the leadership might very appropriately come from the United Nations, and I have so suggested."

Senator Estes Kefauver, Democrat, of Tennessee, praised Johnson's proposal as a move that could "win for us the esteem of all the peoples of the free world, and perhaps even of the plain people behind the Iron Curtain as well."

Kefauver said he hoped it would be pushed by the President and the American representative at the United Nations.

OTHER DEVELOPMENTS

In these other developments:

Senator Richard Neuberger, Democrat, of Oregon, urged the Army to revoke its court-martial conviction of Col. John C. Nickerson, who was shifted to a sewer inspection job in Panama for breach of rules in his advocacy of the Jupiter-C missile, which has since launched the satellite.

Senate Democratic Whip Mike Mansfield, of Montana, praised Nickerson as well as Lt. Gen. James M. Gavin, retiring from the Army March 31, in protest against what he termed the Army's rapidly deteriorating position. Mansfield said the Army's satellite success should help restore its rightful place in the sun.

House Republican Whip Leslie C. Arends, Republican, of Indiana, said he hoped the Explorer would put an end to any effort to make political capital out of defense and quiet what he termed the hysteria displayed by some people.

Senator Ralph W. Yarborough, Democrat, of Texas, announced he will propose a special "space act" to make the fullest possible use of data obtained from the scientific satellites. His bill would authorize the National Science Foundation to set up and operate the program.

Senator Hubert H. Humphrey, Democrat, of Minnesota, said he will make a major speech on United States foreign policy and disarmament in the Senate today.

Mr. HUMPHREY. Mr. President, the profession of journalism is more than the mere collecting and reporting of facts. In its highest sense, it is a question of putting facts in their true perspective so our people can be fully informed when they make their decisions.

Americans are extremely fortunate and can rejoice in the press corps that covers Washington. On the whole, the news coverage out of this city is the finest of any capital in the world.

On Sunday, there was an unusually good example of the kind of reporting that reflects the Washington press corps standards. It was an article by the Capitol correspondent for the Washington Post, Robert C. Albright.

Through careful research, Mr. Albright put together facts, traced their relationship and emerged with a coherent picture—the picture of this session as one which must pave the road toward peace if peace is to come in our time.

[From the Washington Post of February 2, 1958]

JOHNSON DRIVING FOR "PEACE BEYOND SPUTNIKS"

(By Robert C. Albright)

Behind the Senate investigation of United States missile preparedness is a far more significant though largely unpublicized Democratic effort to hammer out a realistic United States program for peace.

It can now be stated that the overall aim of the Democratic leadership is not just to catch up with Soviet Russia, however absorbing that quest may be for the present. The paramount goal of top Democrats is to seek out and, in cooperation with the executive branch, help develop foreign policies that will bring peace in our time.

If these leaders have their way, this will not go down as the "Sputnik Congress" but as the Congress which made tangible progress toward peace.

This has been the dominant objective of leading Democrats for a long time—in fact, ever since it became obvious that to overtake Russia in rockets, desirable as that immediate goal was and still is, can only result in stalemate and a stretchout of the arms race. The country and the world would demand something better, and these leaders proposed to give it to them.

PUBLIC GETTING SATED

Senate Majority Leader Lyndon B. Johnson, Democrat, of Texas, is the daddy of this new Democratic strategy, which really isn't new and possibly isn't strategy in the strictly political concept.

It has been there right along, lying just under the surface of the dramatic congressional drive to plug up the missile gap.

There have been some hints that the public may be beginning to pall of the daily diet of missiles and frenzied satellite efforts. Some say the people are also very weary of being told thrice daily the depressing tale of how the Soviet Union outfoxed Uncle Sam.

Anticipating just such a surfeit, this Democratic Congress wants to have something more than missiles and sputniks to offer the American people when they ask the inevitable question: "What are you doing about it?"

Congress hopes to have liberalized programs of education and housing. It hopes to have farm, small-business and natural resource proposals bearing a distinctive Democratic label. And it hopes to do something tangible about sagging business and the Nation's 4½ million unemployed.

THE PARTISANS OUTVOTED

The specifics of all of those programs are still on the drawing board. But in the broader field of international relations, this Congress already has its answer ready. The fact is, with any kind of luck, Congress will muscle right in on the Eisenhower administration's 5-year monopoly of the big "P" in "Peace."

Key to the new strategy is the strictly nonpartisan posture taken by Johnson at the start of the present session. Democratic partisans didn't like it, but Johnson flatly refused to step over the line.

To all who chose to make it a party matter, Johnson argued that only through affirmative action by the President himself can the missiles gap be closed. Similarly, he suggested that Congress can make important contributions to foreign policy but that only the President can execute them.

First fruits of the Democratic leadership tactic, if tactic it is, were impressive. Forsaking party lines, the full membership of the Preparedness Subcommittee (4 Democrats and 3 Republicans) called on the administration January 23 to take decisive action on 17 major defense programs.

MINDS THEIR TARGET

Although it received second billing to missiles in the headlines, the overall peace objective was stated ringingly in the initial bipartisan declaration of the investigating group.

"We are engaged in a race for survival and we intend to win that race," said the statement. "But the truly worthwhile goal is a world of peace—the only world in which there will also be security.

"The immediate objective is to defend ourselves. But the equally important objective is to reach the hearts and minds of men everywhere so the day will come when the ballistic missile will be merely a dusty relic in the museums of mankind and men everywhere will work together in understanding."

Hardly was the ink dry on this statement before the Senate Foreign Relations Committee picked up the bipartisan ball to take another far-reaching action. By the same unanimity that distinguished the missile investigation, the foreign relations group approved the most comprehensive review of foreign policy undertaken in recent years.

In effect, this blue-ribbon unit was exerting a foreign policy leadership never before assumed on the Hill during President Eisenhower's incumbency. Like the missile investigators, it was doing this by the joint action of Democrats and Republicans alike.

A Foreign Relations Subcommittee headed by Senator J. William Fulbright, Democrat of Arkansas, with obvious restraint spelled out the purpose of the sweeping inquiry. After weeks of hearings, the committee was to make "such recommendations as may be found appropriate to enable the United States Government to strengthen or alter its policies to the end that they most effectively serve the national interest."

In a word, here was another instrument in the quest by this Democratic-led Congress for the kind of policies that could lead the world to peace.

Actually, the pattern of the Democratic offensive for peace as well as missiles was established by Johnson in his session-opening speech to the Senate Democratic caucus January 7. This speech, which later became popularly known as the Democratic State of the Union Message, warned bluntly that control of space means control of the world.

Space preparedness highlights received the biggest news play, but Johnson was plugging even then for the conference table. He termed it more important now than it ever has been. He said that goals now within reach of the human race are too great to be divided as spoils, too great to waste in a blind race between competitive nations.

"Total security perhaps is possible now for the first time in man's history," he told his Democratic colleagues. "Total security—and, with it, total peace."

This Johnson theme was to repeat itself in a variety of forms again and again during the first 4 weeks of the Congress, culminating in a concrete proposal for a penetration of international differences.

Addressing a meeting of CBS affiliates in Washington January 14, Johnson urged that the United States demonstrate its initiative before the United Nations by inviting all member nations to join in this adventure into outer space together.

"The dimensions of space dwarf our national differences on earth," he said. "If we are to win space as the outpost of peace, all men may—and should—share in that endeavor."

Here, in effect, was a bid for the smallest, along with the biggest U. N. member nations to join the United States and Russia in control of space. It would appear on its face to have universal appeal.

President Eisenhower, in a letter to Soviet Premier Bulganin, January 12, had proposed to dedicate outer space to the peaceful uses of mankind. Johnson was proposing a specific way to do it.

Two days later he got a nibble from Secretary Dulles. Speaking to the National Press Club, Dulles said:

"It is unhappily too late now to assure fully what the United States proposed in 1947—that all fissionable material should be used only for peaceful purposes—although we still can, and should, do that for newly produced fissionable material.

"But it is possible now to assure that outer space—all of it—should be dedicated to peace and not to war, I might add that we have been much interested in the suggestions made by Senator Lyndon Johnson in this field."

If picked up and pushed by the administration, this wouldn't be the first time that an idea advanced by the Senate Democratic leader had been incorporated in United States foreign policy.

Following the controversial 1957 CBS broadcast featuring a Face the Nation interview with Soviet boss Khrushchev, Johnson bucked a critical pattern of administration comment to propose more of such broadcasts by Russian leaders. He made one condition: That they grant us equal opportunities for reaching the Russian people.

In a major speech to the Senate last June, Johnson proposed other such exchanges. Why not let American and Soviet farmers, labor leaders, industrial managers, scholars, and professional men visit each other's countries and exchange views in the plain sight of the whole world?

Last Monday, just 7 months after the Johnson proposal, the United States and Russia signed a historic exchange-of-persons agreement. It contemplates visits to this country by some 500 Soviet scientists, students, sportsmen, and artists in each of the next 2 years, with comparable American groups going to Russia. It also provides for an exchange of broadcasts, each over the other's radio, on international political problems.

The day after the agreement was announced, a Republican Senator, Jacob K. Javits, of New York, arose in the Senate to give Johnson due credit. He said that Johnson originally had suggested such broadcast exchanges, and "I think he is entitled to hear our thanks for what he did."

Earlier, Johnson himself had welcomed the signing of the exchange agreement as an essential first step—the beginning of a beginning—on the long road to peace.

He made a little speech, which somehow missed the news trunk wires, spelling out the hopes now aborning in this Democratic Congress for making that permanent contribution to peace.

"I try to be a realist about such things," Johnson said. "I have little faith in outlawing war as an instrument of national policy merely through pacts of renunciation.

"I do, however, have a great deal of faith in efforts to outlaw war when they are accompanied by positive steps to bring people together in cooperation."

Then he nailed down his point:

"When people work together to face a great challenge, they tend to lose their suspicion of each other. They become absorbed in the task before them—and fighting as an instrument of policy fades from the picture.

"It is for this reason that I believe the current situation affords us such a great opportunity. There are positive steps which we can take in concert with the other nations of the world to face the great challenge presented by outer space.

"These steps cannot be taken overnight. They will require long and careful preparation. And part of that preparation must be to bring the people of the world to a point where they can at least talk to each other."

[Congressional Record, February 5, 1958]

SPECIAL SENATE COMMITTEE TO CONSIDER THE POLICY PROBLEMS OF OUR APPROACH TO OUTER SPACE

Mr. JOHNSON of Texas. Mr. President, I wish to speak on a matter of deep, personal concern to myself and, I am sure, to every other Member of the Senate.

It is apparent that our country is stepping into a totally new stage of history. Events are crowding upon us thick and fast; and it is urgent that we lay our basic plans now, while there is still time for reflection.

The exploration of outer space has moved from the laboratory to the workshop, and there are far-reaching implications which we must understand.

The President of the United States has instructed his scientific advisers to look into the question of an agency to handle space projects. We can expect recommendations, I hope, during this session.

As a temporary expedient, it has been proposed that the Secretary of Defense be given control of space projects for 1 year. But we know that this does not settle the basic policy questions.

Thus far, there is little that we know about outer space—except that it is about to dominate the affairs of mankind. Our techniques are in their infancy; our knowledge is meager; and our space tools are limited.

But we have reached the point where broad policy problems are being raised. They are problems which must be settled now, lest they become stumbling blocks to progress.

There are arguments that outer space should become the province of the military, simply because our space implements so far have grown out of the search for weapons.

There are arguments that we should have a separate civilian agency, because we wish to bring mankind together in the use of outer space for peaceful purposes.

There are arguments that we must find a form of organization which permits us to pursue peace in outer space, while maintaining our defense potential, if peace cannot be found.

Only one thing is clear: We are entering into an age in which conventional responses to unconventional problems will not be adequate.

A little more than a decade ago, we encountered essentially the same problem, in the development of atomic energy. The basic research had been done by independent scientists. The practical work had been done by the military.

The Nation was then faced with the problem of what should be done with a new, and unconventional, source of energy.

It was not possible to point to any single congressional committee, and to say: "This is your field." The jurisdiction obviously cuts across that of many standing committees.

It was decided to set up a special Senate study committee, drawing from four committees for its membership. The decision was wise. It culminated in the Atomic Energy Act.

We are faced, again, with a problem that cuts across the jurisdiction of many committees, and it is a problem that must be solved.

Accordingly, on behalf of the Senate Preparedness Subcommittee—the senior Senator from New Hampshire [Mr. Bridges], the senior Senator from Massachusetts [Mr. Saltonstall], the Senator from Vermont [Mr. Flanders], the Senator from Tennessee [Mr. Kefauver], the Senator from Mississippi [Mr. Stennis], and the Senator from Missouri [Mr. Symington]—I am submitting at this time a Senate resolution for the appointment of a special Senate committee to consider the policy problems presented in our approach to outer space.

The members of the special committee would be appointed by the Vice President, and would be drawn from the Armed Services Committee, the Foreign Relations Committee, the Appropriations Committee, the Interstate Commerce Committee, the Government Operations Committee, and the Joint Committee on Atomic Energy.

This is intended to be merely a temporary study committee to make recommendations at this session of Congress. But it would be empowered to receive—as a legislative committee—any recommendations that came to us from the President.

Our Nation, according to all the evidence, suffers from no lag in brainpower available for the problems immediately before us. We can suffer, however, if we do not establish a national policy to mobilize that brainpower in order to pioneer the new dimension.

The task is far too big to be left to scattered efforts. Somewhere there must be lodged specific responsibility for America's effort in outer space.

We can achieve a consistant policy only through cooperation. The Executive is moving to make recommendations, and we should move to be ready to give them early consideration.

I believe this is a matter of the first importance. I hope the resolution will receive early action by the Rules Committee; and I send the resolution to the desk for appropriate reference.

The VICE PRESIDENT. The resolution will be received and appropriately referred.

The resolution (S. Res. 256), submitted by Mr. Johnson of Texas (for himself, Mr. Kefauver, Mr. Stennis, Mr. Symington, Mr. Bridges, Mr. Saltonstall, and Mr. Flanders), was referred to the Committee on Rules and Administration. * * *

Mr. KNOWLAND. Mr. President, I believe it is a constructive move on the part of the chairman of the Preparedness Subcommittee and his colleagues on both sides of the table in that committee, when they suggest the establishment of a special committee of the type indicated. Working in cooperation, as part of a common government faced with a problem common to our own Nation and to civilization, I believe the establishment of a special committee of this type, representing several

committees which otherwise might have jurisdiction over proposed legislation in this field, will permit the Senate to coordinate its efforts, as part of the legislative arm of the Government, and before this session has completed its labors, and in working with a common purpose with the executive arm of the Government, to develop legislative proposals in this field, which is of importance and concern to the American people.

Mr. JOHNSON of Texas. Mr. President, I thank the distinguished minority leader for his constructive observation.

PROPOSED SPACE ACT OF 1958

Mr. YARBOROUGH. Mr. President, on behalf of myself, the Senator from Montana [Mr. Mansfield], the Senators from Alabama [Mr. Hill and Mr. Sparkman], the Senator from Colorado [Mr. Carroll], the Senator from Minnesota [Mr. Humphrey], and the Senator from Oregon [Mr. Morse], I introduce, for appropriate reference, a bill entitled "The Space Act of 1958."

This proposed legislation provides for the initiation and support of an inner and outer space study and development program for peaceful uses in commerce and industry of information obtained from rocket ships, satellites, space vehicles, and similar media. The bill recognizes the importance of the use of space travelling objects in systems of communication between different points on the earth, and between the earth and other bodies in space, and provides for study, research, evaluation, and operation of systems of communication based on utilization of manmade objects in space.

The activities provided by this bill are placed under the National Science Foundation, and the bill provides for the creation within the National Science Foundation of the position of Coordinator of Space Information.

Mr. President, the American satellite Explorer is now orbiting the great unknown of outer space, and we are all proud of this scientific advancement. But we are also keenly aware of the fact that all mankind stands at a great crossroads of history.

The potential of the good that may come to all mankind from the exploration and understanding of outer space is so great it defies description. The treasures of knowledge which our space explorers will bring back to the earth from the heavens will be far more valuable than those carried back to Europe by Columbus, or any other explorer of all time. It is expected that the most immediate benefit to mankind will be meteorological information which must lead to improved long-range weather forecasting, weather control, and modification.

The information we gather from the satellite Explorer and other space bodies may help furnish keys to weather control which would assure that one day great areas of our Nation and the world would no longer have droughts and famine; that mankind would be able to prevent, or be amply warned of, hurricanes, tidal waves, and other severe weather. These are things which seem far off, yet competent scientists report they are within the realm of the attainable, with this vast new knowledge of outer space. And the weather picture is only one field of those to be developed. Information to be gained from

Explorer and other satellites will prove invaluable in our understanding of communications, and most fundamental problems of science, including physics, geophysics, astrophysics, and astronomy. In short, with a satellite in outer space, we are at the threshold of a great revolution in our knowledge of communication, weather control, and scientific phenomena, and this in time will likely produce great changes in our way of life as we know it today.

In the face of such momentous developments, it is imperative that this information be used for the benefit and not the detriment of mankind. America's satellite in the heavens is sending information from the skies, and we need a program for the study and beneficial utilization of that information.

These satellites can be used for war or peace. While military agencies consider their military value, I believe we should begin to develop them as instruments of peace, as the ultimate destiny of the human race must surely lead to that goal.

Mr. President, I ask unanimous consent that the bill be printed in full at this point in the Record, and that it may lie on the table until the close of the session of the Senate this coming Friday, to give an opportunity to any other Senators who may wish to do so to join in sponsoring it.

The VICE PRESIDENT. The bill will be received and appropriately referred; and, without objection, the bill will be printed in the Record, and lie on the desk, as requested by the Senator from Texas.

The bill (S. 3233) to provide for the initiation and support of an inner and outer space study, research, and development program for peaceful uses in commerce and industry which shall include, but shall not be limited to, the assimilation, gathering, correlation, and dispersal of information and knowledge relating to, among other fields, weather and communications obtained from rocket ships, satellites, space vehicles, and other such media, introduced by Mr. YARBOROUGH (for himself and other Senators), was received, read twice by its title, referred to the Committee on Interstate and Foreign Commerce. (See the section on Bills and Resolutions in this report.)

MISSILES, SPACE, AND SURVIVAL

Extension of remarks of Hon. Thos. E. Martin, of Iowa, in the Senate of the United States, Wednesday, February 5, 1958

Mr. MARTIN of Iowa. Mr. President, the American people have shown great concern that Russia succeeded in launching a missile into outer space before the United States. We all realize that our scientific efforts must be increased. On the other hand, there is no excuse for partisan criticism of the Defense Department. Its efforts have been directed toward the development of an operational system of missiles for military use. The satellite project was one of the activities we undertook in connection with the International Geophysical Year. It was not a part of our defense program.

The success we have achieved in orbiting the Explorer should remove the ill-founded and partisan criticism of our scientific capabilities.

Most of us are unaware of the organization which has been created to produce ballistic missiles. Security requirements have precluded

an informed public opinion. The veil was lifted on some aspects of this problem when Maj. Gen. Bernard A. Schriever address the Economic Club of New York on January 21, 1958. General Schriever is the commander of the Air Force Ballistic Missile Division, Air Research and Development Command.

MISSILES, SPACE, AND SURVIVAL

(Speech delivered before the Economic Club of New York, Grand Ballroom, Sheraton-Astor Hotel, New York City, Tuesday evening, January 21, 1951, by Maj. Gen. Bernard A. Schriever, commander, Air Force Ballistic Missile Division, Air Research and Development Command)

The question uppermost in all our minds is what more can we do to regain the advantage and lead which, in some areas, we have lost temporarily to the Soviet Union?

Naturally, this is not only a military question. It is also inseparable from political, economic, and psychological questions of the highest order and urgency.

As we face all these challenges in the cold war, I am confident that, in the still new year of 1958, we will witness an ever-growing awareness that survival is everybody's business.

Many of us, from all walks of our national life, are trying to contribute whatever we can to a better public understanding of the challenge and demands of the missile and space age.

That is why I am here tonight.

That is why I welcome this opportunity to report to you on our Air Force ballistic missile program—its status today, its prospects for tomorrow, and its implication for the day after tomorrow.

I wish only that my work schedule allowed me to appear more frequently before organizations such as your Economic Club and similar groups around the country. I say this because in our democracy the public's right to know, to know the facts, and to know what the facts mean, is something that has to be continuously safeguarded—always, of course, within the limits of security.

I say this for still another reason. It seems to me that individuals, like yourselves, who perform leadership roles in finance, industry, commerce, in the professions and in civic and community affairs, now have two new responsibilities added to all the others which you carry as a part of your leadership function.

The first responsibility is to concern and inform yourselves as fully as possible about the imperatives of national security; and the second is to encourage others to become similarly concerned and informed by means of your own precept and example.

For the success of our whole national defense effort can be assured only when our people define and support its objectives, and the measures taken to reach them.

With this definition and support, we will be able to overcome—sooner than some think—the dangers resulting from recent Soviet advances in the fields of missiles and space technology.

In this respect, we face a twofold job in our Air Force ballistic missile program, which as you know includes the ICBM's Atlas, and Titan and the intermediate-range ballistic missile, the Thor.

In the period immediately ahead, we must further compress the time required to achieve operational capability of both our intermediate and our intercontinental ballistic missiles. We must get them faster—and we can. We must get them in sufficient number to close whatever gap may exist between our country and the Soviet Union in the operational availability of such weapons systems.

Within the overall framework of our national defense policy, the AFBM program has been assigned top priority since September 1955. The reason for this top priority rating reflects perfectly the purpose of our program. That purpose is to strengthen our own deterrent power, and that of other free peoples, by helping to keep the Soviets convinced that it would be suicidal for them to precipitate world war III. In one sense, therefore, our ballistic missile program is a paradoxical enterprise. Never before has so large a proportion of our national resources been invested in an instrumentality that, we hope, we shall never be compelled to use. The underlying aim, then, of our ballistic missile program is to provide us with another shield, against the aggressions of Communist imperialism—a shield behind which we can intensify and expand our efforts to build conditions of peace by political, economic, and psychological means.

On this score, we should remember that deterrent power—like all forms of military power—is in a state of constant flux and transition. There is no fixed, final, and frozen solution to the problem of deterrent power, or of military power, or of national defense, any more than there is an ultimate weapon.

At the moment, for example, we have in being the tangible and tremendous deterrent power of the Strategic Air Command's manned aircraft. Yet these present aircraft within a few years will be superseded by our forthcoming B-58's and by the WS-110A with designed speed of 2,000 miles per hour, and a chemically fueled bomber. The planes of our Strategic Air Command must continue to embody the latest advances and to be maintained at peak efficiency in both equipment and personnel. In this day of our preoccupation with missiles, it is often all too easy to underestimate the military might represented by the Strategic Air Command and this striking force of long-range bombers. We all realize that many of the missions of the manned aircraft will eventually be taken over by missiles—some of them in the next few years and others in the more distant future. Yet if we sought to arrest or to halt the constant modernization of SAC aircraft, we would only undermine our national security. Before we remotely dream of writing off our SAC manned aircraft, let me remind you that these planes carrying both atomic and thermonuclear explosives, not only in the form of bombs but in the form of air-to-ground missiles, could inflict virtual annihilation upon even so vast a country as the Soviet Union.

Therefore, any transition from SAC bombers to ballistic missiles must come about in an orderly, step-by-step fashion—lest at a decisive moment we weaken our defense posture and invite disaster. In short, as we move to bring our ballistic missiles toward operational capability, we cannot for a moment relax our efforts

to sustain our SAC manned forces in being, in a state of constant readiness, constant improvement, constant dispersal.

By the same token, we must look beyond the achievement of parity and/or superiority vis-a-vis the Soviet Union in the field of ballistic missiles of the first generation.

We will have to keep refining and improving our first comparatively primitive ballistic missiles, which are now, in effect, Model T versions. We will have to produce them at less cost. We will have to make them more accurate, more reliable, less complicated. We are now making these decisions to attain these results—and at the same time, we must make further decisions to design, develop, and produce this next generation of missiles.

On the clock of national security, we must be able to tell time not just by the minute hand, but also by the hour hand. This means long-term planning. This means that 1968 has to be as real in our thinking as 1958 or 1959 or 1960.

Quite as importantly, we must consider now, and consider seriously, the science and technology involved in the conquest of space.

The old geopolitics of earth may have to be supplemented by the new geophysics of space.

This is the new central fact of our age. It cannot be dismissed as Buck Rogers fantasy. The whole realm of space science and technology is the new arena in which we must mobilize vigorously and successfully not only to equal; but also to surpass, gains already scored by the Soviet Union.

It is against the background of these immediate and long-term considerations in the related areas of missiles and space technology that I should like to outline to you some of the highlights of our AFBM program.

Many of you are familiar with the fact that when we first got under way on an accelerated program nearly 4 years ago, we had to press against the frontiers of territory previously unexplored. Many of you know about some of the spectacular achievements which have been made in the science and technology of the ballistic missiles, whether in propulsion or in reentry of the nose cone, or in inertial guidance and the like. I wonder, however, how many of you are as familiar with still another important advance which has been perhaps unduly overlooked.

I refer to the management concept which pervades the AFBM program. This concept, which we call the concept of concurrency, is unique in the management of any undertaking. It represents an invention that may prove to be of quite as much importance as the physical inventions represented by new devices, machinery, and apparatus for the ballistic missile itself.

We assumed from the outset that our program would have to be—as it has in fact become—the single greatest venture ever attempted in the building of a weapon system; our overriding objective being to achieve an operational capability at the earliest possible date.

The scope, complexity, and unknown character of the problems confronting us caused us to adopt a new approach to the mobilization of money, manpower, and machines.

In money, for example, our program has, for the past 2 years, involved over a billion dollars a year. It will require more in the future. This has been no small problem in financial management alone—especially since we have been determined to make every taxpayer's dollar count.

In manpower, our program has called upon 18,000 scientists, engineers, and other technical experts in the university and in industry. Directly and actively participating in our program—from front office to factory floor—are another 70,000 people in 22 industries, represented by 17 prime contractors, 200 subcontractors, and more than 200,000 suppliers. Our program, in addition, has entailed the recruitment of a substantial slice of talent in military management—about 500 officers chosen for technical competence and for their healthy disrespect for redtape.

From the earliest days, we saw that our assignment would demand a new kind of specialized planning to coordinate the myriad elements involved in our program.

Also, we were well aware that it had been taking too long to bring new weapons into operational use. Such a situation was ridiculous in the greatest industrial Nation in the world. We felt one of the basic contributing reasons was organization and management so we decided to break with tradition—to discard the usual procedure; which is to build a new weapon, in a series of consecutive steps—to fashion handwrought prototypes before venturing into production tooling. To reduce the time cycle from theory to reality, we decided to attack all areas of our assignment, concurrently building a production base and starting in the operational areas of training and base construction.

In short, we took the calculated risk of planning, programing, and spending our funds, concurrently, on research, development, testing, production, manpower training, base construction, and other phases of our program, all of which are parts of a continuous and concurrent flow process in which all elements act, interact, and react with each other, with constant feedbacks from each element of the cycle to all other elements.

All of you are, of course, familiar with the development testing that is going on in Florida. We couldn't hide it even if we wanted to; the tests are quite spectacular. Behind the flight test we have a tremendous effort of ground testing from components to complete subsystems such as the entire rocket engine and guidance systems. We even test the complete missile on large static test stands, of which we have many.

At the same time all this was going forward, we were preparing our ground equipment and logistical support structure from the gantry crane at the launching pad to production assembly line—including transportation, maintenance, and repair storage, and supply. Also at the same time, we were constructing facilities for our missile training at Cooke Air Force Base and are getting under way at another base at Cheyenne, Wyo., and are selecting still another.

At the same time, training specialists have written the first missile manuals, and the first batches of missile instructors were getting intensive courses not only in the technique and handling

of the ballistic missile as a weapon system but also in the human psychology involved.

Evidence of the practical value of our altogether and all-at-once management was dramatically provided by the first flight of our Thor missile. Only 11 months after we had received Department of Defense approval to begin our Thor project, the first Thor missile came off the production line.

Furthermore, we have every confidence that by December of 1958, just 36 months after the inception of the Thor project, a completely operational Thor squadron will be ready for overseas deployment.

In brief, we were able to compress time and to collapse schedules more rapidly than had ever been done before in the research, development, and production of any previous complex weapon system.

This achievement typifies the way in which our management of the ballistic-missile program has worked to shorten spectacularly the usual time cycle between initiation and operational availability of a weapon system.

Historically, that time cycle had been 8 years or more for a weapon of such complexity.

I have dwelt at some length on these aspects not only because they have been too often overlooked but also because they are often misunderstood.

However, good management at the operational level only solves part of the problem. A complete solution requires at least two other things, namely, a willingness to take a calculated risk—with dollars and a decision-making process which is both decisive and fast.

Let me say a word about each. First, calculated risk. We are already spending large sums for ICBM operational facilities, and have already spent millions in establishing a ballistic missile production base—all this long before we have completed the development and test cycle. Also those of you who are familiar with the Federal Government budget cycle know that planning, programing, and budgeting considerably precede the actual spending. This means that if we are to have the funds at operating level when we require them, the top echelons of Government must take a calculated risk, at an early date, that our development programs will be successful. This has been done to a large degree in the ballistic missile program. I would like to add if we are to regain and extend our lead in this dynamic age of technology we must be willing to take the same calculated risk in all major development programs. If we do not, it may not be a question of too little, but certainly a question of too late.

Next the decision-making process. Based on our experience there must be clear lines of authority for strong central policy and decision making at all levels. We welcome any streamlining and strengthening in this regard as it relates to the conduct of major weapon system programs.

Looking beyond organization and management and into the space age, I believe that perhaps the most important contribution of the AFBM program will be found in the broad and solid basis

which it has laid for our achievements in astronautics, day after tomorrow. Fortunately, we are well advanced in this direction. The original investment required for preliminary projects in space flight has already been made in our AF ballistic missile program. We now have approximately $500 million in new facilities for the development, testing, and production of ballistic missiles and their first cousins, space vehicles. These facilities were nonexistent just 3 years ago.

Furthermore, the AF has conducted invaluable experiments in space medicine. It has sought to ascertain the behavior of body and mind under conditions of weightlessness, acceleration, monotony, isolation, and gravity pull 40 times that which prevails on the earth. And it has under development the X–15, a plane which will perform very much like a manned satellite, for limited periods.

Our present IRBM and ICBM booster engines possess the propulsion capacity required for important military and scientific space missions over the next 10 years. Let us remember that the Thor, Atlas, and Titan are primarily space vehicles—they travel most of their distance outside the earth's atmosphere in space.

They provide springboards for such follow-on projects as lunar rockets, and manned space flight. In working on the Thor, Atlas, and Titan our science-Government-industry team has acquired many new types of knowledge and capabilities that can be the source of substantial shortcuts to our mastery of astronautics. Indeed, we must draw upon this backlog of experience, this new lore, as well as the hardware of the AFBM program, for virtually every forward step, every advance, we can expect to make in this field in the foreseeable future.

As we look even further into the future, we see the possibilities for advanced chemical propulsion and thermonuclear propulsion and payloads of hundreds of tons.

We must initiate projects of this kind now if we are to achieve leadership in space technology in the 1956–70 period.

In this new space age, the equation for survival reads this way: lead time equals leadership. Fortunately, this lead time for leadership has been already purchased, in large measure, with the funds, the foresight, the facilities, and the faith represented in the ballistic missile program.

If, starting today from scratch, we were to attempt to duplicate these existing assets and capabilities, we would need more than 4 years in time and $5 billion.

Just as these assets and capabilities derive directly from what has been discovered in the science and technology of our ballistic missile effort, so too must our basic concepts of concurrency be applied to the countless challenges of new space vehicles of which ballistic missiles are the forerunners.

By the same token, the achievements and direction of our ballistic missile program suggest the basis upon which we can best safeguard our national security as we face the opportunities and the many indefinite perils of the space age.

THE U. N. IN SPACE

Extension of remarks of Hon. Mike Mansfield, of Montana, in the Senate of the United States, Wednesday, February 5, 1958

Mr. MANSFIELD. Mr. President, I ask unanimous consent to have printed in the Appendix of the Record an editorial entitled "The U. N. in Space," which was published this morning in the Washington Post and Times Herald. The editorial emphasizes the leadership being given by the majority leader, the distinguished senior Senator from Texas [Mr. Johnson], in this particular field. I believe that the parallel the editorial draws between his most recent proposal and the original proposals to establish the Joint Committee on Atomic Energy fits in quite nicely.

[From the Washington Post of February 5, 1958]

THE U. N. IN SPACE

Majority Leader Johnson is surely right in emphasizing again the imperative need for joint exploration of space. The Soviet Union has rejected the proposal along this line in Mr. Eisenhower's last letter to Mr. Bulganin except as part of a package arrangement on disarmament. If that rejection were to be considered final, then the outlook would be dismal indeed, for the chances of an early comprehensive agreement on disarment are not bright. But there is at least reason to hope that the pressure of world opinion, plus the effect of the American Explorer in restoring the psychological balance, may persuade the Russians that a joint space effort is in their own interest. There can be no iron curtains in the sky.

Space control is of course related to disarmament, but there are also other and broader aspects. The virtue of a joint undertaking at the outset is that it would start in a fresh area in which no one has a permanent lead, and that cooperation here would be a powerful inducement for cooperation on more vexatious arms-control problems.

If there is to be a joint space effort, however, the groundwork must be laid quickly. As Senator Johnson observes, "This is the time to act—now, while the satellites are still searching for facts instead of for targets." Mr. Johnson urges that the joint effort be undertaken by the United Nations. The President of the General Assembly, New Zealand Ambassador Sir Leslie Knox Munro, has suggested in this vein that a U. N. conference of scientists be called within 2 or 3 months to study control of outer space.

We think that the effort ought to go further than that. Certainly there should be a meeting, or meetings, of scientists; but there also ought to be a meeting of the General Assembly, specially called if necessary, to set the stage for a joint undertaking and control arrangements under the auspices of the U. N. The problem is not brandnew. It has been current at least since the first sputnik last October, and there was talk of it for many months before that. There has been time to develop at least general ideas of what would be feasible. The United States, now that its own first entry into space is in orbit, could

well take the lead in devising a specific proposal for discussion and requesting a special meeting of the Assembly.

Precisely because the problem is complex, it is important to get started soon on the evolution of a U. N. program, whether or not the Russians agree. This may be the way, indeed, to prompt them to join. Despite the disdain for the U. N. implicit in Mr. Bulganin's new letter, the Russians have shown themselves to be sensitive to world opinion.

There is a parallel in the experience with the International Atomic Energy Agency. When President Eisenhower first proposed the atoms-for-peace program in 1953, the Russians were unenthusiastic; but as the plans and organization took shape as the result of international discussion, they concluded that membership would serve their interest. Perhaps a U. N. program for space exploration and control would work in the same way; certainly the need is vital enough to warrant a try.

[Congressional Record, February 6, 1958]

ESTABLISHMENT OF SPECIAL COMMITTEE ON ASTRONAUTICAL AND SPACE EXPLORATION

Mr. JOHNSON of Texas. Mr. President, I move that the Senate proceed to the consideration of Calendar No. 1297, Senate Resolution 256.

The motion was agreed to; and the Senate proceeded to consider the resolution S. 256) establishing a Special Committee on Astronautical and Space Exploration, which had been reported from the Committee on Rules and Administration with an amendment, on page 2, line 1, after the word "thereafter", to insert "but not later than January 31, 1958", so as to make the resolution read: (See the section of this report on Bills and Resolutions.)

Mr. JOHNSON of Texas. Mr. President, I have asked for the immediate consideration of Senate Resolution 256, a resolution to establish a special committee for the consideration of a national policy toward the age of space.

As a nation, we are presented with an unusual opportunity. We have some time to lay plans for the best approach to a revolutionary new age which is advancing rapidly upon us, but which is not yet here.

At the present moment, we are in a transition stage. We have a few fingers probing the area that lies beyond the earth's atmosphere. But our knowledge is still very slight.

We can be certain only of the fact that science advances at an ever-increasing rate of speed, and that the physical presence of men in outer space is only a matter of time.

We have been pushed into outer space by a combination of two forces—the curiosity of scientists and the drive for new weapons. But it is apparent to thoughtful men that there is much more before us than scientific tomes and military hardware.

The exploration of outer space will dominate the affairs of mankind, just as the exploration of the Western Hemisphere dominated the affairs of mankind in the 16th and 17th centuries.

This resolution has been presented on behalf of the entire membership of the Senate Preparedness Subcommittee. It is a natural outgrowth of the hearings, which we have concluded, on the Nation's satellite and ballistic missiles program.

In the course of those hearings, it quickly became apparent that we were being led into fields beyond our proper jurisdiction. It also became apparent that there could be no real answers to the Nation's security problems unless those fields were explored.

The ballistic missile is merely the rear guard of the age in which earth-bound men throw weapons at each other. The satellite is merely the advance guard of the space age.

They cannot be considered adequately unless they are put into the context of America's national policy.

Mr. President, we must have the views of men skilled in our foreign policy. We must have the views of men skilled in military policy. We must have the views of men skilled in commercial policy. We must have the views of men skilled in the new sources of atomic power. And all of these views must be tied into the structure of our present Government and our present society.

This need is apparent already. It is reflected in views which have been advanced by thoughtful men and in bills which have been introduced in this Congress.

The resolution before the Senate does not seek to advance any of those views, to reject any of those views, or to supplant any of those views. It is simply an effort to provide an adequate forum where they can be considered fairly, prudently, and adequately, in the Nation's interest, without regard to parties.

It is my hope that during this session we can resolve some of the basic issues. To resolve those issues, however, we must have a committee with sufficient jurisdiction to consider the proposals together and to weigh their merits.

Bills on this subject have been introduced already. The President has indicated his intention to send Congress his recommendations. We must be ready to consider them promptly, if we are to discharge our obligations.

For the time being, our efforts to explore outer space can remain where they are—in the Defense Department. But I believe all of us are aware that this is not a policy, but is merely an expediency while we determine a policy.

I have no hard and firm conclusions as to the policy that should be adopted. But I do know there is an urgent need to lodge specific responsibility somewhere, and that the decision must be faced up to, and should not be postponed.

Mr. President, I ask unanimous consent to have printed at the conclusion of my remarks on the joint resolution a very excellent editorial entitled "Responsibility for Space," published in the Washington Daily News of today.

RESPONSIBILITY FOR SPACE

Nothing could be worse for the United States than a prolonged cat-and-dog fight over who is to run the American space program. We are far behind in this field. We have no well-defined

program—not even a decision yet on how and by whom such a program will be created.

The pulling and hauling for control has started—among the three branches of the armed services and agencies of Government, among the committees of Congress, between the advocates of military and civilian control. This should stop, pending a Presidential recommendation on how to proceed.

Senate Democratic Leader Lyndon Johnson, on behalf of Democrats and Republicans on his Preparedness Committee, took the first step to this end. He proposed creation of a special Senate committee to consider the President's space proposals, when ready, and to help establish a national policy. The Senate Rules Committee unanimously approved, and the Senate should follow through quickly.

"The task is far too big to be left to scattered efforts," Mr. Johnson said. "Somewhere there must be lodged specific responsibility for America's effort in outer space."

The moves by the President and Senate should—but probably won't—stop the efforts of many vested interests to carve out for themselves a space empire.

This controversy over a space program—when we get one—is another indication of failure to cope with first things first. Only a few of our officials and legislators seem to realize that the real answers to today's problems are complex and difficult—not just appropriation of billions and grabbing blindly for jurisdiction in a new field.

The top problem that confronts us in space is how, whatever we do, our efforts are going to be organized and directed. A wrong or timid decision on how to proceed could be disastrous.

Our failure to keep abreast of the Soviets in space comes not from lack of money, lack of ability, or lack of resources. Allen W. Dulles, Director of the Central Intelligence Agency, put his finger on the causes when he said:

"Achievements (such as Soviet sputniks) depend on the goals and priorities set, the promptness and correctness of the decisions reached, and the energy applied in terms of man-hours with the proper tools and equipment."

So far, in space projects, our goals and priorities have been too low, our decisions have been bad and too late, and too much of our energy has been diverted to areas unimportant for survival.

The VICE PRESIDENT. The question is on agreeing to the committee amendment.

The amendment was agreed to.

Mr. KNOWLAND. Mr. President, I support the resolution. As I mentioned when it was submitted, I think it is a constructive approach to the problem confronting us. The resolution comes to the Senate with the approval of a bipartisan group of the Preparedness Investigating Subcommittee and under their sponsorship. Its purpose is to prevent needless duplication of effort, and perhaps even jurisdictional controversies which might arise among the several standing committees of the Senate, which otherwise might properly handle legislation dealing with this very important subject matter.

It is a resolution which is timely. The special committee will be in being not only to consider proposed legislation which has been or

which may be introduced in this body, and any future proposed legislation which may come to the Senate from the House of Representatives, but also will be able to accept recommendations which may come from the President of the United States during this session, after studies which are underway have been completed by the President and the executive branch of the Government.

Mr. President, for these reasons I shall support the resolution.

Mr. JAVITS. Mr. President, will the Senator yield?

Mr. KNOWLAND. I yield to the Senator from New York.

Mr. JAVITS. I was not present yesterday when the Committee on Rules and Administration acted on the resolution of the Senator from Texas. Throughout the country much has been made of the question whether we in the Congress are looking forward and taking account of the new concepts which our times are thrusting upon us. I think the presentation of this resolution is evidence to the contrary that, under good leadership, Congress wants from every echelon of the Government, from the executive as well as the legislative, constructive advice. I say to the Senator from Texas that many people do not understand that leadership can come from a body like this. I am glad my committee approved the resolution.

I should like to record myself as joining in approval of the resolution. It stamps this body as one which is able, in an epochal stage, of providing the leadership that is required, and demonstrating that we in this body, which is composed of a substantial number of persons, can take events into account and act promptly when the times so require.

* * *

THE INTERIM REPORT OF THE SENATE ARMED SERVICES PREPAREDNESS INVESTIGATING SUBCOMMITTEE

Mr. MANSFIELD. Mr. President, the interim report of the Senate Armed Services Preparedness Investigating Subcommittee issued at the conclusion of its recent series of hearings on this country's satellite and missile programs has been hailed by newspaper editorialists throughout the country.

In the words of an editorial writer for the Wichita Falls, Tex., Daily Times:

> Senator Johnson, personally, and his committee, individually and collectively, have earned the gratitude of fellow Americans for their integrity and their patriotism, their devotion to the task which has been displayed and their able handling of it.

Mr. President, I know the distinguished chairman of the subcommittee has felt particular gratification regarding the commendation voiced by many newspapers in his own State of Texas.

[From the Austin Statesman of January 11, 1958]

JOHNSON'S FIVE POINTS

Senator Lyndon B. Johnson, Senate majority leader and chairman of the Preparedness Subcommittee investigating the progress or lack of it in the missile and satellite fields, has outlined a

five-point program to speed the United States into accomplishments required by the space age.

While Soviet scientific achievements in recent years cannot be underrated, Johnson said they are not depressing. He regards them as a challenge spurring the Nation on to achievement.

With the secret information his committee has adduced from civilian and military chiefs of the Armed Forces some degree of optimism seems well based. His program, which partially parallels proposals made by the President in his addresses to the Nation on science and survival, looks beyond to American leadership in space. Johnson, however, has expressed himself repeatedly as believing the President and his administration still has not reflected a strong sense of urgency.

Johnson's five-point program would:

1. Step up the development of weapons which will insure our survival.

2. Revise our methods of teaching and our curriculum so that science and technology will be given a higher rating.

3. Mobilize our population to face the challenge—tapping the unused reservoirs of talent and ability among those who are retired.

4. Step up research into the physical and biological problems of outer space, perhaps through a space academy.

5. Place specific responsibility for the physical and economic and legal problems of exploring outer space either in a new or existing agency.

The problem will not be met if our only reaction is the construction of weapons. There must be a wide public understanding that the United States has been outstripped in a field in which we thought we were supreme, and by a nation we thought was lagging far behind—that of adequate numbers of engineers, scientists and mathematicians.

[From the Marshall News Messenger of January 28, 1958]

KNOCKING HEADS

Senate Democratic Leader Lyndon Johnson has come to the seemingly practical conclusion that this Nation might get more missiles faster if a few heads were knocked together at the Pentagon than if a new reorganization of the Defense Department is undertaken. The Texan made this observation after his preparedness subcommittee had received testimony on why the United States is trailing the Soviet Union in the development of certain weapons.

Johnson, a practical politician, probably is taking note of opposition to streamlining the United States military such as declared by Representative Carl Vinson, chairman of the House Armed Services Committee. Vinson has made it clear that a military reorganization plan, whether inspired by the Republican administration or the Democratic Senate leadership, will have rough going in the House.

"There is considerable evidence to indicate that organizational forms have been stumbling blocks to achievement (or interservice cooperation)," Johnson said. "On the other hand, it may be that what is needed, is a determined effort to knock some heads together rather than new organizational charts."

With Vinson's House Committee just getting started with its investigation of American defense deficiencies, it would seem that the Johnson "knock heads" suggestion is about the only way the President can get quick action on his State of the Union pledge to remedy whatever is causing the major delays in the Pentagon.

[From the Houston Post of January 25, 1958]

JOHNSON SUBCOMMITTEE REPORT ASKS ACTION TO MEET RED THREAT

The unanimous report of the Senate Preparedness Subcommittee on its investigation of the United States satellite and missile programs is a blueprint for action with which it would be difficult to disagree.

It called for speedy modernization of our defense establishment up and down the line. It lists 17 recommendations designed to achieve this end which were made to the subcommittee during its hearings and said decisive action must be taken on them.

Senator Lyndon B. Johnson, Democrat of Texas, subcommittee chairman, read the report on the Senate floor Thursday. This country, he said, "is entering a new period of history in which the total resources of America must be brought to their greatest development. * * * A full national effort is required and this can be achieved only by people working together."

The report itself was thoroughly nonpartisan. It conceded that things might have been different, if things had been done differently in the past, but it did not look back and it pointed no finger of blame. It talked only of the future and what must be done to preserve American freedom.

Recent technological progress of the Soviet Union, it said, "do not give cause for comfort. But we do not consider them a cause for despair or hopelessness. We regard them as a challenge to all America. There is nothing in the record to indicate that America has lost its vitality or its capacity to produce in time whatever we need to retain our present power to strike devastating blows—blows of almost total destruction—at any aggressor."

The subcommittee investigation, which produced some 7,000 pages of testimony, was a result of the successful Russian launching of the sputniks. Their chief implications, the report said were that they demonstrated the Soviet Union's ability to hurl a missile from one continent to another and they enabled the Soviet Union to gather basic information about outer space.

The report listed various recent actions of the Defense Department to meet the Soviet challenge, but added "they are only a beginning."

The 17 recommendations listed in the report, a number of which tie in with projects already underway, will receive careful, prudent, and thorough study, the report continued. It ended on a lofty, almost poetic, note.

"The immediate objective is to defend ourselves. But the equally important objective is to reach the hearts and minds of men everywhere so that the day will come when the ballistic missile will be merely a dusty relic in the museums of mankind and men everywhere will work together in understanding."

The Preparedness Subcommittee has done the nation a fine service. The objectives it sets forth are well worth the effort needed to achieve them.

[From the Bryan Daily Eagle of Jan. 26, 1958]

STATEMENT ON PREPAREDNESS NOT PRETTY

One of the most important and chilling statements to come out of Washington in a long time is the one just made—by the Senate Preparedness Subcommittee—on our defense position as compared with the Soviet Union.

It is not pretty. It says the Russians are ahead in missiles and submarines; are catching up in airpower, and, at the rate they're going, will forge ahead; can develop new weapons faster; and are producing scientists and engineers at a greater rate.

This statement, presented to the Senate late yesterday, puts the picture in focus. It is as informed, impartial, authoritative, and nonpolitical as such a document can be hoped to be. It's significant for three reasons:

1. The subcommittee drew its conclusions after 101 days of investigation in which it heard 70 witnesses, interviewed over 200 experts, and took more than 7,000 pages of testimony.

2. The subcommittee is made up of Democrats and Republicans. All agreed on what the statement contained. This unanimity makes it impartial and nonpolitical. The members were talking as Senators and not as Democrats or Republicans.

3. Because of the impartial nature of the statement it will be the background for judging what President Eisenhower proposes, and Congress does, in the days ahead to catch up with and get in front of the Russians.

The statement was grim. It showed beyond question this country has been dragging its feet and has been asleep although it did not attempt to blame either the Truman or Eisenhower administration.

It deliberately avoided blame. It had to. Otherwise, there would have been no unanimity on this statement which limited itself to saying where we've lost and what we need to do.

But Senator Lyndon Johnson, of Texas, Senate Democratic leader and chairman of the subcommittee, in reading the statement to the Senate, did not paint an entirely black picture. He said about Soviet superiority:

"These facts do not give cause for comfort. But we do not consider them a cause for despair or hopelessness. We regard them as a challenge. * * *

"There is nothing in the record to indicate that America has lost its vitality or its capacity to produce in time whatever we need to retain our present power to strike devastating blows * * * at any aggressor.

"While the future is very close—extremely close—it is still under our control."

[From the Corpus Christi Caller-Times of January 26, 1958]

JOHNSON'S REPORT

True to the original purpose stated by its chairman, Senator Lyndon B. Johnson, the Senate Preparedness Subcommittee made no attempt to fix partisan blame for the United States missiles lag in its report released Thursday. Looking to the future rather than the past the subcommittee made 17 broad recommendations in the defense field.

The recommendations ranged from modernizing and strengthening the strategic air arm, ground forces, and Navy to accelerated missile and antimissile programs and reorganization of the Defense Department. The subcommittee's proposals for improving the defense posture of the country did not vary greatly from those already advanced or initiated by the administration in recent weeks.

Democrats who expected the subcommittee to supply them with an almost readymade campaign plan probably will be disappointed. Many of them hoped that some good old-fashioned name calling would improve their chances in an election year.

Those who expected a stinging indictment of Republican ineptness in defense matters overlooked two vital points: (1) That the defense of this Nation cuts across all party lines, and (2) that the Senate Preparedness Subcommittee has for a number of years been dominated by Democrats. The two became inseparable. Democrats could hardly throw the first stone when they could be charged with failure to anticipate the very crisis that now faces us. Neither the Democratic Party nor the people of the United States can profit from partisanship on such a vital issue as the security of the Nation.

[From the Wichita Falls Times of January 26, 1958]

JOHNSON REPORT MEETS CHALLENGE

Last November 25 Chairman Lyndon B. Johnson of the Senate Preparedness Investigating Subcommittee opened the hearings on this country's satellite and missile programs with a statement which outlined these objectives: "A clear definition of the present threat to our security * * * and what is to be done, without traveling up the blind alleys of partisanship."

Two months later the Senate majority leader's subcommittee report is completed. The series of hearings is over. And the results are a blueprint of indicated weaknesses of the Nation's defenses, where the Soviet Union is showing strength, and a blueprint of action which the United States must follow if it is to retain and regain defensive might.

The threat of the Soviet Union is defined in a six-point area. What to do is outlined in 17 recommendations. These are two of the goals which the Texan leader in Congress had set for his

committee. The third and remaining objective was to work in a bipartisan manner, to avoid pinpointing blame for deficiencies, to develop accord and unanimity.

Here, too, success has crowned the magnificent efforts of Senator Johnson. The report of the subcommittee is submitted unanimously by all seven members. It goes even further in this regard by bringing out that on at least 10 points of the 17-point program of action the Government has already made a start—a bipartisan admission in the loftiest realm—and specifically commends Secretary of Defense Neil McElroy for the steps he has taken to strengthen the military position of the United States.

Senator Johnson, personally, and his committee, individually and collectively, have earned the gratitude of fellow Americans for their integrity and their patriotism, their devotion to the task which has been displayed, and their able handling of it.

The committee's report is broader in scope than anything yet compiled. It ranges beyond the Rockefeller report; it is public, whereas the Gaither report reposes in confidential files of the executive department beyond reach even of Members of Congress; and it offers in one package what has not been available from any other source or combination of sources.

We can confidently predict that in the future when any attempt is made to evaluate the progress that is being made to meet the challenges of the space age, it will be the Johnson report which provides the checklist against which advances can be measured.

Congress can be expected to follow the recommendations, not only because they are valid and worthy, but because the committee leader, Senator Johnson, is also in the powerful position of congressional leadership as head of majority party in the Senate.

Circumstance has again placed Senator Johnson in a role at a time of great challenge, and he is again measuring up to time, place, and circumstance.

[From the Houston Press of January 28, 1958]

GET ON WITH THE JOB

White House Assistant Sherman Adams, addressing a Republican rally recently, petulantly charged that Democrats were politicking with defense.

It's true some minor Democratic politicians have tried to make political capital out of the Eisenhower administration's failure to put a satellite into space ahead of Russia's sputnik, just as some small-bore Republicans have been caterwauling that the blame dates back to the Truman regime.

An effective and heartening answer to such picayunish charges is found in the unanimous report of the Senate Preparedness Subcommittee submitted by Chairman Lyndon Johnson.

The unanimity and composition of this subcommittee are as impressive as the substance of this remarkable report.

For the Democrats: Senate party leader Johnson; Senator Symington, former Air Force Secretary; Senator Kefauver, the party's former vice presidential nominee, and that respected southern Democrat, Senator Stennis.

For the Republicans: Senator Bridges, chairman of his party's policy committee; Senator Saltonstall, chairman of the Republican conference; and Senator Flanders of rock-ribbed Vermont.

And they speak in one voice.

It is not a voice of pretty politics, nor of alarm and despair, nor of wishful thinking. It is a voice of patriotism and challenge.

These responsible elective officials, after 110 days of grubbing inquiry into America's defense posture, submit realistic findings that the Soviet Union has a threatening lead in many aspects of science and military power.

They list the imposing accomplishments of our defense establishment in straightening out missile and satellite programs since the sputnik crisis highlighted our military disarray. For what has been done, they give credit to the Defense Department—although obviously many of the steps taken have been at the subcommittee's prodding.

And last, they enumerate important things that yet must be done to put our defenses in order—in our striking airpower, in missile and antimissile development, in building antisubmarine strength, in education, discipline and unity of purpose. And they vote their confidence that the new Defense Secretary, Neil McElroy, will do his part in meeting those challenges.

Here is bipartisan American leadership of the highest order. The country owes the subcommittee a vote of thanks. And more than that—a resolve to follow their lead, put aside shameful bickering, and get on with the job.

How Manmade Satellites Can Affect Our Lives

Extension of Remarks of Hon. Ralph W. Yarborough, of Texas, in the Senate of the United States, Wednesday, February 5, 1958

Mr. Yarborough. Mr. President, I ask unanimous consent to have printed in part in the Appendix of the Record with permission of the National Geographic Society, an internationally copyrighted article, How Manmade Satellites Affect Our Lives, written by Dr. Joseph Kaplan, Chairman of the United States National Committee for the International Geophysical Year.

HOW MANMADE SATELLITES CAN AFFECT OUR LIVES

(By Joseph Kaplan, Ph. D., D. Sc., chairman, United States National Committee for the International Geophysical Year)

(Dr. Kaplan, professor of physics at the University of California at Los Angeles, is outstandingly qualified to discuss satellites. On behalf of the National Academy of Sciences, he supervises all United States participation in the International Geophysical Year. He is also a member of the IGY Technical Panels on Rocketry and the Earth Satellite Program, and has for decades been interested in the problems that satellites are expected to help us solve. One of the world's most distinguished geophysicists, he has headed the Mixed Committee on the Upper Atmosphere of

the International Union of Geodesy and Geophysics, and is the new president of the International Association of Geomagnetism and Aeronomy. Despite the great range of his interests and honors, Dr. Kaplan says that what he likes best is teaching elementary physics to undergraduates whose main interest is not science.—THE EDITOR.)

Early in October, TV and radio brought you some unearthly music you had never heard before—a series of high-pitched notes in subtly varying rhythms, each note distinctly clear and crisp, sounding a little like a one-note xylophone.

What you heard was the music of a sphere, and a most extraordinary sphere at that.

It came from the pioneering artificial satellite, the first thing made by man to become a true celestial body and circle our globe in a predictable orbit. Perhaps you've even been out satellite watching and have followed the telltale spot of brightness in the twilight of dawn or dusk.

The first satellite, launched by Soviet scientists in connection with the International Geophysical Year, was one of a group designed to do essentially the same job as the satellites to be sent aloft as part of the IGY effort of United States scientists.[1] Since I have been concerned with the United States satellite program from its beginning, I want to stress that what follows applies specifically to United States-built satellites, but, in general, to Soviet-built satellites as well.[2]

In view of the great tasks planned for them, these remarkable objects are surprisingly small, measuring less than 2 feet in diameter—about the size of a library globe. (In fact, the test spheres scheduled to precede the full-size United States satellite measure only 6.4 inches in diameter.) Nevertheless, these shining metal balls may well represent humanity's most far-reaching scientific achievement in a century. They already symbolize one of history's boldest exploratory ventures—and promise to bring, before long, benefits to be felt throughout the world.

SPACE HOLDS ANSWERS TO BASIC PROBLEMS

Rather emphatic statements, these, and you may well ask, how so? Why do we want artificial satellites in the first place? Just what will they do up there, flitting by, hundreds of miles above us, and how can they help us in our day-to-day lives down here?

One might answer that satellites can teach us much about the most fundamental problems of science. A lot of the clues we want—in physics, geophysics, and astrophysics, for example, and in meteorology and astronomy—can be found only up where satellites will be, or can be gathered better up there.

On the strictly practical side the data provided by satellites will enable us to improve many things we already possess, such as radio and television communications; satellites will also help us along on the road to achieving things we now only dream of, such

[1] See The International Geophysical Year: Man's Most Ambitious Study of His Environment, by Dr. Hugh L. Dryden, National Geographic Magazine, February 1956.

[2] See "Space Satellites, Tools of Earth Research, by Dr. Heinz Haber, National Geographic Magazine, April 1956.

as predicting the weather accurately, perhaps even controlling it. And since new basic knowledge gleaned through satellites will range literally from the inside of the earth to the sun and beyond, we can expect to be led to achievements we cannot even dream of now, any more than the telephone was dreamed of before the use of electricity.

To enlarge on this outline with more specific answers is the purpose of this article, but first let me project a picture of a typical IGY satellite at work.

DUST FROM SPACE IN DEEP-SEA SLUDGE

Scientists eagerly await the recording of the satellite's signals on magnetic tape. The tape, in turn, can produce jagged patterns on a cathode-ray oscilloscope—similar to a TV picture tube—or on 35-millimeter film.

The film moves 5 feet a second and records patterns that can reveal as many as 48 categories of information. Some of this information concerns the operation of a satellite itself, say the changing strength of its batteries. But the rest reveals things scientists have long wanted to know.

For example, how dense is the meteoric dust in the upper atmosphere? These bits of stone and metal have been estimated to float to the earth at the rate of a thousand tons a day; they can be identified as part of the sludge at the bottom of the oceans.

Whenever a meteoric particle hits the satellite, a microphone notifies its transmitter; a radioed response then shows up in the pattern on the film. That microphone will record particles so small that if one flew into your eye you would hardly notice it.

Not only will we know the number of particles hitting the satellite during its circuit of the earth; one of the jagged lines on the film will enable us to time their impacts within one ten-thousandth of a second. The more recording stations we have, the better we'll be able to pinpoint areas where the count of particles drops or rises significantly.

And so we will learn to what degree the tiny meteors come in showers or spread out more or less evenly in space. These clues will interest not only the astronomer; they may at last yield evidence for the meteorologist, who would like to know whether meteor showers in the upper atmosphere affect rainfall.

By now we know a lot about our earth's surface, but a lot of what we know is not quite accurate. We have only a rough idea of the shape of the earth, for instance: It's like a ball flattened at the top and bottom, but there is a bulge around the middle, and the entire curvature is somewhat irruglar.

This bedevils the geodesist. He can map a country and even a continent with considerable accuracy, by building up a network of triangles through painstaking surveying, and then orienting the entire network on a single marker known as the geodetic datum point. For France this point is in the Pantheon in Paris, and for the United States, Mexico, and Canada it's in a meadow near Lucas, Kans.

This triangulation technique, however, cannot be applied over water, and therefore cannot link continents to one another. Nor

can it yield precise positions for islands in the ocean, relative to continents or to one another. Thus intercontinental distances now are believed to err by as much as 2,000 feet and, some scientists say, even more. The positions of some Pacific islands are in error as much as a mile, and that can cause trouble. Travel across the Pacific, for example, depends heavily on the United States Coast Guard's electronic loran system, which helps ships and planes locate themselves on their charts. But loran itself depends on maps, and if its base stations are off a mile, the guiding patterns they send may be off 5 miles. This can mean the difference between life and death in rescue operations. A satellite can help do away with these errors by giving us a reference point in the sky.

TELESCOPE-CAMERAS TO TRACT SPHERES

First we must compute the satellite's orbit, with the help of ingenious antennas and radio receivers which will record its signals. Then observing stations around the world, equipped with powerful telescope-cameras, will refine the orbit calculations; their photographs, precisely timed and linked with the radio data, will reveal the satellites, elliptical path around the earth. From that we will calculate the location of the earth's center.

From then on, radio signals from the satellite, together with the orbit calculations, will let us locate the positions of the antennas precisely. The United States Army Map Service, which is sending teams to Kwajalein, Luzon, Wake, Guam, and American Samoa, hopes to establish reference points on these islands accurate within 100 feet in respect to each other and to the center of the earth.

When we know the distance from a point on the earth's surface to the center of the earth, we'll also be able to plot the shape of the earth: it will be like constructing a lopsided wheel when you are given spokes of different lengths.

Satellites, then, can serve as visual and electronic reference points in the sky. Thus they could save millions of dollars and make life easier for hundreds of men now mapping with tape and theodolite amid the trackless jungles and snowy peaks of South America.[3]

Satellites may even in a way look inside the earth and confirm or upset some basic geophysical assumptions.

One of these theories concerns the mantle of the earth—that is, the material between the earth's solid crust and its liquid center. This material is thought to have some of the paradoxical qualities of pitch. Hit it hard and it will crack. Put pressure on it gently, and it will give and then revert slowly once the pressure is off. Because of these qualities, some parts of the earth keep rising long after heavy layers of ice have melted. Finland is a case in point. Conversely, the delta areas where the Nile and the Mississippi deposit much silt keep sinking as weight is added.

[3] See Men Who Measure the Earth, by Robert Leslie Conly, National Geographic Magazine, March 1956.

WATERY HILL RISES IN NORTH ATLANTIC

Now some scientists claim that the earth's crust has irregular bumps on its equatorial bulge which raise the sea level as much as 300 feet; supposedly embedded in the crust of the earth are knots of material of such exceptional density that their gravitational pull draws water to swell above them. The Finnish geodesist Tanni speculated that one such watery hill 150 feet high exists in the North Atlantic.

Proof that such bumps exist would cast doubt on the pitch theory of the earth's mantle. It would mean that the mantle must be more rigid than we thought, otherwise those bumps would be flattened by the pull of gravity toward the earth's interior.

How can we make sure? Again, by watching the orbit of a satellite.

SATELLITES WOBBLE AS GRAVITY VARIES

Such bumps on the earth's surface, unlike mountains would vary the gravitational pull on a satellite. This is so because mountains, as a rule, have less mass beneath them than flat land; the bumps on the other hand, supposedly rest on mass as dense as that of flat land. Therefore they should exert more pull on a satellite than either flat land or mountains, thus bringing the satellite closer to the earth and making it wobble a little as it passes over them. These wobbles, recorded by telescopes, will reveal bulges just as a record of the up-and-down motions of your car would describe the uneven surface of a highway.

Now I'd like to tell you about a truly amazing part of the great satellite effort—the measurement of cosmic rays and the cloud belt around our equator, certain energy given off by the sun, and the magnetic forces that surround our globe. But first, I must say something about pure science.

If you visit a scientist in a laboratory and ask him what he's up to, he'll probably be happy to talk. But if you ask, "What will this thing you're doing be good for?" he may become uncomfortable or annoyed, like the pioneering physicist and chemist Michael Faraday when he was asked that question by a member of Parliament. Faraday is supposed to have replied, "I can't tell you what it'll be good for. But I'll tell you this: one of these days you'll be taxing it."

Granted, then, that we cannot always see the link between a highly important scientific discovery and its most practical results until these results have been achieved. We must keep in mind that this is certainly true in the case of much eagerly awaited work to be done with satellites.

The first full size United States satellite will measure the energy radiated to us from the sun in the form of ultraviolet light.

We want to do this because this energy is important to radio communications, and also because it can give us further clues to the behavior of the sun, whose power is really the mainspring of all life on earth, even of the energy that drives your eye muscles as you read this.

Most of the sun's ultraviolet light never reaches the earth—a good thing, or we'd all suffer lethal burns. Instead, some 20 miles

above us a portion of the sun's ultraviolet rays—those with very short wavelengths—interact with oxygen. The result is ozone, and this in turn is a very efficient absorber of the ultraviolet rays of longer wavelengths which would be highly dangerous to life on earth.

This satellite will travel high enough to tap the trunkline from the sun, so to speak, before most of these solar radiations are absorbed by the atmosphere.

"ELECTRICAL WEATHER" BEDEVILS RADIO

The sphere will measure ultraviolet light with ionization chambers. These are thimble-sized cylinders with windows in front to let the radiations enter (p. 795). Once in, they give an electrical charge to a gas inside—they ionize it. The more ionized this gas, the better it conducts electricity. If we record the changing conductivity of the gas, we can tell how much energy comes in through the windows.

Our ionization chambers are adjusted to respond only to energy of a certain wavelength, 1215.7 Angstrom units, which we call Lyman alpha. That happens to be the wavelength of a certain significant percentage of the sun's ultraviolet rays which interests us most right now.

Why? Because Lyman alpha and similar shortwave radiations create havoc with long-range radio communications.

Such radio communications are possible in the first place because ultraviolet rays of extremely short wavelength ionize air particles in the upper ionosphere. This ionization provides a veritable sea of charged particles which forms a reflecting layer, a kind of mirror from which shortwave radio signals shot up from one part of the earth are bounced back to another part. Thanks to this, Marconi managed to send radio signals leapfrogging across the Atlantic in 1901. Before that it was thought impossible to receive radio signals from a transmitter far away because they travel in straight lines, like light, and cannot follow the curvature of the earth.

Lyman alpha energy also ionizes air particles, specifically in the lower border of the ionosphere, below the reflecting mirror we have just described. However, the result is not another reflecting mirror but a sea of particles that absorbs shortwave radio signals. This region keeps changing in density, from day to day and with the seasons. This might be called the electrical weather of the upper atmosphere.

When satellites have taught us a little more about this, we shall know a lot more about why our shortwave communications sometimes cease for hours altogether, or how a police car in Washington, D. C., can lose contact with headquarters and receive music from Paris.

GEIGER COUNTER TO PROBE COSMIC SECRETS

We already suspect that great variations in Lyman alpha intensity coincide with the spasmodic solar flares during which the sun puts out more energy than usual. Satellites might help us

discern more definite patterns in Lyman alpha fluctuations, and let us forecast just when radio communications will be good and when they will be disturbed. Satellites will be especially useful during the IGY because that's the time in the 11-year cycle when solar flares are most active.

The second United States satellite planned for the IGY will carry different instruments and attempt a survey of primary cosmic rays—how many are over what place at what time.

There's much we don't know about cosmic rays. But we can say that they are chiefly hydrogen and helium nuclei, that they move nearly as fast as light, and that they are the most powerful particles we know, many times more powerful than those released by thermonuclear fusion in a hydrogen bomb.[4]

On earth we find it difficult to capture primary cosmic rays—cosmic rays in mint condition, we might say. Various particles in the upper atmosphere interact with them, and what reaches earth is the debris of these collisons. But monitoring satellites will measure primary cosmic rays with a geiger counter, record them on tape, and transmit this information to earth. Such cosmic ray data will be a great contribution to nuclear physics and a source of new clues to the nature of the universe.

SUN ACTS AS A MIGHTY CYCLOTRON

We can produce relatively weak equivalents of cosmic rays with a cyclotron, a machine in which electricity gives speed to atomic particles and magnetism gives them direction. When these forces are applied repeatedly, the particles keep accelerating. We assume that what we do in the laboratory on a small scale, nature does on a vast scale in space: that tremendous energies are generated by cosmic cyclotrons. Our sun is such an accelerator and emits some cosmic rays. But most of them, we believe, come from far in space, and their sources there are still a mystery.

In any case, we already know that the heavier varieties of cosmic rays can kill living cells by destroying the nuclei of their atoms. That's why exposure to primary cosmic rays might endanger people who may some day venture into the upper atmosphere. Satellite data will advance the many serious studies already underway to determine what difficulties man will encounter up there.[5]

Our third major endeavor will be making measurements of the earth's magnetic field, which we have so far been able to do only close to the earth. We know that magnetic force guides cosmic rays so that more shoot toward the poles than toward the equatorial regions. That same force also makes possible the colorful aurora and is closely linked to many communications problems. New knowledge of the earth's magnetic field will aid physicists and enable us to improve our communications in the polar regions.

[4] See Trailing Cosmic Rays in Canada's North, by Martin A. Pomerantz, National Geographic Magazine, January 1953.
[5] See Aviation Medicine on the Threshold of Space, by Allan C. Fisher, Jr., National Geographic Magazine, August 1955.

MAN MAY EVENTUALLY CONTROL WEATHER

People often ask if science can't do something about weather. Actually there's no reason to think that the meteorologist can't do just that. His chain of progress, I think, will be along the lines suggested by my colleague A. F. Spilhaus, dean of the University of Minnesota's Institute of Technology, concerning the dealings of man with nature: first measure; then understand; then predict; and finally you may be able to control.

Of course we've been making meteorological measurements all along. The United States Air Force weather service flies 35,000 miles a day, and the United States Coast Guard spends some $16 million a year to operate 18 weather-patrol ships carrying observers from the Weather Bureau of the Department of Commerce.[6] But perhaps no more than 5 percent of the world's air is being watched regularly.

If we want to predict weather accurately, we need the world-wide picture. That's where satellites come in. One of two weather experiments being readied for United States satellites is to measure the heat budget of the earth.

Most of the heat we get from the sun hits the equatorial regions. Some of it is reflected right back into space. The rest is absorbed where it hits the earth, heating the land and evaporating ocean water. Some of that remaining heat is radiated back into space at night, but most of it passes on to the surrounding areas and toward the poles. The oceans carry about 10 percent, and the rest of the heat, borne by warm, moisture-laden air, flows north and south from the tropical areas.

The excess heat in the tropics and the deficiency at the polar regions are the chief factors behind all our abruptly changeable weather and our slowly changing climate. But we can't accurately predict either unless we know what the earth's heat balance is.

SPHERE TO SCAN EARTH'S CLOUD COVER

Meteorologists say they know fairly closely how much heat comes to the whole earth from the sun over a number of years, and they know that approximately the same amount must go back into space. What they do not know is how much comes daily, monthly, during a season, or yearly, for that matter, and how it is distributed over the earth.

An ingenious satellite, with four measuring devices sticking out like ping-pong balls on spears, can give us data to determine the heat budget over the equatorial belt. You'll get an idea of how this satellite will look and work on page 798. Once we know how much more heat comes down onto the equatorial regions than goes back up, we can calculate how much heat travels toward the poles and thus determines the weather in the Temperate Zones.

Our other weather experiment involves a weather-patrol satellite, to let us keep an eye on the earth's ever-changing cloud cover over a belt 5,000 miles wide. Meteorologists had their appetites

[6] See Rugged Is the World for Bravo, by Phillip M. Swatek, National Geographic Magazine, December 1955.

whetted for this in October 1954 by a photograph made from a rocket 100 miles up, showing the spiral whorl of a hurricane developing over the Gulf of Mexico. But this photo revealed only a small part of the broad pattern, and by the time it was ready for study the storm was over Texas.

The weather-patrol satellite will travel high enough to scan the whole United States from a single point. It will come by every hour and a half, and will carry a photo-electric cell—like the electric eye in a camera exposure meter—to plot the varying light intensities below. The electrical impulses from the cell will give us a series of successive cloud-cover panoramas to help us chart storm patterns.

Such data should take us a long way toward the understanding and prediction of weather.

NITRIC OXIDE LIGHTS UP THE SKY

Now, what about control?

Well, let me tell you about something that happened earlier this year at White Sands, N. Mex. Scientists tossed 20 pounds of nitric oxide some 70 miles above the earth with a rocket just to see what it would do. The results were profound. During the daytime this modest amount of chemicals produced an ionized layer which bounced back radio signals more efficiently than naturally ionized layers. At night, the nitric oxide reacted with oxygen up there to form a blob of light about 2 miles across. At times it was as bright as Venus.

We noticed no effects on the weather. But we realized that we had made a start in the exciting business of modifying the upper atmosphere through chemistry. These experiments will continue, and as satellites and other IGY research projects yield their information serious attempts at weather control may not be far behind.

Now that we're looking a bit into the future, let's also consider how satellites might help us achieve other triumphs of chemistry in the upper atmosphere—speeding up aircraft with power from the sun, for instance, or literally lighting up the world at night.

I stumbled onto my first clues to the chemistry of the upper atmosphere when I was a graduate student at Princeton, 30 years ago. One night I set up an experiment involving an electrical discharge in a glass tube that contained active nitrogen, and went to the movies. Air leaked into the tube somehow, and when I came back I saw the tube glow with a beautiful yellowish-green light.

I analyzed its wave length and found that here for the first time the light of the aurora had been produced in the laboratory by chemical means. Since then we have discovered a lot about the aurora—that nature produces it with electrically charged particles from the sun, mostly protons.[1]

The aurora appears only in high latitudes, but over all the earth the sun's energy produces a similar luminous display—the

[1] See Unlocking Secrets of the Northern Lights, by Carl W. Gartlein, National Geographic Magazine, November 1947.

night airglow. A significant part of this occurs through another chemical reaction—ultraviolet light interacting with oxygen some 60 miles above us. The result is a force which may benefit us greatly. Let me explain.

Oxygen commonly occurs as O_2, meaning two atoms of oxygen stuck together. But up there the sun's ultraviolet rays pull these pairs of atoms apart and leave separate oxygen atoms: simply O, which we call atomic oxygen. The energy which the ultraviolet light expends in doing this passes into these loose oxygen atoms. And when they combine once more into pairs, that energy is released.

This reaction might conceivably be produced in the powerplant of a light plane or rocket traveling 60 to 70 miles high. Thus, once up there, it could utilize this solar energy extracted from atomic oxygen. Admittedly, the amount of energy thus available would not be very large. But then we are only beginning to learn about these phenomena and their possible uses.

PARTICLES SCARCE IN UPPER ATMOSPHERE

We might envision satellites as pieces of laboratory apparatus and the upper atmosphere as a tremendous laboratory where we will carry out experiments impossible on earth.

One advantage for the chemist is that in the upper atmosphere particles of matter are far scarcer than in the best vacuum we can produce on earth. To get an idea of this difference, think of atoms as people, and then compare the New York subway crowd with the number of travelers you might meet in the loneliest parts of the Sahara.

Because particles are so scarce in the upper atmosphere, it takes comparatively small amounts of chemicals to produce reactions spreading out over huge areas. Thus, the larger satellites we consider for the future could be equipped to generate intense ultraviolet light, and so create vast pools of atomic oxygen. Aircraft flying through these pools could utilize that power. Speculation? Yes; but theoretically possible.

With improvements in rocketry, we may eventually manage to shoot a satellite into an orbit 22,000 miles high, where it would circle the earth exactly once in 24 hours. Since the earth also completes one revolution in that time, this satellite could remain, in effect, over the same spot above the Equator. There it could produce ultraviolet light to create airglow artificially and light up a city.

In this way, we could light up the entire North American continent at night to the brightness of a cloudy day.

"ASSISTANT SUN" MIGHT ILLUMINATE WORLD

A number of such satellites—perhaps 10—could light up the world. The total energy required even for this would be surprisingly small, probably no greater than that of the electricity used in New York last night.

You may ask, why light up the world? I don't know. I'm simply pointing out that we may eventually have a sort of assistant sun to command, to turn on or shut off as we wish.

Furthermore there has been speculation for many years that we may be able someday to transmit electric power through radio beams as we now send it through wires. Then a nuclear power-plant to supply a city might operate in a satellite above it.

Plans are already under study for large satellites to retransmit radio, TV, and telephone signals from the earth. Three such satellites, spaced around the world and orbiting at the speed of the earth's rotation, would revolutionize transoceanic communications.

Certain short waves, now useless because they shoot right through the ionosphere, could accommodate millions of telephone conversations and a multitude of television signals.

Now let me touch on how satellites being planned may tell us about the nature of our universe.

Astronomers have a lot to put up with. Looking at the stars through our atmosphere is like looking through a dirty window, and the light that does come into the telescopes is contaminated by the airglow from the earth's upper atmosphere and by scattered light in the lower atmosphere.

We hope that we shall be able eventually to send photometers high above this atmospheric mess to seek better data on the distribution of light in our galaxy, and on the light from the millions of other galaxies, outside our own. The light from other galaxies, if it can be isolated by filters and measured, will help us decide whether the universe is finite or infinite.

[Congressional Record, February 10, 1958]

Appointments to Special Committee on Astronautical and Space Exploration

The Vice President. The Chair makes the following appointments to the Special Committee on Outer Space, which the clerk will read.

The legislative clerk read, as follows:

From the Committee on Appropriations: Mr. Johnson of Texas and Mr. Bridges.

From the Committee on Foreign Relations: Mr. Green and Mr. Wiley.

From the Committee on Armed Services: Mr. Russell and Mr. Saltonstall.

From the Committee on Interstate and Foreign Commerce: Mr. Magnuson and Mr. Bricker.

From the Committee on Government Operations: Mr. McClellan and Mr. Mundt.

From the Joint Committee on Atomic Energy: Mr. Anderson and Mr. Hickenlooper.

From the Committees on Armed Services and Government Operations, ex officio, Committee on Appropriations, Mr. Symington.

PROPOSED SPACE ACT OF 1958—ADDITIONAL COSPONSOR OF BILL

Under authority of the order of the Senate of February 5, 1958,
The name of Mr. Proxmire was added as an additional cosponsor of the bill (S. 3233) to provide for the initiation and support of an inner and outer space study, research, and development program for peaceful uses in commerce and industry which shall include, but shall not be limited to the assimilation, gathering, correlation, and dispersal of information and knowledge relating to, among other fields, weather and communications obtained from rocket ships, satellites, space vehicles and other such media, introduced by Mr. Yarborough on February 5, 1958 (for himself and Senators Mansfield, Hill, Sparkman, Carroll, Humphrey, and Morse).

[Congressional Record, February 13, 1958]

NACA, THE LOGICAL SPACE AGENCY

Extension of remarks of Hon. Estes Kefauver, of Tennessee, in the Senate of the United States, Thursday, February 13, 1958

Mr. KEFAUVER. Mr. President, I ask unanimous consent to have printed in the Appendix of the Record an editorial from Aviation Week of February 3, captioned "NACA, the Logical Space Agency." I am not at this time prepared to agree in full with the editorial, but it is an enlightening contribution to the discussion now going on.

NACA, THE LOGICAL SPACE AGENCY

Too often in recent history, the solution to acute national problems has been sought in the creation of complex new organizations that add to the Federal payroll and bureaucracy but do little about the problems they were created to solve. Often, an economical and effective solution lies close at hand, but is so simple the top-level officials hesitate to even consider it. The current debate over how many and what kinds of organizations the Federal Government needs to organize and guide research and exploration of space appears to be a case in point.

There is no lack of complex plans to tackle our space-age problems. In the midst of this furor it is finally becoming clear that there is in existence an extremely competent organization capable of spearheading this work—the National Advisory Committee for Aeronautics established by the President in 1915 with the directive to "supervise and direct the scientific study of the problems of flight with a view toward their practical solution."

Credit for first calling attention to this simple but effective solution, we believe, belongs to Gen. Orval Cook, president of the Aircraft Industries Association, who told the Institute of Aeronautical Sciences in Washington on January 14:

"One of the things that has most puzzled me during this furor and clamor for Government reorganization so that we can catch up with the Russians has been the fact that NACA has apparently been largely overlooked. Yet here is a Government agency re-

porting directly to the President which has as its basic charter 'the scientific study of the problems of flight with a view toward their practical solution.'

"For more than 40 years NACA has dedicated itself to this task with outstanding success. The NACA has some of the finest aeronautical laboratories in the world—its facilities alone being worth more than $300 million, and an operating staff of some 7,600 people of whom more than 2,000 have professional degrees.

"For more than 10 years it has been conducting research and studies in scientific fields leading to man's conquest of space. In fact early in 1952, months before the first manned flight at Mach 2, NACA studies were launched into the problems of manned flight beyond the atmosphere and their solution. By 1954, NACA research teams were able to propose construction of a research vehicle for this purpose and in December 1955, in cooperation with the Navy and Air Force, a contract for this craft (North American X–15) was let. This vehicle is expected to be test flown within the next 12 months or so.

"NACA also pioneered in research that will pay off in manned boost-glide rockets flying at fantastic speeds and with a new concept that will enable our ballistic missiles to withstand sun-hot temperatures during reentry into the atmosphere.

"At the same time these projects were underway, the NACA has been investigating almost every element in the propulsion spectrum. Research is being conducted in propulsion by ion jets, photon jets, plasma jets, by nuclear rockets, and by solar power. Much more than mere theory is involved—practical experimentation is being conducted and detailed performance parameters are being developed. All of this research is directed toward one goal—flight, manned and unmanned, at incredible speeds through and beyond the earth's atmosphere. All of this vital basic research information is being funneled to the military services and the aviation industry to assist them in development of vehicles to translate this research into reality.

"If, as so many people are advocating, we need a governmental agency to take the responsibility for accelerating our efforts in space travel, I suggest we look to an existing organization such as the NACA to provide this direction."

We heartily endorse General Cook's suggestion and strongly urge Members of Congress concerned with this problem, Defense Secretary McElroy and the public—which will eventually have to pay the bills—to carefully consider this relatively simple but effective solution of a most acute national problem.

There are several additional considerations, in addition to those cited by General Cook, that make the NACA role as the spearhead of our national space research and development effort extremely attractive.

First, it has, through 40 years of experience, established an extremely effective working relationship with all of the other basic organizations concerned with this problem—the military services, the scientific fraternity, and the industrial complexes. Through its main and subcommittee structure, it provides adequate voice for all of these elements in determining a national policy.

Second, the caliber of its leadership evokes universal respect from the other agencies through which it works. There is no better man in the Nation today than James Harold Doolittle, NACA chairman, to serve as a link between the military, scientific, and industrial communities because he has had outstandingly successful careers in all three areas. The scientific leadership of Dr. Hugh L. Dryden, director of NACA, is based on a combination of solid scientific achievement and quiet, but effective administrative ability, all too rare in scientific circles.

Third, NACA has proven its ability in the past to contribute significantly to urgent national technical problems. It developed the laminar flow wing in time to permit the P-51 Mustang to escort heavy bombers to any German target at the critical phase of World War II. Its high speed research aircraft program was an outstanding postwar example of joint work with the military and industry to produce maximum progress in minimum time and launch our military aircraft into the supersonic age a significant jump ahead of all competitors. Its work in ballistic missiles has also solved key bottlenecks in time to be useful in operational weapons.

Fourth, NACA has shown extraordinary ingenuity in devising new research tools required for tackling the unknown. The transonic wind tunnel, rocket powered models, gas dynamics facilities, and multistage research rockets are a few examples of this ability which is absolutely essential in probing new frontiers fruitfully.

It is a major technical fallacy to consider aeronautics as a field that extends to the limits of the earth's atmosphere and astronautics as something that begins where the atmosphere ends. Both are integral parts of the same overall scientific problem. Any successful efforts in making the useful plunge into outer space must be based on the foundation of knowledge already accumulated on flight through the atmosphere from sea level to its outer fringes. Any space vehicle must also successfully pass through the envelope of atmosphere both on its outward and return journeys.

There is a strong case to be made for charging NACA with the job of spearheading our national advance into space with a minimum of time and new money required to achieve the strong possibility of maximum progress. If NACA gets the job, our jump into space will be catapulted from a solid launching pad.

ROBERT HOTZ.

[Congressional Record, February 20, 1958]

THE IMPACT OF WEATHER CONTROL ON THE COLD WAR

Extension of remarks of Hon. Francis Case of South Dakota in the Senate of the United States Thursday, February 20, 1958

Mr. CASE of South Dakota. Mr. President, Capt. Howard T. Orville, Chairman of the President's Advisory Committee on Weather Control, gave a significant address before the University Club of

New York on February 8, 1958. Captain Orville spoke on the subject The Impact of Weather Control on the Cold War. I ask unanimous consent to have printed in the Appendix of the Record the text of Captain Orville's speech.

THE IMPACT OF WEATHER CONTROL ON THE COLD WAR

(By Capt. Howard T. Orville, U. S. Navy (retired))

As much as we dislike it, today we are engaged in a cold war with a nation and its satellites whose leaders are stark realists and who will stop at nothing to achieve their objective—the absolute domination of communism throughout the world. President Eisenhower, in his recent state of the Union message, stated "the threat to our safety and to the hope of a peaceful world * * * is Communist imperialism."

One way of achieving this goal is by means of a worldwide propaganda campaign to lower the stature of the United States in the eyes of the Western Powers. It may well be assumed that they are constantly searching for new sources of material in waging this campaign.

Only last week when the Army successfully fired the Explorer were we able to partially recover some prestige from the terrific loss sustained when the Russians fired two satellites into space. One is still orbiting around the earth. This experience should have taught us that we must be constantly on the alert for seeking the propaganda advantage over the Soviets.

If you will think back to September 1957, or earlier, you will recall that perhaps not one person in a million would have predicted the successful launching of a satellite that would orbit the globe for months. Fantastic, unheard of, impossible, would have been some of the remarks received.

This, then, is an experience very fresh in our minds and should make us aware of the fact that the impossible may become a reality long before the best scientific or military brains can even envisage such an eventuality. In the past we have been slow in assessing the propaganda value of scientific achievements. Let's hope that the future will see us more clairvoyant.

This brings me to the subject of the discussion today—the impact of weather control on the cold war. Few areas of science have implication so profound to all mankind as the study of the atmosphere and the phenomena which occur in it.

Perhaps it would be appropriate to define the terms "weather control." Weather control means that our knowledge of atmospheric processes has reached the level where we are able to apply manmade techniques to large scale weather patterns to start a chain reaction that will produce known results over a specific portion of the globe for a known period of time. For example, if an unfriendly nation were able to bring about the recurring destructive cold spells that have plagued Florida for the past 2 months, this would be absolute weather control.

Prior to the sputnik era the best scientific opinion was that the day of weather control was perhaps 30 to 60 years away, maybe even longer. When, in 1954, I suggested that with the expendi-

ture of $11 billion over a period of 30 to 40 years we might achieve complete weather control, I was severely criticized by my contemporaries.

Since October 1957 there have been many statements (some for too optimistic) by scientists of world renown. Probably one of the most significant statements was made by Dr. Edward Teller before the Senate Military Preparedness Committee. He stated that he was more confident of getting to the moon than changing the weather, but the latter is a possibility. I would not be surprised if the Russians accomplished it in 5 years or failed to do it in the next 50.

What are some of the methods of achieving weather control? A number of methods have been suggested for bringing about major influences on weather or climate. To date, none of them can be called effective methods of weather control because, if applied by any nation, no one knows what would be the resulting action of such drastic intervention on our own country or that of other nations. Until we are able to predict with certainty what will happen when manmade methods are applied, weather control should not be attempted.

USE COLORED PIGMENTS (LAMPBLACK)

One method of controlling the weather that has often been mentioned is the large-scale use of colored pigments over the polar ice surfaces. It is well known that the persistence of large icefields is due in part to the fact that ice both reflects sunlight energy and radiates away terrestial energy at even higher rate than land surfaces. If microscopic layers of colored matter were spread on the ice or in the air above it, it would alter the reflection-radiation balance, melt the ice, and change the local climate. Measures that would bring about such a change are technically and economically feasible.

WARNING CAUSED BY INCREASED CARBON DIOXIDE CONTENT

The carbon dioxide that is released to the atmosphere by industry in the burning of coal and oil and their derivatives (most of it during the last generation) may have changed the composition of the atmosphere sufficiently to bring about a general warming of the world's temperature by about 1° F. This warming represents a 2-percent increase in the carbon dioxide content of the air. Studies show that when the amount has increased up to 10 percent the icecaps will begin to melt with the resulting rise in the sea level. Coastal cities and areas such as New York and Holland would be inundated.

COOLING CAUSED RADIOACTIVE DUST

When the volcano Krakatao erupted in 1883 it released an amount of energy by no means exorbitant. If the dust of the eruption had continued to circle the globe at high altitude for 15 years instead of only 3 years, it would have lowered the world's temperature by 6°. Five such eruptions would have brought

another Ice Age. This temperature is only about 15° below the present world's temperature.

Dr. Teller has testified in congressional hearings that if 2,000 H-bombs were to be exploded over a period of 20 years, the dust floating around in the stratosphere would be sufficient to cause a cooling to bring on a new Ice Age. This, of course, discounts the possibility that the dust might serve as freezing nuclei.

ARTIFICIAL SATELLITES AS PLATFORMS FOR WEATHER CONTROL

Weather satellites equipped with powerful telescopes and television attachments could chart cloud movements, detect the birth of hurricanes or other severe storms, and vastly improve our surveillance of weather patterns.

Dr. Hermann Oberth, of Germany, foresees a gigantic mirror hung in space. It would focus the sun's rays as giant magnifying glass at any desired intensity and beam. The sun's rays could light entire cities or other areas safely at night. The heat of the rays might be used to prevent killing frosts over orchards, or melt Atlantic icebergs, open frozen harbors, and probably bring about artificial control of the weather.

Senator Lyndon Johnson, of Texas, stated, recently: "From space, the masters of infinity could have the power to control the earth's weather, to cause drought and flood, to change the tides and raise the level of the sea, to divert the Gulf Stream, and change temperate climates to frigid."

I have read that at least twice in the past 12 months Moscow has boasted of large public works projects that would upset the entire wind circulation pattern of the Northern Hemisphere; conducted numerous nonpublicized but still detectable experiments apparently aimed at finding ways to speed the melting of polar icecaps; and has even offered to join the United States in a project to turn the Arctic Ocean into a sort of warm water lake by melting the polar icecap.

Russia's apparent preoccupation with plans to change the climate of the Northern Hemisphere is easy to understand. The Soviets and their satellites stand to profit more, from an economic standpoint, than any other combination of nations.

The proposal to turn the now frozen Arctic Ocean into a warm-water lake came over Moscow radio just 3 days after last Christmas.

A Russian engineer, Arkady Borisovich Markin, proposed that a team of international scientists cooperate in designing a dam to redirect the waters of the Pacific Ocean to relieve the severe cold of the Northern Hemisphere. Such a dam built across the Bering Straits would be fitted with thousands of nuclear-energy-powered pumps that would pump the warmer waters from the Pacific into the colder Arctic Ocean. At other times the pumps on the Bering Straits would pump the water from the Arctic Ocean to the Pacific, canceling out the Greenland, Labrador, and other cold oceanic streams.

Just how such a plan would work is not clear to me; but if, as Markin states, the dam would raise the temperatures of such cities

as New York, London, Berlin, Stockholm, and Vladivostock 11° to 14½°, then the melting of the icecaps and the release of landlocked waters would cause seacoast towns and cities to be flooded by the expected rise in the sea levels. This means that Russia might then enjoy warm-water ports and mild temperatures similar to our South Atlantic States, but at the expense of great flooding of the western nations' coastal areas.

Other great schemes for Russian public works programs to divert the course of several of its rivers from the Arctic Ocean to the Caspian Sea are less dramatic, but might eventually upset the present weather patterns over Siberia, which, in time, would affect the weather around the Northern Hemisphere.

There are many other methods by which effective weather control may be practiced by an unfriendly nation, but they are too numerous to even mention by name.

A moment's consideration of any of the methods mentioned here today should serve to convince any skeptic that weather control can have frightening and disastrous consequences if any unfriendly nation succeeds in gaining a breakthrough before we do.

This is, I think, what Dr. Teller meant when he recently stated: "The Russians can conquer us without fighting through a growing scientific and technological preponderance. The Russians may advance so fast in science and leave us so far behind that their way of doing things will be the way, and there will be nothing we can do about it. Imagine, for instance, a world in which the Russians can control weather on a big scale, where they can change the rainfall over Russia. This might very well influence the rainfall in our country in an adverse manner. What kind of world will it be where they have this new kind of control and we do not?"

Now, what courses of action can we take to get out of our present extremely vulnerable position for future Soviet propaganda attacks in the field of weather control? There are two important steps that must be taken.

First, see that Senate bill 86 is passed. Fortunately, through the vision and courage of several Members of Congress, notably Senator Francis Case, of South Dakota; Senator Clinton Anderson, of New Mexico; Senator Arthur Watkins, of Utah, and Senator Warren Magnuson, of Washington, there is now pending in Congress a bill, S. 86, to set up a permanent research program under the National Science Foundation for an accelerated study in all aspects of atmospheric physics. When this bill, which was originated by Senator Francis Case, is passed and is aggressively implemented it will provide for the urgently needed program in basic and applied research.

Second, there must be an awareness and an appreciation of the valuable service that the United States Weather Bureau is performing today under most stringent circumstances. It is understaffed; much of its equipment is obsolete; research facilities are practically nonexistent; its research program is far below that which it should be during these critical times; and the prospects for getting the funds needed to correct these deficiencies are very poor. Other weather services of the Defense Department deal-

ing primarily with military applications of weather control should be given strongest possible support.

Since weather control is an ideal tool for waging the relentless cold war against the western powers, we must not become complacent and we must not be caught as we were when Sputnik I was launched last October.

We must take seriously the truth of Vice President Nixon's statement "the Kremlin has reaffirmed its goal of world domination by nonmilitary means if possible, and by war if necessary."

Weather control has many important nonmilitary applications and just as many military uses.

[Congressional Record, February 26, 1958]

INTERNATIONAL SCIENCE ORGANIZATION TO EXPEDITE THE SPACE AGE

* * *

* * * Mr. WILEY. We turn now to what I consider to be the major challenge of the space age—that of utilizing this new frontier only for peaceful purposes.

It would be appalling to think that mankind, using all its ingenuity arrived at the threshold of this new era only to use it as a means of destroying itself.

This, I am sure, is not a part of the plan of the great Creator of the universe. I hope that future generations will look upon man's arrival at the space age as the time when he came to his senses and discontinued the practice of making war. Mankind in the future should be able to look with pride upon its ancestors of all nationalities and political philosophies who finally reached the maturity to stop quarreling among themselves, and to unite in the common objectives of exploring the universe. The time to arrive at that maturity is now.

PROPOSED NEW INTERNATIONAL SPACE ORGANIZATION

We have arrived at this great new era through the utilization of scientific thought. I believe that it may well be that scientists can show us the way for forgetting petty differences and uniting our efforts toward one common goal.

I suggest that scientists of our Nation, working through national scientific organizations, investigate the possibility of forming an international scientific organization on outer-space problems. This group of scientists would represent the best brainpower of all nations of the earth to plan for coordinated and dynamic programs of peaceful utilization of outer space.

This organization could:

1. Encourage scientific cooperation between nations which could never be accomplished through other isolated channels.

2. It would encourage scientific thought without basing this thought primarily on political philosophies.

3. It would encourage scientists from Soviet Russia to use the data they have acquired from their sputniks and other re-

search programs to try to further international scientific objectives, to the extent that they are permitted to do so.

4. Above all, by spearheading this organization, the United States would clearly demonstrate to all nations of the world that America is taking the leadership in planning for peaceful uses of outer space.

A program of this type would possibly speed by many years the accomplishment of many objectives of peaceful programs for space. If the nations of the world must continually plan a space program which is based on war and peace, they are cutting the efficiency of their research programs almost in half.

I wish to emphasize that this organization should deal with problems of a purely scientific nature. Leave political aspects of control of outer space to statesmen. But let us see if the scientists who have brought us to this point in history cannot show us the way around the current barriers.

* * * * * * *

[From the New York Times of February 23, 1958]

SPACE LAW URGED BEYOND 53 MILES—McGILL PROFESSOR TELLS BAR ATMOSPHERIC LIMIT OUGHT TO DECIDE SOVEREIGNTY

ATLANTA, February 22.—The American Bar Association was told today that national sovereignty should end 53 miles up in the air. The law of outer space—whatever it is—would take over then.

John Cobb Cooper, a McGill University professor who is an expert on space law, said international control was the only practical answer. And he said governments had already indicated some acceptance of the principle.

Space law was one topic today at a combined southern regional and midwinter session of the bar association. Some 2,000 lawyers are here for the meetings.

A special committee to study the legal problems of space was set up by the ABA's section on international and comparative law. It includes representatives of the State Department and the armed services.

DISCUSSES TWO QUESTIONS

Professor Cooper discussed these questions:

Where does outer space begin? What law or laws should govern it?

Mr. Cooper noted that the United States and most other countries claimed complete sovereignty in the airspace over their territory. This means that no plane or other objects may enter that air without permission.

But, Mr. Cooper said, legally the word "airspace" covers only that portion of the atmosphere where there is enough air to provide some aerodynamic lift for airplanes or balloons.

He quoted scientific opinion that 53 miles up was the last point where the air was dense enough to give any lift to an airplane. That is about twice as high as any plane has flown.

Thus Mr. Cooper concluded that no country had really staked out a claim to own or control space beyond the 53-mile mark.

As a practical matter, Mr. Cooper said, nations have already recognized that something beyond a national government must deal with outer space. He cited the fact that the three satellites that have circled the earth in recent months must have passed over every country but that none had protested any violation of sovereignty.

Mr. Cooper said chaos was the only alternative to some form of international control. He urged an agreement—negotiated through the United Nations—to set up an international body for regulation of space guidance.

BUFFER ZONE STUDIED

The first problem of any international organization, he said, would be to try to draw a line between nationally controlled air space and outer space. He said there might have to be an intermediate zone where there was some atmosphere, but not much.

The space law committee set up today has David F. Maxwell of Philadelphia, a past president of the bar as chairman. Other members are:

Loftus Becker, legal adviser of the State Department; Ralph E. Becker, of Washington; Professor Cooper, Arnold W. Knauth, of the International Law Association; A. C. Lazure, of the Army Ordnance Department; Dean Edward Levi, of the University of Chicago Law School, and Prof. Leon Lipson and M. J. McDougal, of the Yale Law School.

Also Dean John Ritchie 3d, of the Northwestern University Law School; Dean Robert E. Sullivan, of the Montana University Law School; Rear Adm. Chester Ward, the Navy Judge Advocate General; Frank Simpson 3d, of Los Angeles and Andrew G. Haley, of the American Rocket Society.

[Congressional Record, March 3, 1958]

SPACE TECHNOLOGY AND THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

Extension of Remarks of Hon. Harry Flood Byrd, of Virginia, in the Senate of the United States, Monday, March 3, 1958

Mr. BYRD. Mr. President, I ask unanimous consent to have printed in the Appendix of the Record a very able speech delivered by Dr. Hugh L. Dryden, director, National Advisory Committee for Aeronautics, entitled "Space Technology and the NACA"; also a resolution adopted by the National Advisory Committee for Aeronautics. The NACA conducts an aeronautical laboratory near Hampton, Va.

SPACE TECHNOLOGY AND THE NACA

(Address delivered by Hugh L. Dryden, Director, National Advisory Committee for Aeronautics, at luncheon meeting of the Institute of the Aeronautical Sciences, New York, N. Y., January 27, 1958)

The topic of our day is the new frontier, space, and the new challenge, the conquest of space. The escape of objects and man

himself from the earth into space has long been the subject of science fiction writers and the comic-strip artists. More recently, it has been a matter of interest to a growing number of serious-minded scientists. Now, it has acquired a new sense of imminence and reality. Space travel has stirred the imagination of man to an extraordinary degree. It is, however, one thing to desire to travel in space, and quite another to satisfy that desire. Early accomplishment of this goal will require major advances in science and technology.

This effort will stimulate industrial and economic development. Space vehicles will open the way to acquisition of much new knowledge about the earth and the universe. They will enable development of new military weapons. They will bring great national prestige.

The launching of the first manmade satellite on October 4 of last year produced an extreme swing of the pendulum from general lack of interest in space travel and even ridicule of its proponents, to expectation of early interplanetary flight. This essentially emotional reaction may make it very difficult to proceed with a sound program. Engineers have a special responsibility to be bold and imaginative, and yet they must be thoroughly realistic and practical. We must do our share in acquainting the public with the characteristic difference between engineering and technology, and other professions and fields of endeavor.

In many professions, for example, law, education, diplomacy, the spoken or written word plays a dominant role in accomplishment. The lawyer prepares a brief with great care, but often the key factor is the skill with which he pleads his case, and thus persuades others to accept his conclusions. Lawmakers debate the issues and resolve them by compromise and majority vote. Similarly in other fields, in sales and even in banking. A characteristic feature is that when the discussion ends in decision, the result is immediately at hand. There is no timelag or only a very small timelag between decision and accomplishment.

In engineering there is also much discussion, debate, and compromise. But when decision is reached to build a bridge, an airplane, or a space craft, there remains the "hardware" construction. The materials of our physical world cannot be talked or argued into the desired shape. There is a long timelag between the decision and the completion of the bridge, or airplane, or space craft. Like the time span between conception and birth of a child, no amount of discussion or investment of money can reduce this time interval to zero. Thus travel to the moon by manned or unmanned vehicles will require more than discussion and decision and allocation of funds. It will require much effort and time and will be soonest achieved by a systematic and orderly program of research and development. The public must be understanding and patient with the scientists and engineers in addition to providing the necessary funds.

I wish to discuss with you briefly my own views as to what the national program should be, the role of research, and specifically the role of the NACA. In speaking of the program as a national program I do not wish to exclude the possibility of the program

being an international one; its technical character would be the same.

In my opinion the goal of the program should be the development of manned satellites and the travel of man to the moon and nearby planets. I omit for the present travel outside the solar system since the probable travel times seem well beyond the adult life of an individual even with optimistic extrapolations of known science and technology. The immediate goals should be more limited, and these I will discuss a little later.

There is rather good agreement that there are at least three general aspects of an adequate space program. These are: (1) Research in space technology to provide data for the design of useful and efficient vehicles, the provision of a safe environment for man and otherwise to insure the success of manned space flight operations; (2) design and development of scientific and military space vehicles and their launching, flight, and recovery; and (3) research on the phenomena of the high upper atmosphere and nearby space, such as the character and distribution of matter, cosmic rays, solar radiation, electric, magnetic, and gravitational fields, etc., and scientific studies of the universe made possible by the use of satellites and space platforms as observation sites.

You know as well as I, how eagerly those in astronomy, geophysics, and meteorology—to name only three of the interested scientific groups—anticipate the tremendous advantages that will result from such observation sites in space.

The development and operation of military missiles, military satellites, and military space vehicles are clearly a military function and it is well understood that a vigorous program is necessary. It is not so well understood by the general public that additional vehicles and operations will be required for scientific research on space phenomena and scientific exploration of the universe, in addition to those employed for research in space technology. The national program must include both nonmilitary and military aspects. It is perhaps the nonmilitary aspects of space flight that will have the greatest impact on the thinking and the future of all mankind.

The organization of the national effort is receiving much study. As you know the President and Secretary of Defense have announced the formation of an Advanced Research Projects Agency within the Department of Defense to which responsibility for military space projects is to be assigned. Responsibility for nonmilitary aspects has not yet been fully determined. Some groups have recommended the creation of a completely new independent civilian agency of Government to conduct research and development in its own laboratories or by contract, to contract for and sponsor development of components and vehicles, and to engage in space flight operations. Some of these proposals restrict the activities of the proposed new agency to nonmilitary projects; others include at least the research aspects of military projects.

The basic reason underlying these proposals for a new civilian agency is plain. The scientific community, understandably, is worried about the possibility that the extremely important nonmilitary aspects of space technology would be submerged or per-

haps even lost if included as a mere adjunct to a military program.

There is another solution to the problem of how best to administer the national space-technology program, one which clearly recognizes the essential quality of our goals—the prompt and full exploitation of the potentials of flight into space for both scientific and military purposes. Actually, this solution is old and well-tested. It is explicitly stated in the 1955 legislation that established the National Advisory Committee for Aeronautics with responsibility to supervise and direct the scientific study of the problems of flight, with a view to their practical solution. The committee structure of the NACA embraces both the nonmilitary and the military elements of aeronautics. The researches of the NACA are designed to be useful to both the nonmilitary and the military segments of aeronautics. The entire operation of the NACA is based upon the premise that coordinated teamwork effort by all parties concerned provides the surest guaranty of progress in aeronautics.

At its meeting on January 16, 1958 the National Advisory Committee for Aeronautics expressed its view that the national space program can be most rapidly, effectively, and efficiently implemented by the cooperative effort of the Department of Defense, the National Advisory Committee for Aeronautics, the National Academy of Sciences and the National Science Foundation together with universities, research institutions, and industrial companies of the Nation. Under this plan the National Science Foundation in collaboration with the National Academy of Sciences would plan scientific experiments and assign priorities for research on space phenomena for basic scientific purposes as previously described. The National Science Foundation would assume responsibility for financial support of scientists in the detailed planning, design and construction of special apparatus, related research and analysis of data for approved projects. The National Advisory Committee for Aeronautics would conduct flights for scientific purposes when within its capabilities or jointly, with appropriate agencies of the Department of Defense, in the successful pattern of the research airplane programs. The NACA would also coordinate and conduct research in space technology in its own laboratories and by contract in support of both military and nonmilitary projects.

Since the end of World War II the NACA has been engaged increasingly in research applicable to the problems of space flight and has designed and constructed the special aerodynamic, structural, and propulsion facilities required for this work. For example, studies were formally initiated in 1952 leading to the X–15 research airplane project, a cooperative project between the NACA, Air Force, and the Navy. North American Aviation is now building the X–15 and it is scheduled to make its first flight in about 1 year. The X–15 will be used to explore problems of manned flight into nearby space, particularly the control of the altitude of the vehicle in space in the absence of aerodynamic forces, the safe return from space to the atmosphere without destructive heating, and the effect of weightlessness on the pilot.

The NACA is also engaged in studies of satellite configurations suitable for safe reentry at still higher speeds, both for manned and unmanned flight. The present program is far from adequate. Our rate of progress in solving the problems of space flight must be very greatly increased. The problem is essentially one of extension and expansion of effort. For this purpose new research facilities will be needed at existing laboratories and at new laboratories, including a launching site for space flights for research purposes. A larger staff will, of course, be needed. A greatly expanded contract research program is similarly essential to obtain assistance from groups with special competence in specific areas. Thus special talents, experienced staffs, and facilities of existing organizations can be pooled for the accelerated effort that is required. I would emphasize that these organizations already have demonstrated that they can work together successfully, and, perhaps equally important, that they have established the necessary close relationships with the scientific community and with industry.

To provide material assistance in its program the NACA recently appointed a special committee on space technology under the chairmanship of Dr. H. G. Stever, associate dean of engineering of the Massachusetts Institute of Technology. A partial list of the members of the new committee includes:

Mr. H. Julian Allen, Ames Aeronautical Laboratory.

Dr. Hendrik W. Bode, director of mathematical research, Bell Telephone Laboratories.

Dr. Milton U. Clauser, director of aeronautical laboratory, the Ramo-Wooldridge Corp.

Prof. Dale R. Corson, Cornell University.

Mr. James R. Dempsey, manager, astronautics division, Convair.

Mr. Robert R. Gilruth, Langley Aeronautical Laboratory.

Mr. S. K. Hoffman, general manager, Rocketdyne division, North American Aviation, Inc.

Dr. W. Randolph Lovelace II, Lovelace Clinic.

Dr. William H. Pickering, director, jet propulsion laboratory, California Institute of Technology.

Dr. Louis N. Ridenour, Jr., missile systems division, Lockheed Aircraft Corp.

Mr. Abe Silverstein, Lewis Flight Propulsion Laboratory.

Dr. James A. Van Allen, department of physics, State University of Iowa.

Dr. Wernher von Braun, Director, Development Operations Division, Army Ballistic Missile Agency.

The committee will also include representatives of the Air Force and Navy not yet designated.

This committee will take a fresh look at the research and development problems of space technology and make recommendations as to the needed programs. The first meeting of the committee has been scheduled for February 13. The major research fields which must find a place in the overall national program include space mechanics; space environment; energy sources; propulsion

systems; vehicle configuration and structure; materials; launch, rendezvous, reentry, and recovery; communication, navigation, and guidance; space biology; flight simulation; measurement and observation techniques.

The design and development of vehicles should proceed simultaneously with research on space technology. While the goal is manned flight to planets within the solar system, the vehicle program must proceed in stepwise fashion. We have something to learn from the U. S. S. R. experience. So far as we know, they began as did we, with a supply of German V–2 rockets and the aid of German scientists and engineers. In contrast to our own development, their program proceeded in logical steps with consistent support from top government officials and at high priority. Larger and larger rockets were developed by the U. S. S. R. scientists, leading to ballistic missiles of steadily increasing range, with many missiles built and fired. A group was organized for scientific work on phenomena in the high atmosphere, using rockets. In addition to physical apparatus, animals were sent aloft, including dogs. As experience was gained and reliability increased, the first satellite was launched, followed soon by the second carrying the dog, Laika. It is said that Laika had already been aloft on a rocket and been safely returned. Probably the Sputnik II was the same type of rocket used in that work, now boosted into satellite orbit by large rockets from the ballistic-missile program.

We need a similar step-by-step program, each step fully tested. I think there will be needed two parallel lines of vehicle development, one unmanned, which should be able to proceed rapidly, and the other man carrying, whose development will probably be somewhat slower. I personally am unwilling to be a party to trying to put a brave young pioneer into orbit until his demonstrated chance of successful return is much better than 50 percent. The earliest vehicles will be progressively larger unmanned satellites, carrying more and more complex equipment to perform more and more difficult scientific and engineering tasks. We may expect these to be followed by unmanned vehicles which travel around the moon, and later those which land on it. This line of development has already attained its first objective.

Concurrently, there should be a systematic program on manned vehicles. The X–15 is a research tool to get some experience in flight into nearby space. Other projects should be initiated promptly toward the goal of manned satellite flight. As the chief milestones are passed, other, more advanced goals should be set.

We have the talents and the resources to assure that we in America can lead the way. It is imperative, for the peace and welfare of the world, that we shall lead the way.

As I think about what lies ahead, I am reminded of the comment of Wilbur Wright, voiced many years ago: "It is not necessary to look too far into the future; we see enough already to be certain that it will be magnificent."

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS RESOLUTION ON THE SUBJECT OF SPACE FLIGHT, ADOPTED JANUARY 16, 1958

Whereas the National Advisory Committee for Aeronautics is authorized by act of Congress (U. S. Code, title 50, sec. 151) to "supervise and direct the scientific study of the problems of flight, with a view to their practical solution * * * and to direct and conduct research and experiment in aeronautics"; and

Whereas the advancing flight performance of unmanned vehicles has reached outside the atmosphere into nearby space and the exploration of space by manned vehicles will soon begin; and

Whereas in the opinion of the Committee, the broad authority in its organic act includes the investigation of problems relating to flight in all its aspects, outside of, or within the earth's atmosphere, of aircraft, missiles, satellites, and outer-space projectiles and vehicles; and

Whereas the problems of space technology include energy sources, propulsion, materials, structures, control, guidance, communication, environment, launching, recovery, and human limitations and requirements with respect to the flight of such vehicles; and

Whereas since the end of World War II the National Advisory Committee for Aeronautics has been increasingly engaged in research applicable to the problems of space flight and has designed and constructed the special aerodynamic, propulsion, and structures facilities required for this work;

Whereas the National Advisory Committee for Aeronautics in 1952 formally initiated studies of the problems associated with unmanned and manned flight at altitudes from 50 miles up and at speeds from mach number 10 to the velocity of escape from the earth's gravity which resulted in the cooperative NACA-USAF-USN project, the X–15 research airplane designed and now under construction for studying some of the problems of manned flight in nearby space; and

Whereas the urgency of an adequate national program of research and development leading to manned satellites, lunar, and interplanetary flight is now apparent:

Be it resolved, That the National Advisory Committee for Aeronautics express its view that an adequate national program must enlist the scientific and engineering resources of the Nation and must include:

1. Research in space technology to provide data for the design of useful and efficient vehicles and to insure the success of manned space flight operations.

2. Design and development of scientific and military space vehicles and their launching, flight and recovery.

3. Research on the phenomena of the high upper atmosphere and nearby space, such as the character and distribution of matter, cosmic rays, solar radiation, electric, magnetic, and gravitational fields, etc., and scientific studies of the universe made possible by the use of satellites and space platforms as observation sites.

Be it further resolved, That the National Advisory Committee for Aeronautics express its views that the national program can be most rapidly, effectively, and efficiently implemented by the cooperative effort of the Department of Defense, the National Advisory Committee for Aeronautics, the National Academy of Sciences, and the National Science Foundation, together with universities, research institutions, and industrial companies of the Nation.

Be it further resolved, That the National Advisory Committee for Aeronautics express its views that the development and operation of military missiles, military satellites, and military space vehicles is clearly the function of the Department of Defense; that additional vehicles and operations will be required for scientic research on space phenomena as well as for research in space technology; that these scientific flights should be conducted by the National Advisory Committee for Aeronautics when within its capabilities or jointly by the appropriate agencies of the Department of Defense and the National Advisory Committee for Aeronautics in the successful pattern of the research airplane programs with the cooperation of the National Science Foundation; that planning of scientific experiments and the assignment of priorities for research on space phenomena for basic scientific purposes be conducted by the National Science Foundation and the National Academy of Sciences and that the National Science Foundation assume responsibility for financial support; that the National Advisory Committee for Aeronautics has an important responsibility for coordinating and for conducting research in space technology either in its own laboratories or by contract, and therefore should expand its existing program and add supplementary facilities to those now available as necessary.

Be it further resolved, That the NACA Special Committee on Space Technology be requested to review the needed research and development in the light of the guidelines given above with a view to the early formulation of an adequate and sound program for the National Advisory Committee for Aeronautics.

[Congressional Record, March 17, 1958]

Launching and Placing of Vanguard in Orbit

Mr. Knowland. Mr. President, I am pleased to state at this session of the Senate that the Vanguard has been successfully launched and is in its orbit. All of us are familiar with what must have been some frustrating experiences of those charged with the responsibility, and, undoubtedly, many of us understand what some of the problems were. I think we shall want certainly without regard to partisanship to compliment the Navy, the fine group of organizations, and the other services that cooperated in the common effort. We think those who took part in the effort perhaps had the luck of the Irish, on this St. Patrick's Day, getting the satellite into orbit.

Mr. Bush. Mr. President, I desire to join with the minority leader in expressing my gratification—indeed, my elation—at the success of the Navy in launching the Vanguard with its satellitie, which is now

in orbit. This is a reward of patience and of great ingenuity and courage on the part of the Navy. I certainly want to join the Senator from California, in congratulating the Navy upon this splendid achievement.

Mr. JOHNSON of Texas. Mr. President, will the Senator yield?

The ACTING PRESIDENT pro tempore. Does the Senator from Connecticut yield to the Senator from Texas?

Mr. BUSH. I yield.

Mr. JOHNSON of Texas. I wish to ask the privilege of associating myself with the statements of the Senator from California [Mr. Knowland], and the Senator from Connecticut [Mr. Bush] with regard to the successful launching of the Vanguard. I commend both Senators for their very great interest and more than usual activity with relation to the defense of the Nation, as well as for their patriotism. No member of the Committee on Armed Services has contributed more to our successful hearings, which lasted more than 3 months, than the Senator from Connecticut. I should like to recognize that fact and point it up at this time, and, at the same time, express my great pride in our Government for its most recent success, even though it is simply one of a series of successes.

UNITED NATIONS CONTROL OF OUTER SPACE

Mr. MANSFIELD. Mr. President, once again the United States has been placed on the defensive in the cold war. Once again we find ourselves in a position where we must explain, and justify, and stammer.

This situation would be deplorable enough if it resulted from a weakness in our position. But it is even more tragic than that. The fact is that we led our weakest cards from a position of strength.

This morning's New York Times carries an article by a distinguished diplomatic correspondent, E. W. Kenworthy. * * *

[From the New York Times of March 17, 1958]

UNITED STATES AIDES CONCEDE SOVIET SPACE PLAN IS PROPAGANDA GAIN

(By E. W. Kenworthy)

WASHINGTON, March 16.—The Soviet Union's proposal for control of outer space was a brilliantly conceived, executed and timed propaganda stroke, in the view of some officials here.

In a statement issued yesterday, the Soviet Foreign Ministry proposed a United Nations agency to police a ban on outer space missiles and administer a program for the peaceful use of space.

The plan was conditioned on the removal of United States overseas military bases, first and foremost in Europe, the Middle East, and north Africa.

IMPACT IN NATO ENVISAGED

After reading the text of the statement, some officials here felt that Moscow might have scored a coup that could have considerable impact not only in neutral nations but also in some North Atlantic Treaty countries.

These officials said the condition that made the Soviet proposal so obviously unacceptable to the United States might appear reasonable to many persons in these countries if they accepted Moscow's plausible justification for it.

As the Soviet plan for a United Nations body to supervise peaceful space research, the consensus of many officials here was, we got scooped.

These are the points made by officials today in conceding that the Soviet plan was a shrewd propaganda move:

First, they note that the Soviet plan was prefaced by a long passage impugning the motives behind President Eisenhower's peaceful space proposal in his letter to Premier Nikolai A. Bulganin of January 12.

The Soviet statement said:

"In making this proposal, President Eisenhower singled out from the general disarmament problem the question of intercontinental ballistic missiles. * * * He proposes, in fact, to ban intercontinental ballistic missiles only. * * * It is noteworthy that, while proposing a ban on the intercontinental ballistic missile, the United States builds its military plans on the use of atom and hydrogen bombs as warheads in the short and medium-range rockets which they already possess."

In short, the Soviet statement says, the United States is trying to ban the weapon "which could be used against objectives on the territory of the United States," while insisting on retaining the bases from which it can reach the Soviet Union with nuclear-armed intermediate-range missiles and strategic bombers.

Officials note that there is a large distortion here. In his letter to Premier Bulganin, the President did not single out intercontinental ballistic missiles, or even mention them.

General Eisenhower called for an agreement banning all weapons using outer space, which would include both ICBM's and IRBM's. Actually, officials here comment, studies on the implementation of the President's proposal specifically mention a ban on the testing and use of both types of missiles.

These officials also note that the Soviet argument can be turned around. The Soviet Union holds captive all of Eastern Europe except Yugoslavia, refusing to permit free elections. Its ground forces far out number those of the NATO alliance. The great allied deterrent to extension of Soviet power is the United States Strategic Air Force.

If the United States is to dismantle its overseas air bases, then, these officials maintain, the Soviet Union should agree to free its satellites, reduce its land forces and withdraw them within the Soviet Union.

Nevertheless, these officials concede the skillfulness with which the Soviet Union is using the argument that they want us to pick up our slingshots but they won't give up their club.

Second, those officials concede that Moscow got the jump on us by suggesting a United Nations agency. They say, somewhat ruefully, that the administration has not followed up the initiative gained by the President's proposal to Premier Bulganin.

Oddly enough, they recall, studies undertaken here immediately after the President's letter sugested that, as soon as the United States successfully launched its first satellite, the President should make a statement urging a United Nations program for the peaceful use of outer space and declaring United States intentions to introduce a resolution to that effect in the next session of the General Assembly.

These officials also note that the same studies made general recommendations parallel with those advanced by the Soviet Union, a missile ban, control and inspection by a United Nations body and coordination of national research programs on peaceful use of space by the United Nations.

SOVIET TEXT CORRECTION

LONDON, March 16.—The text of a statement issued by the Soviet Foreign Ministry yesterday as issued by the Soviet news agency Tass and transmitted by Reuters, omitted through a transmission error a phrase that altered the sense of one sentence.

The sentence in question read: "Why is it then that the American proposals suggest the outlawing of intercontinental ballistic rockets which could be used against objectives on the territory of the United States of America, while evading the question of eliminating American military bases on foreign territories intended to launch rockets possessed by the United States Armed Forces and for the use of American bombers?"

The corrected sentence should read: "Why is it then that the American proposals suggest the outlawing of intercontinental ballistic rockets, which in the case of a retaliatory blow, and only in that case, could be used against objectives, etc."

THE SIGNIFICANCE OF THE AMERICAN SATELLITE EXPLORER

Mr. JOHNSON of Texas. Mr. President, on Friday, some very anxious moments for our people came to an end. An American satellite was put into orbit and at this moment is circling the globe.

The Explorer is a triumph of persistence against great odds. It represents the dedicated work of men like General Medaris, Wernher von Braun, and numberless scientists and technicians who will never receive their fair share of credit.

Our satellite is very aptly named. It is truly an explorer—a representative of the free people searching for the facts of a totally new dimension into which men and women will soon step. And, in its search for facts, it brings us face to face with a sharp reality which we cannot ignore.

Neither the Explorer nor its Soviet predecessors can be considered military weapons. They are merely collectors of data which they are transmitting or have transmitted back to earth-bound men.

But the facts and figures of the physical world are of a peculiar nature. They have no loyalty, no patriotism, no system of

morality and ethics. They are available for the advancement of mankind, or for the destruction of mankind.

The science of biology has given us penicillin and germ warfare. The science of chemistry has given us medicine and poison gas. The science of physics has given us new sources of useful power and the hydrogen bomb.

Now a new science—astronautics—is moving rapidly from the drawing board to the workshop. Will it give us new frontiers or new forms of total devastation?

To continue the arms race at this time will inevitably bring us to the point of no return. There must be action now—now, while there is still time to bring the new forces under control.

It is not difficult to forecast the future if the present situation continues. This will be the world of the manic depressive—high points of elation when "we" make an important advance; low points of despair when "they" outstrip us.

And at some interval when "we" are at a low point and "they" are at a high point, somebody is going to press the button.

There is no point in deluding ourselves that "we" can just call off the arms race on our own initiative. There is no point in debating why they do not call off the arms race at their own initiative.

The only worthwhile discussion is what is said in the effort to find ways and means of breaking the logjam—of bringing the tragedy of the cold war to an end.

This is the time to act—now, while the satellites are searching for facts instead of for targets.

I would hope that our leaders would give urgent consideration to a proposal for joint exploration of outer space by the United Nations. I would hope that this proposal could be pressed earnestly, vigorously, and with all the sincerity at our command.

No one would stand to lose by this proposal. The alternative is a disorderly arms race which can end only in death and destruction.

For the moment, our prestige is at a high point. There is no better time for a display of the generosity, the initiative, and the constructive desire for peace which lies in the soul of the American people.

The president of the United Nations General Assembly—Sir Leslie Munro—has spoken the desires of the world. He says the nations are looking for leadership in the drive into outer space.

We have heard this morning that our President has received another letter from Soviet Premier Bulganin. It rejects the idea of a foreign ministers' conference as a precondition to a summit conference.

Whatever the note may say, however, there has never before been a more golden opportunity to bring this war-weary world to peace. A strong and determined proposal to cooperate now may save all of us from a strong and determined—and probably successful—effort to destroy humanity later.

Mr. President, I ask unanimous consent to have printed in the Record at this point as a part of my remarks a United Press dispatch from the United Nations headed "U. N. Talks Urged on Outer Space."

There being no objection, the dispatch was ordered to be printed in the Record, as follows:

"U. N. TALKS URGED ON OUTER SPACE

"UNITED NATIONS, N. Y., January 31.—General Assembly President Sir Leslie Munro, of New Zealand, tonight suggested a U. N. conference of scientists and diplomats within the next 2 or 3 months to study control of outer space.

"Munro, who has spoken several times of the need to get United Nations action started to deal with the age of space, made the suggestion in a broadcast interview recorded for U. N. radio.

"Munro said that despite many references by President Eisenhower and others to the need for space control, there has been no initiative except in embryo to bring the issue to the U. N."

ADDRESS BY SENATOR LYNDON B. JOHNSON, OF TEXAS, BEFORE A MEETING OF CBS AFFILIATES, WASHINGTON, D. C., JANUARY 14, 1958

I am here today to speak to a group which has a grave responsibility for informing our people.

In the Chamber of the Senate of the United States, I am the designated leader of the majority party. That is a title of which I am proud but one which carries with it responsibilities that would cause any man to be humble. But it is a designation which, for this occasion, I have left behind.

I am not here as a Democrat.

I am not here as a leader of the Senate.

I am here as an American.

In this town, we have the habit of dividing all things by lines of affiliation: the offices, the jobs, the various positions, and sometimes even our judgments.

At this hour in our history, I for one, believe that there are certain facts which cannot be divided along such lines and certain judgments we must reach and decisions we must make together, as Americans, and as Americans only.

Even as we sit here at these tables there orbits in the sky above us—around and around this earth—the most compelling fact of our times.

The sputniks out in space have only one meaning.

There is no Democratic meaning.

There is no Republican meaning.

There is, in truth, no narrow American meaning.

In all history, mankind has never faced so great a challenge—or so great an opportunity. If outer space is allowed to become the province of the earth's imperialists, then the freedom we have fashioned at so high a price shall fall into eternal jeopardy.

If, however, freemen set their sails for this new world as our forebears did when this continent was opened, then we have the opportunity of adding a new dimension to freedom—and, with it, the very real prospect of reaching our goal of total peace.

These are exciting thoughts, exciting goals.

We would be out of character with our American heritage if we were not stirred by what we can now see on ahead in this new age.

We would be even more out of character—both as Americans and as free men—if we should lose this hour of opportunity in preoccupation with partisan thoughts of who is to receive the credit and who is to receive the blame.

Facts are not partisan, and the facts are these:

For a decade now, the free world—led by the United States—has summoned up its resources and resourcefulness to contain the most powerful and most ruthless aggressor ever to appear among the governments of the earth.

The physical containment has, in large part, succeeded.

It has succeeded, I should say, until now.

Today no responsible man can say or would say continued success of our past policies is assured.

There is now abundant evidence that a pattern of history is repeating. We, like the dynasties of ancient China on down to the Republic of France, have built a wall against aggression, but now we find that we are the imprisoned.

The Soviet has, dramatically, leaped over our wall.

More importantly, we are awakened to the reality that advances of Soviet technology and science have made our wall of security a relic of another age.

Let me cite for you certain specifics, certain facts which all of us, as Americans, must sit down and consider together.

These are not facts of my invention. These are facts testified to by our military leadership coming before the Senate Preparedness Subcommittee, of which I am chairman.

First. The Soviet has under arms nearly as many divisions as do all the free nations combined.

Second. The Soviet air strength is probably close to that of our own.

Third. The Soviet submarine armada now numbers 500, while ours totals only 110.

Fourth. The Soviet shipyards are building 100 new submarines annually, while we are building fewer than 10.

Fifth. The Soviet capacity to launch a one-half ton satellite into space indicates the capacity on their part to launch long-range ballistic missiles against our cities from Soviet soil.

Sixth. The Soviet has now the capacity to launch, from land bases or from its submarines, shorter-range missiles against our installations at home and overseas.

These are military facts. They are important. I would mislead you if I did not say that there are more, more which in time I believe should become public knowledge.

What is the sum of these facts?

The facts of comparative strength between the two strong powers do not add up to disaster—but they do, clearly, total up to peril.

For the moment, the stalemate is not clearly broken. The Soviet striking power is great and growing greater, but our retaliatory power is great also. This the Soviet knows, as we know.

The Soviet however, also knows—as we must come to know—that the rate of growth of their striking power far exceeds ours.

We are behind but we are not yet hopelessly behind. Our peril becomes a disaster when we fall so far behind that there is no hope of recovery. It is to the prevention of that disaster all freemen must now dedicate their efforts.

How is such disaster to be prevented?

Some, looking back to the past, will answer only that the Nation must retool its productive capacity, get ready for a massive effort, and move forward to match the Soviet sputnik for sputnik, missile for missile, sub for sub.

If war were inevitable, I would join in such a call.

But no man who looks beyond the moment will suggest that war is the inevitable consequence of mankind's new adventure into space. I, myself, am confident that it is not.

Space may well be the sea in which the human race will some day find an island of peace.

To reach that island, we need more than weapons.

We need, in fact, to free ourselves of the bonds of a weapon psychology.

Our greatest need in this hour is to unleash the pioneering spirit and the daring and brilliance of our people and set this Nation's course on the pursuit of peace.

We cannot, of course, ignore the need for weapons now.

We need a faster rate of production for our missiles, far faster than any yet permitted or any yet envisioned.

As Prime Minister Churchill told the House of Commons on June 18, 1940:

"If we open a quarrel between the past and the present, we shall find that we have lost the future."

I say that such must be our creed at this hour.

It is with that creed before us that we must proceed, as responsible men, to assess the position of free men in the world today.

I see no gain in picking petty quarrels with the past.

I myself am willing to draw a line at the here and now, and measure responsibility in terms of what is done for the future rather than in terms of what was done in the past.

From this base, I believe we can take a more honest look at the problems we face.

What are those problems? Let me call them as I see them.

First and foremost, I believe that we are paying too high a price for conformity.

Ours has been, always, a Nation built by the greatness of men's hearts and spirits and minds. America's vigor has come from the originality, the freshness, the vision of our people—all our people, not merely an intellectual elite.

For a decade now, we have seen growing a climate of contempt for these values. We are paying a price for that.

Our investigating committee has found, in some most striking examples, that this has been at the heart of some our our preparedness difficulties.

The fight to build for this Nation an atomic submarine is a record of the persistence against great odds of one man. Admiral Rickover, who believed that it could be built. Because he was

more determined to perform than to conform, this brilliant man was—on numerous occasions—shunted into obscurity and his services to the Nation were very nearly lost.

This past few days, in our committee room, I sat 2 feet away from a great Army general and watched him choke back the tears of deep emotion. He told us that his decision to retire from service was final. He said he could not speak freely and he could not support a policy which meant placing American troops in the range of enemy missiles without adequate weapons of defense.

Over and over again. I have heard—and our committee has heard—the leading military men of this Nation come before us and say that a conventional system has cut back on our program for unconventional developments.

Over and over, we have heard them say that we are not, even yet, doing all that we could and should be doing to move forward in this hour of challenge.

This is not the road to strength.

This is not the road America should travel.

We must turn to the dedicated men of vision and welcome them into the councils of respect and dignity.

We must provide a climate in which the men and women of our universities, our research centers, our career services, our world of journalism and communications, can make a full contribution of their talents.

Let me make this point clear.

It is not true that the abilities of Soviet science far exceed those of our American scientists.

As freemen, who respect the freedom of man's mind, we must not allow political policies to chain our most priceless resource.

As we face this problem of removing the fetters from our capacity, we must also remove the fetters of tradition from our policy.

Our defensive strategies, in a military sense, are undergoing reappraisal and reexamination.

It would be a mistake to stop there.

Our foreign policies require the same reappraisal.

So, also, do our domestic policies and values.

We have, for long, held a position of strength in world affairs. That position is no longer secure. We must not be so inflexible that we can imagine no changed policy to cope with a changed position.

Domestically, likewise, each of you as businessmen know that our economy is now undergoing a period of change. This change is not merely a cycle through which we are passing. There are new problems, new challenges arising to the very functioning of our system.

Channels of distribution are undergoing change.

Changes are evident in consumer demand and consumer taste.

Profoundly important population shifts are continuing.

We must not wait for calamity before undertaking a cure.

Just as we erred in our estimate of what Soviet gains might means in the realm of technology, so can we err by complacency in our estimate of what domestic losses might mean in the realm of our economic health.

These things I mention only briefly, to emphasize that in this challenging period we need more, far more, than a purely military response to the Soviet challenge.

We need the marshaling of our resources, physical and mental, such as we have never had before.

We need imagination and freshness.

We need force and boldness in our leadership.

We need, further, I believe, to look beyond the danger evident now to see the horizons of peace in outer space.

I am no scientist and I do not pretend to be.

But the brilliant men of this age—the brillant minds of America—tell us things that we cannot ignore.

Out in space, there is the power to control the earth's weather, to change the climate where we live, to alter the tides and direct the gulf stream on a different course.

From space, snapshots can be taken of your backyard.

The whole technology of communication can be changed.

It is a fascinating, daring, exciting world.

The frontier it opens for human advancement exceeds any man has ever faced.

Surely we cannot, as leaders of freemen, ignore it.

Surely we cannot, with this opportunity before us, fail to see that this affords us the one clear course to recapture the initiative for freedom.

Here is an opportunity to bring men together in common cause as never before.

Here is an opportunity for us to sponsor the flourishing of mankind's genius.

Before this session of Congress ends, I am hopeful that we shall be able to establish in our Government a proper agency for direction of a new national effort in this realm.

I am hopeful, also, that we shall be able to provide a program for the enlargement of our research activities, making the laboratories and the equipment available to draw the best from the minds of our people.

I am hopeful that, furthermore, we shall be able to foster the strengthening of our total educational process, not to produce an army of technicians, but, rather, to pour forth legions of broadly-educated men and women.

As we do these things, I trust that in our relations with other nations we shall be imaginative, and that we shall make it evident that America's free world leadership is not sterile.

We should, certainly, make provisions for inviting together the scientists of other nations to work in concert on projects to extend the frontiers of man and to find solutions to the troubles of this earth.

Our President, holding as he does the esteem of men throughout the world, has a rare opportunity to lead in this labor boldly and forcefully, and in the vigorous pursuit of peace he will find the Nation undivided in his support.

Further, it would be appropriate and fitting for our Nation to demonstrate its initiative before the United Nations by inviting all member nations to join in this adventure into outer space together.

The dimensions of space dwarf our national differences on earth.

If we are to win space as the outpost of peace, all men may—and should—share in that endeavor.

We, with our great resources and our great abilities, must not allow the leadership to slip from our grasp.

The world in which we live is a world in which danger abounds.

There is no greater danger, though, than for us to shrink from the responsibilities of the hour.

Ahead, if we move with speed, if we move with daring, we shall find fulfillment of our quest for peace.

If we are to reach such a goal, our response must begin now. This, more than we realize, is the year of decision, the year our course is set.

In such a year, we need be responsible men, loyal to our nation, faithful to freedom, strangers to partisanship, and friends with the imagination that has been so much a part of our heritage.

THE GOAL IS TOTAL PEACE—EXCERPTS FROM STATEMENTS BY UNITED STATES SENATOR LYNDON B. JOHNSON

ADDRESS IN HOUSTON, TEX., DECEMBER 4, 1957

There is something much bigger and more important in front of us than a few pieces of military hardware. Ballistic missiles and the other fantastic weapons now on the drawing boards are not to be despised.

But they do not hold the key to the future. They are only a small part of the future—a part which will become obsolete almost as soon as it is developed.

What is really before us is something that should have a deep appeal to the American soul. It is a new frontier—a new age—that is exciting and challenging.

What we are doing is stepping into the age of space.

ADDRESS BEFORE MEETING OF DEMOCRATIC CONFERENCE, JANUARY 7, 1958

Within the short weeks since October 4, man has become master of horizons far beyond our imagination. We must respect this mastery, and from that respect we must, more than ever, seek to bring all men together in cooperative effort. The goals now within reach of the human race are too great to be divided as spoils, too great for the world to waste its efforts in a blind race between competitive nations. The conference table is more important now than ever it has been, and we should welcome to its chairs all men of all nations.

ADDRESS BEFORE MEETING OF CBS AFFILIATES, JANUARY 14, 1958

Our greatest need in this hour is to unleash the pioneering spirit and the daring and brilliance of our people and set this Nation's course on the pursuit of peace.

It would be appropriate and fitting for our Nation to demonstrate its initiative before the United Nations by inviting all member nations to join in this adventure into outer space together.

ADDRESS ON THE FLOOR OF THE SENATE, JANUARY 27, 1958

I do, however, have a great deal of faith in efforts to outlaw war when they are accompanied by positive steps to bring people together in cooperation.

When people work together to face a great challenge, they tend to lose their suspicion of each other. They become absorbed in the task before them—and fighting as an instrument of policy fades from the picture.

It is for this reason that I believe the current situation affords us such a great opportunity. There are positive steps which we can take in concert with the other nations of the world to face the great challenge presented by outer space.

ADDRESS ON THE FLOOR OF THE SENATE, FEBRUARY 4, 1958

Our plans for peace must progress jointly and must be as firm as our plans for defense. In other words, this must be a joint effort.

We must not spend all our billions of dollars and make all our plans to fight a war which may never be fought. But in preparing our Nation and in purchasing the implements, the missiles, the planes, and the submarines which may be necessary to prevent a war, we should also have some positive, affirmative plan for peace, to go alongside our preparedness efforts.

Mr. FULBRIGHT. Mr. President, will the Senator yield?

Mr. MANSFIELD. I am delighted to yield.

Mr. FULBRIGHT. This development disturbs me very much. The headline, indicating that the Soviets are taking a suggestion which was made long ago—and I recall particularly the majority leader's statement early in the session about the control of space—and are now using the same ideas as great propaganda, confuses me very much.

[Congressional Record, March 21, 1958]

CANAVERAL CALLED A STUDY IN SPACE-TRAVEL "STONE AGE"

Mr. JOHNSON of Texas. Mr. President, I should like to call to the attention of the Senate a very excellent article written by the distinguished commentator for the New York Herald Tribune, Mr. Roscoe Drummond.

Mr. Drummond has been at Cape Canaveral, the testing range for America's missiles. It seems to me that he has captured in a few words the spirit of the fantastic age which we are entering.

With his usual keen perception, Mr. Drummond has highlighted the rapid progress being made and the potentialities of that progress. He has deftly brought to the forefront the physical facts which put into stark perspective the implications of scientific advance.

As he has pointed out, science is outrunning diplomacy.

[From the New York Herald Tribune of March 21, 1958]

CANAVERAL CALLED A STUDY IN SPACE-TRAVEL "STONE AGE"

(By Roscoe Drummond)

CAPE CANAVERAL, FLA.—After a firsthand look at this fabulous testing center for Army, Navy, and Air Force rockets, missile and satellites, there is only one safe guide for the layman: Believe anything; if it isn't here already, it's just around the corner.

Your first impression of this $100 million "shooting gallery," which stretches from Patrick Air Force Base, the launching site for missiles, across a series of 12 major tracking stations 5,000 miles from the mainland of Florida to Ascension Island in the South Atlantic—is one of precise, minute and massive complexity.

It is so vastly complex, so breathlessly flicking in its mechanical computations and electronic decisions that you can hardly grasp, at first, what Maj. Gen. Donald N. Yates, commander of the Air Force test center, is talking about when he says that in missiles we are only in the advanced Stone Age.

But when you see what lies behind what is happening here at Cape Canaveral and what is going to be happening, you know that General Yates is warning you not to turn your head because tomorrow will be here before you can close your eyes.

Here are some of the reasons:

The rocket capacity is at hand now to put up a 1-ton satellite.

The facilities and components are available today at Cape Canaveral to put a satellite in orbit around the moon 239,000 miles away. And it is harder to put a satellite in orbit around the moon than to strike the moon with an object.

It is now entirely practicable for this center alone to test as many as 900 missiles during the next 12 months. General Yates reports that 3 missiles have been test-launched in a single day here and that this could go on indefinitely.

What you begin to realize is that outer space is coming at us at a terrific speed or vice versa—and that the sputniks, Explorer, and Vanguard are just the horseless carriages of man's travel away from the earth.

Not that there will be no more failures in the testing of missiles and satellites. It wouldn't be surprising to see a dozen United States objects orbiting in outer space in the next year—and some will fall short.

When you view the testing process on the spot you wonder that there haven't been more failures. You realize that the experts are not alibiing when they say that some of the failures, so-called, have been planned—there will be another one soon—in order to determine how much and what kind of punishment a missile can take. The rule here is that any test is a substantial success if the information desired from the test is substantially obtained.

Did I say that the missiles and the testing processes were a little complex? General Yates describes one aspect of it this way: "The electronics system of a guided missile contains at least 12,000 electronic components. It is estimated that a missile has 36,000 to 37,000 items which must function properly if its flight is to be successful. In order to insure satisfactory operation of 3 out of 4

missiles the failure of any single electronic item must be limited to once in about 100,000 items. To make matters more difficult, missiles operate through a range of speeds, acceleration, vibrations, altitudes, and temperatures never before experienced by our engineers."

Telemetering is also quite a feat. This is the principal source of information on what is happening inside missiles. The Cape Canaveral specialists receive a telemetry data on as many as 175 separate functions on each flight, which will yield as many as 250,000 individual readings obtained through telemetry antenna. Such antenna, placed aboard ships at sea especially for the purpose, cover the 5,000-mile trajectory of a ballistic missile.

Cameras photograph twice every second a missile traveling at a speed which would take it from New York to Boston in 45 seconds. All this and related data keep the missiles tracked continuously in flight with no more margin for error than 1 missile length.

Here at Cape Canaveral both weapons and instruments of scientific investigation are going into outer space. According to the letters now going back and forth between Mr. Eisenhower and Mr. Bulganin, both are to be discussed at a summit conference.

The real question is whether man can win control of outer space without losing control of his own destiny.

So far, science is outrunning diplomacy.

[Congressional Record, March 25, 1958]

Appointment of Staff Members of the Senate Special Committee on Space and Astronautics

Mr. Johnson of Texas. Mr. President, for the information of the Senate, I should like to announce that, after consultation with the distinguished ranking minority member of the Senate Special Committee on Space and Astronautics, the senior Senator from New Hampshire [Mr. Bridges], I have made the following appointments to the staff of the committee:

Edwin L. Weisl, of New York, consulting counsel.

Cyrus R. Vance, of New York, consulting counsel.

Dr. Homer Joe Stewart, of California Institute of Technology, scientific consultant.

Mr. Weisl and Mr. Vance served as special counsel and assistant counsel, respectively, during the inquiry by the Senate Armed Services Preparedness Subcommittee into the Nation's satellite and missile programs.

Dr. Stewart, a professor of aeronautics, served as technical consultant during the same inquiry.

Mr. Weisl and Mr. Vance have such heavy commitments that they cannot possibly serve the Space Committee on a full-time basis. But they have agreed to advise and consult with the committee, and the knowledge they gained during the Preparedness Subcommittee investigation will be invaluable.

Dr. Stewart is one of the best informed men in his field. The work he did for the Preparedness Subcommittee was impressive, and we are fortunate that once again he has agreed to offer his services.

BILLS AND RESOLUTIONS INTRODUCED IN THE 85TH CONGRESS, 2D SESSION, THROUGH APRIL 14, 1958, PERTAINING TO OUTER SPACE

Twenty-nine bills and resolutions have been introduced which are concerned with outer space. The first group of bills listed below is concerned with the establishment of congressional committees, for dealing with legislation in this area:

H. R. 9668 (Keating of New York), H. R. 9901 (Boggs of Louisiana), H. R. 9613 (Brooks of Louisiana), House Joint Resolution 489) (Fulton of Pennsylvania), and Senate Concurrent Resolution 53 (Javits): All of these measures would establish a Joint Committee on Outer Space patterned after the Joint Atomic Energy Committee. The first two (H. R. 9668 and H. R. 9901) would establish an 18-man committee while the others would call for 14 men.

Senate Resolution 256 (Johnson): Sets up a special 13-man Space Committee in the Senate. (Passed February 6.)

House Resolution 473 (Coad of Iowa): Identical language as Senate Resolution 256, but setting up a 31-man Space Committee in the House.

House Resolution 474 (Brooks of Louisiana): Same as House Resolution 473 except it calls for a 13-man committee.

House Resolution 496 (McCormack of Massachusetts): Similar to House Resolution 474. (Passed March 5.)

House Resolution 478 (Keating of New York): Amends rule X of the House by establishing an 11-man Committee on Outer Space.

The following bills have been introduced to establish or expand existing agencies for operation of projects concerned with outer space:

H. R. 9874 (Lane of Massachusetts) and H. R. 9966 (Coad of Iowa): These bills are similar and would establish a separate Outer Space Commission patterned after the Atomic Energy Commission.

H. R. 10271 (Durham of North Carolina), H. R. 10352 (Holifield of California), and S. 3117 (Anderson) are identical bills. This proposal would amend the Atomic Energy Act to give the responsibility for outer space development to the Atomic Energy Commission. Authorizes an initial $50 million for this purpose.

S. 3000 (Gore): Contains a provision authorizing and directing the AEC to accelerate existing programs for the development of nuclear rocket propulsion and a "manned vehicle powered by nuclear propulsion and capable of sustained travel outside the earth's atmosphere."

H. R. 11188 (Frelinghuysen of New Jersey) and H. R. 11860 (Fulton of Pennsylvania): Gives the National Advisory Committee on Aeronautics (NACA) the authority to conduct experi-

ments involving outer space and to coordinate the Government's activities in this area. A second title of this bill establishes an 18-man Joint Committee on Astronautics. (See H. R. 9968 above.)

S. 3233 (Yarborough): Authorizes the National Science Foundation to undertake programs in communications and weather modification as they relate to space vehicles.

S. 3604 (Case of South Dakota): Gives the responsibility for development of outer space to the NACA changing its name to the National Astronautics Agency. Governed by a 17-man Board appointed by the President and a Director appointed by the Board.

S. 3609 (Johnson and Bridges, by request), H. R. 11881 (McCormack of Massachusetts), H. R. 11882 (Arends of Illinois), H. R. 11887 (Haskell of Delaware), and H. R. 11888 (Keating of New York): This is the President's bill. (See p. 84.) Gives the responsibility for development of outer space to the NACA changing its name to the National Aeronautics and Space Agency. Governed by a 17-man Board and a Director appointed by the President. The Director consults with the Board but is not bound by their decisions.

Two related bills have been introduced which would establish a new Department of Science.

S. 3126 (Humphrey, McClellan, and Yarborough): Groups together into a new Department of Science and Technology several existing scientific agencies of the Federal Government, such as the Atomic Energy Commission, National Science Foundation, Bureau of Standards, etc. A Government Operations Committee print analysis of the bill, dated March 26, 1958, recommends amendments which would also include the NACA in the new Department and would create standing committees in the House and Senate to handle these matters, including astronautics and space exploration.

S. 3180 (Kefauver): Similar to S. 3126. The Secretary of the new Department of Science would be authorized to carry out programs involving development of outer space.

Two identical resolutions have been offered which would state a policy of Congress concerning outer space.

House Concurrent Resolution 265 (Keating of New York) and House Concurrent Resolution 268 (Hillings of California) would have the Congress express in strongest terms its desire that the regions of outer space be devoted to peaceful purposes through the United Nations or by such other means as may be most appropriate.

Copies of the above bills and resolutions appear below:

85TH CONGRESS
2D SESSION

H. R. 9668

IN THE HOUSE OF REPRESENTATIVES

JANUARY 7, 1958

Mr. KEATING introduced the following bill; which was referred to the Committee on Rules

AND

(also, H. R. 9001, Mr. Boggs)

A BILL

To provide for the establishment of a Joint Committee on Outer Space.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

ESTABLISHMENT AND MEMBERSHIP OF JOINT COMMITTEE

SECTION 1. There is hereby established a Joint Committee on Outer Space (referred to in this Act as the joint committee) to be composed of nine Members of the Senate to be appointed by the President of the Senate, and nine Members of the House of Representatives to be appointed by the Speaker of the House of Representatives. In each instance not more than five Members shall be members of the same political party.

AUTHORITY AND DUTY

SEC. 2. The joint committee shall make continuing studies of the use and control of outer space, giving particular attention to—

(1) the research, development, production, and other activities of any department or agency of the Government, or of any private agency, conducting activities relating to outer space, including such activities relating to rockets, missiles, and earth satellites;

(2) international relations and agreements concerning outer space;

(3) security standards and safeguards with respect to outer space activities;

(4) the control and dissemination of information concerning outer space activities; and

(5) the protection of health and promotion of safety in connection with research, development, and production activities relating to outer space.

Any department or agency of the Government concerned with these matters shall keep the joint committee fully informed with respect to their activities. All bills, resolutions, and other matters in the Senate or the House of Representatives relating primarily to the use and control of outer space shall be referred to the joint committee. The members of the joint committee who are Members of the Senate shall from time to time report to the Senate, and the members of the joint committee who are Members of the House of Representatives shall from time to time report to the House, by bill or otherwise, their recommendations with respect to matters within the jurisdiction of their respective Houses which are referred to the joint committee or otherwise within the jurisdiction of the joint committee.

CHAIRMAN

SEC. 3. Vacancies in the membership of the joint committee shall not affect the power of the remaining members to execute the functions of the joint committee, and shall be filled in the same manner as in the case of the original selection. The joint committee shall select a chairman and a vice chairman

from among its members at the beginning of each Congress. The vice chairman shall act in the place and stead of the chairman in the absence of the chairman. The chairmanship shall alternate between the Senate and the House of Representatives with each Congress, and the chairman shall be selected by the Members from the House entitled to the chairmanship. The vice chairman shall be chosen from the House other than that of the chairman by the Members from that House.

POWERS

SEC. 4. In carrying out its duties under this Act, the joint committee, or any duly authorized subcommittee thereof, is authorized to hold such hearings or investigations, to sit and act at such places and times, to require, by subpena or otherwise, the attendance of such witnesses and the production of such books, papers, and documents, to administer such oaths, to take such testimony, to procure such printing and binding, and to make such expenditures as it deems advisable. The joint committee may make such rules respecting its organization and procedures as it deems necessary: *Provided, however,* That no measure or recommendation shall be reported from the joint committee unless a majority of the committee assent. Subpenas may be issued over the signature of the chairman of this joint committee or by any member designated by him or by the joint committee, and may be served by such person or persons as may be designated by such chairman or member. The chairman of the joint committee or any member thereof may administer oaths to witnesses. The joint committee may use a committee seal. The provisions of sections 102 to 104, inclusive, of the Revised Statutes, as amended, shall apply in case of any failure of any witness to comply with a subpena or to testify when summoned under authority of this section. The expenses of the joint committee shall be paid from the contingent fund of the House of Representatives upon vouchers approved by the chairman or by the vice chairman. Members of the joint committee, and its employees and consultants, while traveling on official business for the joint committee, may receive either the per diem allowance authorized to be paid to Members of Congress or its employees, or their actual and necessary expenses provided an itemized statement of such expenses is attached to the voucher.

STAFF AND ASSISTANCE

SEC. 5. The joint committee is authorized to appoint and fix the compensation of such experts, consultants, technicians, and staff employees as it deems necessary and advisable. The joint committee is authorized to utilize the services, information, facilities, and personnel of the departments and establishments of the Government.

CLASSIFICATION OF INFORMATION

SEC. 6. The joint committee may classify information originating within the committee in accordance with standards used generally by the executive branch for classifying restricted data or defense information.

RECORDS

SEC. 7. The joint committee shall keep a complete record of all committee actions, including a record of the votes on any question on which a record vote is demanded. All committee records, data, charts, and files shall be kept in the offices of the joint committee or other places as the joint committee may direct under such security safeguards as the joint committee shall determine to be in the interest of the national defense and security.

85TH CONGRESS
2D SESSION

H. R. 9613

IN THE HOUSE OF REPRESENTATIVES

JANUARY 7, 1958

Mr. Brooks of Louisiana introduced the following bill; which was referred to the Committee on Rules

A BILL

To provide for the establishment of a joint committee to study the problems relating to the navigation, use, and control of outer space

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

ESTABLISHMENT OF THE JOINT COMMITTEE ON PROBLEMS RELATING TO THE NAVIGATION, USE, AND CONTROL OF OUTER SPACE

SECTION 1. There is hereby established a joint committee to be known as the Joint Committee on Problems Relating to the Navigation, Use, and Control of Outer Space (referred to in this Act as the "committee").

MEMBERSHIP

SEC. 2. The committee shall be composed of seven Members of the Senate to be appointed by the President of the Senate, and seven Members of the House of Representatives to be appointed by the Speaker of the House of Representatives. In each instance not more than four Members shall be members of the same political party.

AUTHORITY AND DUTIES

SEC. 3. The committee shall make continuing studies of the activities of the various Government departments, services, and commissions, and the activities of private agencies, relating to the development, use, and control of guided missiles, ballistic missiles, earth satellites, and other mechanisms designed for the navigation of outer space, and shall make continuing studies of the problems relating to the navigation, use, and control of outer space and the conditions beyond present human navigational air limits. The Department of Defense shall keep the committee fully and currently informed with respect to all matters within the jurisdiction of the Department of Defense relating to the fields of guided missiles, ballistic missiles, earth satellites, and other mechanisms designed for the navigation of outer space, and other problems relating to the navigation, use, and control of outer space. Any Government agency shall furnish any information requested by the committee with respect to the activities or responsibilities of that agency in such fields. All bills, resolutions, or other matters in the Senate or the House of Representatives, relating primarily to the development, use, or control of guided missiles, ballistic missiles, earth satellites, and other mechanisms designed for the navigation of outer space, and other problems relating to the navigation, use, or control of outer space, shall be referred to the committee. The members of the committee who are Members of the Senate shall from time to time report to the Senate, and the members of the committee who are Members of the House of Representatives shall from time to time report to the House, by bill or otherwise, their recommendations with respect to matters within the jurisdiction of their respective Houses which are referred to the committee or are otherwise within the jurisdiction of the committee.

CHAIRMAN

SEC. 4. Vacancies in the membership of the committee shall not affect the power of the remaining members to execute the functions of the committee, and shall be filled in the same manner as in the case of the original selection. The committee shall select a chairman and a vice chairman from among its members at the beginning of each Congress. The vice chairman shall act in the place and stead of the chairman in the absence of the chairman. The chairmanship shall alternate between the Senate and the House of Representatives with each Congress, and the chairman shall be selected by the Members from that House entitled to the chairmanship. The vice chairman shall be chosen from the House other than that of the chairman by the Members from that House.

POWERS

SEC. 5. In carrying out its duties under this Act, the committee, or any duly authorized subcommittee thereof, is authorized to hold such hearings or investigations, to sit and act at such places and times, to require, by subpena or otherwise, the attendance of such witnesses and the production of such books, papers, and documents, to administer such oaths, to take such testimony, to procure such printing and binding, and to make such expenditures as it deems advisable. The committee may make such rules respecting its organization and procedures as it deems necessary, but no measure or recommendation shall be reported from the committee unless a majority of the committee assent. Subpenas may be issued over the signature of the chairman of the committee or by any member designated by him or by the committee, and may be served by such person as may be designated by such chairman or member. The chairman of the committee or any member thereof may administer oaths to witnesses. The provisions of sections 102 to 104, inclusive, of the Revised Statutes of the United States (2 U. S. C. 192-194), shall apply in case of the failure of any witness to comply with a subpena or to testify when summoned under authority of this section. The expenses of the committee shall be paid from the contingent fund of the House upon vouchers approved by the chairman. Members of the committee, and its employees and consultants, while traveling on official business for the committee, may receive either the per diem allowance authorized to be paid to Members of Congress or its employees, or their actual and necessary expenses if an itemized statement of such expenses is attached to the voucher.

STAFF AND ASSISTANTS

SEC. 6. The committee may appoint and fix the compensation of such experts, consultants, technicians, and staff employees as it deems necessary and advisable. The committee is authorized to utilize the services, information, facilities, and personnel of the departments and establishments of the Government.

CLASSIFICATION OF INFORMATION

SEC. 7. The committee may classify information originating within the committee in accordance with standards used generally by the executive branch of the Government for classifying restricted data or defense information.

RECORDS

SEC. 8. The committee shall keep a complete record of all committee actions, including a record of the votes on any question on which a record vote is demanded. All committee records, data, charts, and files shall be the property of the committee and shall be kept in the offices of the committee, or such other places as the committee may direct, under such security safeguards as the committee shall determine to be in the interest of the common defense and security.

85TH CONGRESS

2D SESSION

S. CON. RES. 53

IN THE SENATE OF THE UNITED STATES

JANUARY 9, 1958

Mr. JAVITS submitted the following concurrent resolution; which was referred to the Committee on Armed Services

(also, H. J. Res. 480, Mr. Fulton, referred to Committee on Rules)

85TH CONGRESS

2D SESSION

JOINT RESOLUTION

Whereas the development of successful earth satellites and high altitude rockets capable of supersonic speeds by remote control is a reality, and the problems of outer space and the many ramifications of this area have opened a new field whose impact on our civilization shows tremendous capabilities for good or for ill; and

Whereas the necessity is apparent for the United States to maintain leadership in developing outer space so that the tremendous gains to come in this field may be advances for peace; and

Whereas freedom of navigation in outer space is as vital as freedom of the seas; and

Whereas claims may be made and questions of international law arise as to rights in outer space and to celestial bodies; and

Whereas for the protection of the general welfare and security of the United States and the free world there is need for a joint and continuing comprehensive study and congressional oversight in these fields: Now, therefore, be it

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby established a Joint Committee on Earth Satellites and the Problems of Outer Space.

SEC. 2 AUTHORITY AND DUTIES.—The joint committee shall make continuing studies of the activities of the various government departments, services, and commissions, and of private and international agencies relating to the development, use, and control of earth satellites and similar mechanisms, and shall make continuing studies of the problems of outer space and conditions beyond present human navigational air limits and claims to celestial bodies therein. The Department of Defense shall keep the joint committee fully and currently informed with respect to all matters within the Department of Defense relating to the fields of earth satellites and outer space. Any government agency shall furnish any information requested by the joint committee with respect to the activities or responsibilities of that agency in the field of earth satellites and outer space. All bills, resolutions, or other matters in the Senate or the House of Representatives, relating primarily to the development, use, or control of the earth satellites and outer space shall be referred to the joint committee.

SEC. 3. MEMBERSHIP.—The joint committee shall be composed of seven Members of the Senate to be appointed by the President of the Senate, and seven Members of the House of Representatives to be appointed by the Speaker of the House of Representatives. In each instance not more than four members shall be members of the same political party. The members of the joint committee who are Members of the Senate shall from time to time report to the Senate, and the members of the joint committee who are Members of the House of Representatives shall from time to time report to the House of Representatives, by bill or otherwise, their recommendations with respect to matters within the jurisdiction of their respective houses which are referred to the joint committee, or are otherwise within the jurisdiction of the joint committee.

SEC. 4. CHAIRMAN AND VACANCIES.—The joint committee shall select a chairman and a vice chairman from among its members at the beginning of each Congress. The vice chairman shall act in the place and stead of the chairman in the absence of the chairman. The chairmanship shall alternate between the Senate and the House of Representatives with each Congress, and the chairman shall be selected by the members from the House entitled to the chairmanship. The vice chairman shall be chosen from the House other than that of the chairman, by the members from that House.

Vacancies in the membership of the joint committee shall not affect the power of the remaining members to execute the functions of the joint committee, and shall be filled in the same manner as in the case of the original selection.

SEC. 5. POWERS.—The joint committee may make such rules respecting its organization and procedures as it deems necessary: *Provided, however,* That no measure or recommendation shall be reported from the joint committee unless a majority of the committee assent.

In carrying out its duties under this Act, the joint committee or any authorized subcommittee thereof, is authorized to hold such hearings or investigations, to sit and act at such places and times, to require, by subpena or otherwise, the attendance of such witnesses and the production of such books, papers, and documents, to administer such oaths, to take such testimony, to procure such printing and binding, and to make such expenditures as it deems advisable.

Subpenas may be issued over the signature of the chairman of the joint committee, or by any member designated by him or by the joint committee, and may be served by such person or persons as may be designated by such chairman or member. The chairman of the joint committee or any member thereof may administer oaths to witnesses. The provisions of sections 102 to 104, inclusive, of the Revised Statutes, as amended, shall apply in case of any failure of any witnesses to comply with a subpena or to testify when summoned under authority of this section.

The expenses of the joint committee shall be paid from the contingent fund of the House of Representatives from funds appropriated for the joint committee, upon vouchers approved by the chairman.

SEC. 6. STAFF AND ASSISTANCE.—The joint committee is empowered to appoint and fix the compensation of such experts, consultants, technicians, and staff employees as it deems necessary and advisable. The joint committee is authorized to utilize the services, information, facilities, and personnel of the departments and establishments of the Government.

Members of the joint committee, and its employees and consultants, while traveling on official business for the joint committee, may receive either the per diem allowance authorized to be paid to Members of Congress or its employees, or their actual and necessary expenses, provided an itemized statements of such expenses is attached to the voucher.

The cost of stenographic services shall not be in excess of the amounts prescribed by law for reporting the hearings of standing committees of the House of Representatives. The cost of stenographic service to report executive hearings shall be fixed at an equitable rate by the joint committee.

SEC. 7. CLASSIFICATION OF INFORMATION.—The joint committee may classify information originating within the committee in accordance with standards used generally by the executive branch for classifying restricted data or defense information.

SEC. 8. RECORDS.—The joint committee shall keep a complete record of all committee actions, including a record of the votes on any question on which a record vote is demanded. All committee records, data, charts, and files shall be the property of the joint committee and shall be kept in the offices of the joint committee or other places as the joint committee may direct under such security as the joint committee shall determine in the interests of the common defense and security.

85TH CONGRESS
2D SESSION

S. RES. 256

IN THE SENATE OF THE UNITED STATES

FEBRUARY 5, 1958

Mr. JOHNSON of Texas (for himself, Mr. KEFAUVER, Mr. STENNIS, Mr. SYMINGTON, Mr. BRIDGES, Mr. SALTONSTALL, and Mr. FLANDERS) submitted the following resolution; which was referred to the Committee on Rules and Administration

FEBRUARY 5, 1958

Reported by Mr. HENNINGS, with an amendment

FEBRUARY 6, 1958

Considered, amended, and agreed to

RESOLUTION

Resolved, That there is hereby established a special committee which is authorized and directed to conduct a thorough and complete study and investigation with respect to all aspects and problems relating to the exploration of outer space and the control, development, and use of astronautical resources, personnel, equipment, and facilities. All bills and resolutions introduced in the Senate, and all bills and resolutions from the House of Representatives, proposing legislation in the field of astronautics and space exploration shall be referred, and if necessary rereferred, to the special committee. The special committee is authorized and directed to report to the Senate by June 1, 1958, or the earliest practical date thereafter, but not later than January 31, 1959, by bill or otherwise, with recommendations upon any matters covered by this resolution.

SEC. 2. (a) The special committee shall consist of thirteen members, seven from the majority and six from the minority Members of the Senate, to be appointed by the Vice President from the Committees on Appropriations, Foreign Relations, Armed Services, Interstate and Foreign Commerce, Government Operations, and the Joint Committee on Atomic Energy. At its first meeting to be called by the Vice President, the special committee shall select a chairman.

(b) Any vacancies shall be filled in the same manner as the original appointments.

SEC 3. For the purposes of this resolution the special committee is authorized as it may deem necessary and appropriate to (1) make such expenditures from the contingent fund of the Senate; (2) hold such hearings; (3) sit and act at such times and places during the sessions, recesses, and adjournment periods of thte Senate; (4) require by subpena or otherwise the attendance of such witnesses and production of such correspondence, books, papers, and documents; (5) administer such oaths; (6) take such testimony, either orally or by deposition; (7) employ on a temporary basis such technical, clerical, and other assistants and consultants; and (8) with the prior consent of the executive department or agency concerned and the Committee on Rules and Administration, employ on a reimbursable basis such executive branch personnel as it deems advisable; and further with the consent of other committees or subcommittees, to work in conjunction with and utilize their staffs, as it shall be deemed necessary and appropriate in the judgment of the chairman of the special committee.

SEC. 4. Upon the filing of its final report, the special committee shall cease to exist.

SEC. 5. The expenditures authorized by this resolution shall not exceed $50,000 and shall be paid upon vouchers signed by the chairman of the special committee.

85TH CONGRESS

2D SESSION

H. RES. 473

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 6, 1958

Mr. COAD submitted the following resolution; which was referred to the Committee on Rules

RESOLUTION

Resolved, That there is hereby established a special committee which is authorized and directed to conduct a thorough and complete study and investigation with respect to all aspects and problems relating to the exploration of outer space and the control, development, and use of astronautical resources, personnel, equipment, and facilities. All bills and resolutions introduced in the House of Representatives proposing legislation in the field of astronautics and space exploration shall be referred, and if necessary re-referred, to the special committee. The special committee is authorized and directed to report to the House of Representatives by June 1, 1958, or the earliest practical date thereafter, but not later than January 31, 1959, by bill or otherwise, with recommendations upon any matters covered by this resolution.

SEC. 2. (a) The special committee shall consist of thirty-one members, seventeen from the majority and fourteen from the minority Members of the House of Representatives to be appointed by the Speaker with at least three members from each of the following committees: The Committees on Appropriations, Foreign Affairs, Armed Services, Interstate and Foreign Commerce, Government Operations, and the Joint Committee on Atomic Energy. Other members shall be appointed without regard to previous committee assignments. At the first meeting, to be called by the Speaker, the special committee shall select a chairman.

(b) Any vacancies shall be filled in the same manner as the original appointments.

SEC. 3. For the purposes of this resolution the special committee is authorized, as it may deem necessary and appropriate, to (1) make such expenditures from the contingent fund of the House of Representatives; (2) hold such hearings; (3) sit and act at such times and places during the sessions, recesses, and adjournment periods of the House of Representatives; (4) require by subpena or otherwise the attendance of such witnesses and production of such correspondence, books, papers, and documents; (5) administer such oaths; (6) take such testimony, either orally or by deposition; (7) employ on a temporary basis such technical, clerical, and other assistants and consultants; and (8) with the prior consent of the executive department or agency concerned and the Committee on Rules and Administration, employ on a reimbursable basis such executive branch personnel as it deems advisable; and further with the consent of other committees or subcommittees, to work in conjunction with and utilize their staffs, as it shall be deemed necessary and appropriate in the judgment of the chairman of the special committee.

SEC. 4. Upon the filing of its final report, the special committee shall cease to exist.

SEC. 5. The expenditures authorized by this resolution shall not exceed $50,000 and shall be paid upon vouchers signed by the chairman of the special committee.

85TH CONGRESS
2D SESSION

H. RES. 474

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 10, 1958

Mr. BROOKS of Louisiana submitted the following resolution; which was referred to the Committee on Rules

(Same as H. Res. 473, except that H. Res. 474 calls for thirteen Members.)

85TH CONGRESS
2D SESSION

H. RES. 478

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 18, 1958

Mr. KEATING submitted the following resolution; which was referred to the Committee on Rules

RESOLUTION

Resolved, That rule X of the Rules of the House of Representatives is amended—

(1) by inserting immediately after paragraph (m) the following new paragraph:

"(n) Committee on Outer Space, to consist of eleven members."

(1) by redesignating existing paragraphs (n), (o), (p), (q), (r), and (s) as (o), (p), (q), (r), (s), and (t), respectively.

SEC. 2. That rule XI of the Rules of the House of Representatives is amended—

(2) by redesigning existing paragraphs (n), (o), (p), (q), (r), and

"14. Committee on Outer Space.

"(a) Outer space generally.

"(b) The research, development, production, and other activities of any department or agency of the Government, or of any private agency, conducting activities relating to outer space, including such activities relating to rockets, missiles, and earth satellites.

"(c) International relations and agreements concerning legal, jurisdictional, communications, navigation, and other matters concerning the use and control of outer space.

"(d) Security standards and safeguards with respect to outer space activities.

"(e) The control and dissemination of information concerning outer space activities.

"(f) The protection of health and promotion of safety in connection with research, development, and production activities relating to outer space."

(2) by redesignating existing clauses 14, 15, 16, 17, 18, and 19 as 15, 16, 17, 18, 19, and 20, respectively.

85TH CONGRESS

2D SESSION

H. RES. 496

IN THE HOUSE OF REPRESENTATIVES

MARCH 5, 1958

Mr. MCCORMACK submitted the following resolution; which was considered and agreed to

RESOLUTION

Resolved, That there is hereby created a Select Committee on Astronautics and Space Exploration to be composed of thirteen Members of the House of Representatives to be appointed by the Speaker, seven from the majority party and six from the minority party, one of whom he shall designate as chairman. Any vacancy occurring in the membership of the committee shall be filled in the manner in which the original appointment was made.

The select committee is authorized and directed to conduct a thorough and complete study and investigation with respect to all aspects and problems relating to the exploration of outer space and the control, development, and use of astronautical resources, personnel, equipment, and facilities. All bills and resolutions introduced in the House, and all bills and resolutions from the Senate, proposing legislation in the field of astronautics and space exploration shall be referred to the select committee. The select committee is authorized and directed to report to the House by June 1, 1958, or the earliest practical date thereafter, but not later than January 3, 1959, by bill or otherwise, with recommendations upon any matters covered by this resolution.

For the purposes of this resolution the select committee, or any subcommittee thereof, is authorized to sit and act during the present Congress at such times and places whether or not the House has recessed or has adjourned, to hold such hearings, to require the attendance of such witnesses and the production of such books, papers, and documents, and to take such testimony, as it deems necessary. Subpenas may be issued under the signature of the chairman of the committee or any properly designated chairman of a subcommittee, or any member designated by him, and may be served by any person designated by such chairman or member. The chairman of the committee or any member thereof may administer oaths to witnesses.

85TH CONGRESS

2D SESSION

H. R. 9847

IN THE HOUSE OF REPRESENTATIVES

JANUARY 8, 1958

Mr. LANE introduced the following bill; which was referred to the Committee on Armed Services

A BILL

To establish a Commission on Outer Space for the purpose of promoting the development and use of rockets, missiles, satellites, and spaceships, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "Outer Space Commission Act of 1958".

DECLARATION OF POLICY

SEC. 2. Rockets, missiles, satellites, and space ships are capable of application for peaceful as well as military purposes. It is the policy of the Congress that—

(1) the development, manufacture, use, and control of rockets, missiles, satellites, and spaceships should be directed so as to make the maximum contribution to the general welfare, subject at all times to the paramount objective of making the maximum contribution to the common defense and security; and

(2) the development, manufacture, use, and control of rockets, missiles, satellites, and spaceships should be directed so as to promote world peace, improve the general welfare, increase the standard of living, and strengthen free competition in private enterprise.

FINDINGS

SEC. 3. The Congress hereby makes the following findings concerning the development, manufacture, use, and control of rockets, missiles, satellites, and spaceships:

(1) The development, manufacture, use, and control of rockets, missiles, satellites, and spaceships for military and all other purposes are vital to the common defense and security.

(2) Such development, manufacture, use, and control should be regulated in the national interest in order to provide for the common defense and security and to protect the health and safety of the public.

(3) Funds of the United States should be provided for the development, manufacture, use, and control of rockets, missiles, satellites, and spaceships under conditions which will provide for the common defense and security and promote the general welfare.

PURPOSE

SEC. 4. It is the purpose of this Act to carry out the policy set forth in section 2 of this Act by providing for—

(1) a program of conducting, assisting, and fostering research and development in order to encourage maximum scientific, educational, and industrial progress;

(2) a program for the dissemination of unclassified scientific and technical information and for the control, dissemination, and declassification of restricted data, subject to appropriate safeguards, so as to encourage scientific, educational, and industrial progress;

(3) a program to encourage widespread participation in the development, manufacture, use, and control of rockets, missiles, satellites, and spaceships for peaceful purposes to the maximum extent consistent with the common defense and security and with the health and safety of the public;

(4) a program of international cooperation to promote the common defense and security and to make available to cooperating nations the benefits of peaceful application of rockets, missiles, satellites, and spaceships as widely as expanding technology and considerations of the common defense and security will permit; and

(5) a program of administration which will be consistent with the foregoing policies and programs, with international arrangements, and with agreements for cooperation, and which will enable the Congress to be currently informed with respect to the administration of this Act so as to take such further legislative action as may be appropriate.

DEFINITIONS

SEC. 5. As used in this Act—

(1) the term "agreement for cooperation" means any agreement with another nation or regional defense organization made pursuant to section 16;

(2) the term "Commission" means the Commission on Outer Space;

(3) the term "common defense and security" means the common defense and security of the United States;

(4) the term "defense information" means any information in any category determined by any Government agency authorized to classify information as being information respecting, relating to, or affecting the national defense;

(5) the term "design" means (A) specifications, plans, drawings, blueprints, and other items of like nature; (B) the information contained therein; and (C) the research and development data pertinent to the information contained therein;

(6) the term "Government agency" means any executive department, commission, independent establishment, corporation (wholly or partly owned by the United States which is an instrumentality of the United States), or any board, bureau, division, service, office, officer, authority, administration, or other establishment in the executive branch of the Government;

(7) the term "international arrangement" means any international agreement approved by the Congress after the date of enactment of this Act, or any treaty, during the time such agreement or treaty is in full force and effect, but does not include any agreement for cooperation;

(8) the term "research and development" means (A) theoretical analysis, exploration, or experimentation; and (B) the extension of investigative findings and theories of a scientific or technical nature into practical application for experimental and demonstrational purposes, including the experimental production and testing of models, devices, equipment, materials, and processes;

(9) the term "restricted data" means all data concerning (A) design, manufacture, use, or control of rockets, missiles, satellites, and spaceships designed for military application, and (B) such other information relating to rockets, missiles, satellites, and spaceships as the Commission shall prescribe; and

(10) the term "United States", when used in a geographical sense, includes the several States, Territories, and possessions of the United States, the Commonwealth of Puerto Rico, and the District of Columbia.

ESTABLISHMENT OF COMMISSION

SEC. 6. There is hereby established a Commission on Outer Space to be composed of five members, each of whom shall be a citizen of the United States. The President shall designate one member of the Commission as Chairman thereof to serve as such during the pleasure of the President. The Chairman may from time to time designate any other member of the Commission as Acting Chairman to act in the place and stead of the Chairman during his absence. The Chairman (or the Acting Chairman in the absence of the Chairman) shall preside at all meetings of the Commission and a quorum for the transaction of business shall consist of at least three members present. Each member of the Commission, including the Chairman, shall have equal responsibilities and authority in all decisions and actions of the Commission and shall have one vote. Action of the Commission shall be determined by a majority vote of the members present. The Chairman (or the Acting Chairman in the absence of the Chairman) shall be the official spokesman of the Commission in its relations with the Congress, Government agencies, persons, or the public, and, on behalf of the Commission, shall see to the faithful execution of the policies and decisions of the Commission, and shall report thereon to the Commission from time to time or as the Commission may direct. The Commission shall have an official seal which shall be judicially noticed.

MEMBERSHIP OF COMMISSION; TERM OF OFFICE; COMPENSATION

SEC. 7. (a) Members of the Commission shall be appointed by the President, by and with the advice and consent of the Senate. In submitting any nomination to the Senate, the President shall set forth the experience and qualifications of the nominee. The term of office of each member of the Commission shall be five years, except that of the members first appointed one shall be appointed for a term of one year, one for a term of two years, one for a term of three years, one for a term of four years, and one for a term of five years. Any appointed to fill a vacancy occurring before the expiration of the term for which his predecessor was appointed, shall be appointed for the remainder of such term. Any member of the Commission may be removed by the President for inefficiency, neglect of duty, or malfeasance in office. Each member, except the Chairman, shall receive compensation at the rate of $18,000 per annum; and the member designated as Chairman shall receive compensation at the rate of $20,000 per annum.

(b) No member of the Commission shall engage in any business, vocation, or employment, other than that of serving as a member of the Commission.

PRINCIPAL OFFICE OF COMMISSION

SEC. 8. The principal office of the Commission shall be in or near the District of Columbia, but the Commission or any duly authorized representative may exercise any or all of its powers in any place; however, the Commission shall maintain an office for the service of process and papers within the District of Columbia.

GENERAL MANAGER

SEC. 9. There is hereby established within the Commission a General Manager, who shall discharge such administrative and executive functions of the Commission as the Commission may direct. The General Manager shall be appointed by the Commission, shall serve at the pleasure of the Commission, shall be removable by the Commission, and shall receive compensation at a rate determined by the Commission, but not in excess of $20,000 per annum.

DIVISIONS WITHIN COMMISSION; DIRECTORS

SEC. 10. There is hereby established within the Commission—

(1) a Division of Military Application, and such other program divisions (not to exceed ten in number) as the Commission may determine to be necessary to the discharge of its responsibilities, including a division or divisions the primary responsibilities of which include the development and application for civilian uses of rockets, missiles, satellites, and spaceships. Each such division shall be under the direction of a Director who shall be appointed by the Commission and shall receive compensation at a rate determined by the Commission, but not in excess of $16,000 per annum. The Director of the Division of Military Application shall be an active member of the Armed Forces. The Commission shall require each such division to exercise such of its administrative and executive powers as the Commission may determine;

(2) an Office of the General Counsel under the direction of the General Counsel who shall be appointed by the Commission and shall receive compensation at a rate determined by the Commission, but not in excess of $16,000 per annum; and

(3) an Inspection Division under the direction of a Director who shall be appointed by the Commission and shall receive compensation at a rate determined by the Commission, but not in excess of $16,000 per annum. The Inspection Division shall be responsible for gathering information to show whether or not the contractors and officers and employees of the Commission are complying with the provisions of this Act and the appropriate rules and regulations of the Commission.

GENERAL ADVISORY COMMITTEE

SEC. 11. There shall be a General Advisory Committee to advise the Commission on scientific and technical matters relating to rocket technology and space flight to be composed of nine members, appointed from private life by the President. The term of office of each member shall be six years, except that of the members first appointed three shall be appointed for a term of two years, three for a term of four years, and three for a term of six years. Any member appointed to fill a vacancy occurring before the expiration of the term for which his predecessor was appointed, shall be appointed for the remainder of such term. The Committee shall designate one of its own members as Chairman. The Committee shall meet at least four times in every calendar year. The members of the Committee shall receive compensation at the rate of $50 per diem for each day spent in meetings or conferences, and shall receive necessary traveling or other expenses incurred by them while engaged in the work of the Committee.

MILITARY LIAISON COMMITTEE

SEC. 12. (a) There is hereby established a Military Liaison Committee consisting of—

(1) a Chairman, who shall be the head thereof and who shall be appointed by the President, by and with the advice and consent of the Senate, who shall serve at the pleasure of the President, and who shall receive compensation at the rate prescribed for an Assistant Secretary of Defense; and

(2) a representative or representatives from each of the Departments of the Army, Navy, and Air Force, in equal numbers as determined by the Secretary of Defense, to be assigned from each Department by the Secretary thereof, and who shall serve without additional compensation.

The Chairman of the Committee may designate one of the members of the Committee as Acting Chairman to act during his absence. The Commission shall advise and consult with the Department of Defense, through the Committee, on all scientific and technological matters coming under the authority of the Commission which the Department of Defense deems related to military applications of rocket technology and space flight, including the development, manufacture, use, and storage of rockets, missiles, satellites, and spaceships, and the control of information relating to such development and manufacture; and shall, through the Committee, keep the Department of Defense fully and currently informed on all such matters before the Commission. The Department of Defense shall, through the Committee, keep the Commission fully and currently informed on all matters within the Department of Defense which the Commission deems related to the development or application of rocket technolo and space flight. The Department of Defense, through the Committee, shal ve the authority to make written recommendations to the Commission f me to time on matters relating to military applications of rocket techn and space flight as the Department of Defense may deem appropriate. If partment of Defense at any time concludes that any request, action, pr ction, or failure to act, on the part of the Commission is adverse to th sibilities of the Department of Defense, the Secretary of Defense shall the matter to the President whose decision shall be final.

(b) Notwithstanding the provisions of any other law, active officer of the Army, Navy, or Air Force may serve as Director of the Division of Military Application without prejudice to his commissioned status as such officer. Any such officer serving as Director of the Division of Military Application shall, in addition to his pay and allowances (including special and incentive pays) receive an amount equal to the difference between such pay and allowances (including special and incentive pays), and the compensation prescribed in subsection (a) of this section. Notwithstanding the provisions of any other law, an active or retired officer of the Army, Navy, or Air Force may serve as Chairman of the Military Liaison Committee without prejudice to his active or retired status as such officer. Any such officer serving as Chairman of the Military Liaison Committee shall, in addition to his pay and allowances (including special and incentive pays), or retired pay, receive an amount equal to the difference between such pay and allowances (including special and incentive pays), or retired pay, and the compensation prescribed for the Chairman of the Military Liaison Committee.

RESEARCH

SEC. 14. (a) The Commission shall exercise its powers in such manner as to insure the continued conduct of research and development activities in the fields specified by this Act, by private or public institutions or persons, and to assist in the acquisition of an ever-expanding fund of theoretical and practical knowledge in such fields. To this end the Commission is authorized and directed to make arrangements (including contracts, agreements, and loans) for the conduct of research and development activities relating to—

(1) rockets;
(2) missiles;
(3) satellites;
(4) spaceships;
(5) the protection of health and the promotion of safety during such research and development activities; and
(6) the advancement of scientific and technical education in the United States in order to provide an adequate supply of trained personnel for the conduct of such research and development activities.

(b) The Commission may—

(1) make arrangements pursuant to this section, without regard to the provisions of section 3709 of the Revised Statutes of the United States, as amended (41 U. S. C. 5), upon certification by the Commission that such action is necessary in the interest of the common defense and security, or upon a showing by the Commission that advertising is not reasonably practicable;
(2) make partial and advance payments under such arrangements; and

(3) make available for use in connection therewith such of its equipment and facilities as it may deem desirable.

(c) The arrangements made pursuant to this section shall contain such provisions as the Commission may determine to be necessary to—

(1) protect health;

(2) minimize danger to life or property; and

(3) require the reporting, and permit the inspection, of work performed thereunder.

No such arangement shall contain any provision or condition preventing the dissemination of scientific or technical information, except to the extent such dissemination is prohibited by law.

(d) The Commission may conduct, through its own facilities, activities and studies of the types specified in this section.

(e) Where the Commission finds private facilities or laboratories inadequate for studies of the types specified in this section, it is authorized to conduct for other persons, through its own facilities, such of those activities and studies as it deems appropriate to the development of rocket technology and space flight. The Commission is authorized to determine and make such charges as it may deem desirable for the conduct of such activities and studies.

MILITARY APPLICATION

SEC. 15. (a) The Commission is authorized to—

(1) conduct experiments and do research and development work in the military application of rockets, missiles, satellites, and space ships; and

(2) engage in the production of rockets, missiles, satellites, and spaceships, except that such activities shall be carried on only to the extent that the express consent and direction of the President of the United States has been obtained, which consent and direction shall be obtained at least once each year.

(b) The President may, from time to time, direct the Commission (1) to deliver such quantities of rockets, missiles, satellites, and spaceships, developed and produced by the Commission, to the Department of Defense for such use as he deems necessary in the interest of national defense, or (2) to authorize the Department of Defense to manufacture, produce, or acquire any rocket, missile, satellite, or space ship for military purposes.

INTERNATIONAL ACTIVITIES

SEC. 16. (a) Any provision of this Act or any action of the Commission to the extent and during the time that it conflicts with the provisions of any international arrangement made after the date of enactment of this Act shall be deemed to be of no force or effect.

(b) In the performance of its functions under this Act, the Commission shall give maximum effect to the policies contained in any international arrangement made after the date of enactment of this Act.

(c) No cooperation with any nation or regional defense organization pursuant to section 19 shall be undertaken until—

(1) the Commission or, in the case of those agreements for cooperation arranged pursuant to subsection (b) of section 19, the Department of Defense has submitted to the President the proposed agreement for cooperation, together with its recommendation thereon, which proposed agreement shall include (A) the terms, conditions, duration, nature, and scope of the cooperation; (B) a guaranty by the cooperating party that security safeguards and standards as set forth in the agreement for cooperation will be maintained; (C) a guaranty by the cooperating party that any material to be transferred pursuant to such agreement will not be used for any military purpose, except as specified in the agreement for cooperation; and (D) a guaranty by the thorized persons or beyond the jurisdiction of the cooperating party, except pursuant to the agreement for cooperation will not be transferred to unauthorized persons or beyond the jurisdiction of the cooperating party, except as specified in the agreement for cooperation; and

(2) the President has approved and authorized the execution of the proposed agreement for cooperation, and has made a determination in writing that the performance of the proposed agreement will promote and will not constitute an unreasonable risk to the common defense and security.

(d) The President is authorized to enter into an international arrangement with a group of nations providing for international cooperation in the nonmilitary applications of rockets, missiles, satellites, and spaceships, and he may thereafter cooperate with that group of nations pursuant to subsection (a) of section 19. Such cooperation shall be undertaken pursuant to an agreement for cooperation entered into in accordance with this section.

CONTROL OF INFORMATION

SEC. 17. (a) It shall be the policy of the Commission to control the dissemination and declassification of restricted data in such a manner as to assure the common defense and security. Consistent with such policy, the Commission shall be guided by the following principles:

(1) Until effective and enforceable international safeguards against the use of rockets, missiles, satellites, and spaceships for destructive purposes have been established by an international arrangement, there shall be no exchange of restricted data with other nations, except as authorized by section 19; and

(2) The dissemination of scientific and technical information relating to rockets, missiles, satellites, and spaceships should be permitted and encouraged so as to provide that free interchange of ideas and criticism which is essential to scientific, educational, and industrial progress and public understanding and to enlarge the fund of technical information.

(b) The Commission shall, from time to time, determine the restricted data which can be published without undue risk to the common defense and security and shall cause such data to be declassified and removed from the category of restricted data.

(c) The Commission shall maintain a continuous review of restricted data, and of any classification guides issued for the guidance of those engaged in activities connected with the development and use of rockets, missiles, satellites, and spaceships, including research in connection therewith, with respect to the areas of restricted data which have been declassified in order to determine what information may be declassified and removed from the category of restricted data without undue risk to the common defense and security.

(d) In the case of restricted data which the Commission and the Department of Defense jointly determine to relate primarily to the utilization of rockets, missiles, satellites, and spaceships for military purposes, the determination that such data may be published without constituting an unreasonable risk to the common defense and security shall be made by the Commission and the Department of Defense jointly, and if the Commission and the Department of Defense do not agree, the determination shall be made by the President.

(e) The Commission shall remove from the restricted data category such data as the Commission and the Department of Defense jointly determine to relate primarily to the utilization of rockets, missiles, satellites, and spaceships for military purposes, and which the Commission and the Department of Defense jointly determine can be adequately safeguarded as defense information. No such data so removed from the restricted data category shall be transmitted or otherwise made available to any nation or regional defense organization while such data remains defense information, except pursuant to an agreement for cooperation entered into in accordance with subsection (b) of section 19.

(f) The Commission shall remove from the restricted data category such information concerning the programs of other nations relating to the development and use of rockets, missiles, satellites, and spaceships as the Commission and the Director of Central Intelligence jointly determine to be necessary to carry out the provisions of section 102 (d) of the National Security Act of 1947 (50 U. S. C. 403 (d)) and can be adequately safeguarded as defense information.

ACCESS TO RESTRICTED DATA

SEC. 18. The Commission may authorize any of its employees, or employees of any contractor or prospective contractor of the Commission, to permit any employee of an agency of the Department of Defense or of its contractors, or any member of the Armed Forces, to have access to restricted data required in the performance of his duties and so certified by the head of the appropriate agency of the Department of Defense, or his designee, if—

(1) the head of the appropriate agency of the Department of Defense, or his designee, has determined in accordance with the established personnel

security procedures and standards of such agency, that permitting the member or employee to have access to such restricted data will not endanger the common defense and security; and

(2) the Secretary of Defense finds that the established personnel and other security procedures and standards of such agency are adequate and in reasonable conformity to the standards established by the Commission under subsection (f) of section 20.

COMMUNICATION OF RESTRICTED DATA

SEC. 19. (a) The President may authorize the Commission to cooperate with another nation and to communicate to that nation restricted data on—

(1) rockets, missiles, satellites, and spaceships;

(2) health and safety;

(3) industrial and other applications of rockets, missiles, satellites, and spaceships for peaceful purposes; and

(4) research and development relating to the foregoing.

No such cooperation shall involve the communication of restricted data relating to the design or fabrication of rockets, missiles, satellites, or spaceships, developed solely for military application. Such cooperation shall be undertaken pursuant to an agreement for cooperation entered into in accordance with section 16, or shall be undertaken pursuant to an agreement existing on the effective date of this Act.

(b) The President may authorize the Department of Defense, with the assistance of the Commission, to cooperate with another nation or with a regional defense organization to which the United States is a party, and to communicate to that nation or organization such restricted data as is necessary to—

(1) the development of defense plans;

(2) the training of personnel in the employment of and defense against rockets, missiles, satellites, and spaceships; and

(3) the evaluation of the capabilities of potential enemies in the employment of rockets, missiles, satellites, and spaceships for military purposes;

while such other nation or organization is participating with the United States pursuant to an international arrangement by substantial and material contributions to the mutual defense and security. No such cooperation shall involve communication of restricted data relating to the design or fabrication of rockets, missiles, satellites, and spaceships, developed solely for military application, except with regard to external characteristics (including size, weight, and shape, yields and effects, and systems employed in the delivery or use thereof), but not including any data in these categories unless in the joint judgment of the Commission and the Department of Defense the communication of such data will not endanger the common defense and security. Such cooperation shall be undertaken pursuant to an agreement for cooperation entered into in accordance with section 16.

RESTRICTIONS

SEC. 20. (a) No arrangement shall be made under section 14 unless the person with whom such arrangement is made agrees in writing not to permit any individual to have access to restricted data until the United States Civil Service Commission shall have made an investigation and report to the Commission on the character, associations, and loyalty of such individual, and the Commission shall have determined that permitting such person to have access to restricted data will not endanger the common defense and security.

(b) Except as authorized by the Commission or the General Manager, upon a determination by the Commission or the General Manager that such action is clearly consistent with the national interest, no individual shall be employed by the Commission, nor shall the Commission permit any individual to have access to restricted data, until the United State Civil Service Commission shall have made an investigation and report to the Commission on the character, associations, and loyalty of such individual, and the Commission shall have determined that permitting such person to have access to restricted data will not endanger the common defense and security.

(c) In the event an investigation made pursuant to subsection (a) and (b) of this section develops any data reflecting that the individual who is the subject of the investigation is of questionable loyalty, the United States Civil Service Commission shall refer the matter to the Federal Bureau of Investigation for

the conduct of a full field investigation, the results of which shall be furnished to the United States Civil Service Commission for its information and appropriate action.

(d) If the President deems it to be in the national interest, he may from time to time cause investigations of any group or class referred to in subsections (a) and (b) of this section to be made by the Federal Bureau of Investigation instead of the United States Civil Service Commission.

(e) Notwithstanding the provisions of subsections (a) and (b) of this section, a majority of the members of the Commission shall certify those specific positions which are of a high degree of importance or sensitivity and upon such certification the investigation and reports required by such subsections (a) and (b) shall be made by the Federal Bureau of Investigation instead of by the United States Civil Service Commission.

(f) The Commission shall establish standards and specifications in writing as to the scope and extent of investigations to be made by the United States Civil Service Commission pursuant to subsections (a) and (b) of this section. Such standards and specifications shall be based on the location and class or kind of work to be done; and shall, among other considerations, take into account the degree of importance to the common defense and security of the restricted data to which access will be permitted.

GENERAL PROVISIONS RELATING TO CONTROL OF INFORMATION

SEC. 21. (a) Sections 17 to 20, inclusive, shall not exclude the applicable provisions of any other law, except that no Government agency shall take any action under such other laws inconsistent with the provisions of such subsections.

(b) The Commission shall have no power to control or restrict the dissemination of information other than as granted by this or any other law.

GENERAL AUTHORITY

SEC. 22. In the performance of its functions under this Act the Commission is authorized to—

(1) make such studies and investigations, obtain such information, and hold such meetings or hearings as the Commission may deem necessary or proper to assist it in exercising any authority provided in this Act, or in the administration or enforcement of this Act, or any regulations issued under this Act;

(2) administer oaths and affirmations, and by subpena to require any person to appear and testify, or to appear and produce documents, or both, at any designated place, and no person shall be excused from attending and testifying or from producing documents before the Commission, or in obedience to the subpena of the Commission, or in any case or proceeding instituted by the Commission, on the ground that the testimony or evidence, documentary or otherwise required of him, may tend to incriminate him or subject him to a penalty or forfeiture; but no individual shall be prosecuted or subjected to any penalty or forfeiture for or on account of any transaction, matter, or thing concerning which he is compelled, after having claimed his privilege against self-incrimination, to testify or produce evidence, documentary or otherwise, except that such individual so testifying shall not be exempt from prosecution and punishment for perjury committed in so testifying;

(3) appoint and fix the compensation of such officers and employees as may be necessary to carry out the functions of the Commission, and such officers and employees shall be appointed in accordance with the civil-service laws and their compensation fixed in accordance with the Classification Act of 1949, as amended, except that, to the extent the Commission deems such action necessary to the discharge of its responsibilities, personnel may be employed and their compensation fixed without regard to such laws, but no officer or employee (except such officers and employees whose compensation is fixed by law, and scientific and technical personnel) whose position would be subject to the Classification Act of 1949, as amended, if such Act were applicable to such position, shall be paid a salary at a rate in excess of the rate payable under such Act for positions of equivalent difficulty or responsibility;

(4) make adequate provision for administrative review of any determination to dismiss any employee;

(5) utilize or employ the services of personnel of any Government agency or any State or local government agency, with the consent of the agency concerned, or voluntary or uncompensated personnel, to perform such functions on behalf of the Commission as it may deem advisable;

(6) prescribe such regulations as it may deem necessary to protect restricted data received by any person in connection with any activity authorized by this Act;

(7) assign scientific, technical, professional, and administrative employees for instruction, education, or training by public or private agencies, institutions of learning, laboratories, or industrial or commercial organizations and to pay the whole or any part of the salaries of such employees, costs of their transportation and per diem in lieu of subsistence in accordance with applicable laws and regulations, and training charges incident to their assignments (including tuition and other related fees), and appropriations or other funds available to the Commission for salaries or expenses shall be available for the purposes of this paragraph, but (A) not more than one per centum of the eligible employees shall be so assigned during any fiscal year, and (B) any such assignment shall be approved in advance by the Commission or shall be in accordance with a training program previously approved by the Commission; and

(8) issue, rescind, and amend such regulations as may be necessary to carry out the purposes of this Act.

85TH CONGRESS

2D SESSION

H. R. 9966

IN THE HOUSE OF REPRESENTATIVES

JANUARY 14, 1958

Mr. COAD introduced the following bill; which was referred to the Committee on Armed Services

A BILL

To establish a National Commission on Astronautics for the purpose of promoting research, development, and operations in the field of astronautics, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the Astronautics Act of 1958."

DECLARATION OF POLICY

SEC. 2. It is hereby declared to be the policy of the people of the United States to conduct a vigorous, unified national program in astronautical research and development and in the application of the results of this work to the common defense and security, to the general welfare and to the interest of international peace.

FINDINGS

SEC 3. The Congress hereby makes the following findings concerning the field of astronautics.

(1) The development of high performance rockets has reached such a state of advancement that it is possible to establish a vigorous, unified program in the scientific exploration and eventual habitation of outer space.

(2) It is imperative that the United States establish and maintain scientific and technological leadership in outer space research in the interest of human progress and common defense.

(3) The development of a unified national program will promote the educational, cultural, and intellectual character of the people of the United States, and will provide the foundations for many important civil and military applications.

PURPOSE

SEC. 4. It is the purpose of this Act to carry out the policy set forth in section 2 of this Act by providing for—

(1) a program of conducting, assisting, and fostering research and development in order to encourage maximum scientific, educational, and industrial progress;

(2) a program of laboratory and field facilities and of flight operations;

(3) a program for the dissemination of scientific and technical information subject to appropriate security safeguards, so as to encourage scientific, educational, and industrial progress;

(4) a program to encourage widespread participation in the field of astronautics for peaceful purposes to the maximum extent consistent with the common defense and security and with the health and safety of the public;

(5) a program of international cooperation to promote the common defense and security and to make available to cooperating nations the benefits of peaceful application of astronautics;

(6) a program of administration which will be consistent with the foregoing policies and programs, with international arrangements, and with agreements for cooperation, and which will enable the Congress to be currently informed with respect to the administration of this Act so as to take such further legislative action as may be appropriate.

DEFINITIONS

SEC. 5. As used in this Act—

(1) the term "Commission" means the National Commission on Astronautics;

(2) the term "astronautics" means all phases of rocket, missile, satellite, and spaceship design, engineering, and flight, and all other fields of knowledge, investigation, and operation as are related thereto;

(3) the term "agreement for cooperation" means any agreement with another nation or regional defense organization;

(4) the term "Government agency" means any executive department, commission, independent establishment, corporation (wholly or partly owned by the United States), or any board, bureau, division, service, office, officer, authority, administration, or other establishment in the executive branch of the Government;

(5) the term "international arrangement" means any international agreement approved by the Congress after the date of enactment of this Act, or any treaty, during the time such agreement or treaty is in full force and effect, but does not include any agreement for cooperation;

(6) the term "research and development" means (A) theoretical analysis, exploration, or experimentation; and (B) the extension of investigative findings and theories of a scientific or technical nature into practical application for experimental and demonstrational purposes, including the experimental production and testing of models, devices, equipment, materials, and processes;

(7) the term "United States", when used in a geographical sense, includes the several States, Territories, and possessions of the United States, the Commonwealth of Puerto Rico, and the District of Columbia.

ESTABLISHMENT OF COMMISSION

SEC. 6. There is hereby established a National Commission on Astronautics to be composed of five members, each of whom shall be a citizen of the United States. The President shall designate one member of the Commission as Chairman thereof to serve as such during the pleasure of the President. The Chairman may from time to time designate any other member of the Commission as Acting Chairman to act in the place and stead of the Chairman during his absence. The Chairman (or Acting Chairman in the absence of the Chairman) shall preside at all meetings of the Commission and a quorum for the transaction of business shall consist of at least three members present. Each member of the Commission, including the Chairman, shall have equal responsibilities and authority

in all decisions and actions of the Commission and shall have one vote. Action of the Commission shall be determined by a majority vote of the members present. The Chairman (or the Acting Chairman in the absence of the Chairman) shall be the official spokesman of the Commission in its relations with the Congress, Government agencies, persons, or the public, and, on behalf of the Commission, shall see to the faithful execution of the policies and decisions of the Commission, and shall report thereon to the Commission from time to time or as the Commission may direct. The Commission shall have an official seal which shall be judicially noticed.

MEMBERSHIP OF COMMISSION; TERM OF OFFICE; COMPENSATION

SEC. 7. (a) Members of the Commission shall be appointed by the President, by and with the advice and consent of the Senate. In submitting any nomination to the Senate, the President shall set forth the experience and qualifications of the nominee. The term of office of each member of the Commission shall be five years, except that of the members first appointed, one shall be appointed for a term of one year, one for a term of two years, one for a term of three years, one for a term of four years, and one for a term of five years. Any member appointed to fill a vacancy occurring before the expiration of the term for which his predecessor was appointed shall be appointed for the remainder of such term. Any member of the Commission may be removed by the President for inefficiency, neglect of duty, or malfeasance in office. Each member, except the Chairman, shall receive compensation at the rate of $18,000 per annum; and the member designated as Chairman shall receive compensation at the rate of $20,000 per annum.

(b) No member of the Commission shall engage in any business, vocation, or employment, other than that of serving as a member of the Commission. No person is eligible to serve as a Commissioner while receiving retirement benefits from the United States Government.

PRINCIPAL OFFICE OF THE COMMISSION

SEC. 8. The principal office of the Commission shall be in or near the District of Columbia, but the Commission or any duly authorized representative may exercise any or all of its powers in any place; however, the Commission shall maintain an office for the service of process and papers within the District of Columbia.

GENERAL MANAGER

SEC. 9. There is hereby established within the Commission a General Manager, who shall discharge such administrative and executive functions of the Commission as the Commission may direct. The General Manager shall be appointed by the Commission, shall serve at the pleasure of the Commission, shall be removable by the Commission, and shall receive compensation at a rate determined by the Commission, but not in excess of $20,000 per annum.

DIVISIONS WITHIN COMMISSION; DIRECTORS

SEC. 10. There is hereby established within the Commission—

(1) a Division of Research, a Division of Engineering, a Division of Operations, and such other program divisions as the Commission may determine to be necessary to the discharge of its responsibilities. The Divisions of Engineering and Operations shall have the responsibility to include development and application for civilian uses. Each such division shall be under the direction of a Director who shall be appointed by the Commission and shall receive compensation at a rate determined by the Commission, but not in excess of $16,000 per annum. The Commission shall require each such division to exercise such of its administrative and executive powers as the Commission may determine;

(2) an Office of the General Counsel under the direction of the General Counsel who shall be appointed by the Commission and shall receive compensation at a rate determined by the Commission, but not in excess of $16,000 per annum; and

(3) an Inspection Division under the direction of a Director who shall be appointed by the Commission and shall receive compensation at a rate determined by the Commission, but not in excess of $16,000 per annum. The Inspection Division shall be responsible for gathering information to

show whether or not the contractors and officers and employees of the Commission are complying with the provisions of this Act and the appropriate rules and regulations of the Commission.

GENERAL ADVISORY BOARD

SEC. 11. There shall be a General Advisory Board to advise the Commission on relevant scientific and technical matters to be composed of nine members, appointed from private life by the President. The term of office of each member shall be six years, except that of the members first appointed three shall be appointed for a term of two years, three for a term of four years, and three for a term of six years. Any member appointed to fill a vacancy occurring before the expiration of the term for which his predecessor was appointed shall be appointed for the remainder of such term. The Board shall designate one of its own members as Chairman. The Board shall meet at least four times in every calendar year. The members of the Board shall receive compensation at the rate of $50 per diem for each day spent in meetings or conferences, and shall receive necessary traveling or other expenses incurred by them while engaged in the work of the Board.

RELATIONSHIP TO OTHER GOVERNMENT AGENCIES

SEC. 12. (a) The interests of the Commission shall be paramount in the field of astronautics among all Government agencies, except for such aspects of the field as are determined by the President to be of clear and immediate military importance.

(b) The Commission shall cooperate with and assist other Government agencies to the fullest extent in serving related interests of such agencies.

(c) All other agencies of the Government are authorized and directed to provide cooperation and assistance to the Commission in the execution of the provisions of this Act.

DEPARTMENT OF DEFENSE LIAISON OFFICE

SEC. 13. There is hereby established a Department of Defense Liaison Office consisting of six representatives assigned by the Secretary of Defense and who shall serve without additional compensation. The Commission shall advise and consult with the Department of Defense, through the Liaison Office, on all scientific and technological matters coming under the authority of the Commission which the Department of Defense deems related to military applications. The Liaison Office shall keep the Department of Defense fully and currrently informed on all such matters before the Commission. The Department of Defense shall, through the Liaison Office, keep the Commission fully and currently informed on all matters within the Department of Defense which the Commission deems related to the field of astronautics.

INTERNATIONAL ACTIVITIES

SEC. 14. (a) The Commission is authorized to cooperate in any international scientific research activities consistent with the purposes of this Act and to expend for such international scientific activities, such sums within the limit of appropriated funds as the Commission may deem desirable. The General Manager with the approval of the Commission, may defray the expenses of representatives of Government agencies and other organizations and individual scientists to accredited international scientific congresses and meetings whenever he deems it necessary in the promotion of the objectives of this Act.

(b) (1) The authority to enter into contracts or other arrangements with organizations or individuals in foreign countries and with agencies of foreign countries and the authority to cooperate in international scientific research activities as provided in subsection (a) of this section shall be exercised only with the approval of the Secretary of State to the end that such authority shall be exercised in such manner as is consistent with the foreign policy objectives of the United States.

(2) If in the exercise of the authority referred to in paragraph 1 of this subsection, negotiation with foreign countries or agencies thereof becomes necessary, such negotiation with foreign countries shall be carried on by the Secretary of State in consultation with the Commission.

(c) Any provisions of this Act or any action of the Commission to the extent and during the time that it conflicts with the provisions of any international arrangement made after the date of enactment of this Act shall be deemed to be of no force or effect.

(d) In the performance of its functions under this Act the Commission shall give maximum effect to the policy contained in any international arrangement made after the date of enactment of this Act.

INFORMATION

SEC. 15. (a) It shall be the policy of the Commission to—

(1) maintain a complete collection of information resulting from activities of the Commission;

(2) collect from all available sources information relating to the field of astronautics; and

(3) to disseminate such information by publication and distribution of reports, conferences, and by any other means.

(b) The collection and dissemination of information under this section shall be in such a manner as to safeguard the common defense and security in accordance with the National Security Act of 1947, as amended.

PATENTS

SEC. 16. (a) Each contract or other arrangement executed pursuant to this Act which relates to scientific research shall contain provisions governing the disposition of inventions produced thereunder in a manner calculated to protect the public interest and the equities of the individual or organization with which the contract or other arrangement is executed: *Provided, however,* That nothing in this Act shall be construed to authorize the Commission to enter into any contractual or other arrangement inconsistent with any provision of law effecting the issuance or use of patents.

(b) No officer or employee of the Commission shall acquire, retain, or transfer any rights, under the patent laws of the United States or otherwise, in any invention which he may make or produce in connection with performing his assigned activities and which is directly related to the subject matter thereof: *Provided, however,* That this subsection shall not be construed to prevent any officer or employee of the Commission from executing any application for patent on any such invention for the purpose of assigning the same to the Government or its nominee in accordance with such rules and regulations as the Commission may establish.

COMPENSATION FOR INDIVIDUALS

SEC. 17. (a) JUST COMPENSATION.—The United States shall make just compensation for any property or interests therein taken or requisitioned pursuant to the provisions of this Act. Except in case of real property or any interest therein, the Commission shall determine and pay such just compensation. If the compensation so determined is unsatisfactory to the person entitled thereto, such person shall be paid 75 per centum of the amount so determined, and shall be entitled to sue the United States in the Court of Claims or in any district court of the United States for the district in which such claimant is a resident in the manner provided by section 1346 of title 28 of the United States Code to recover such further sum as added to said 75 per centum will constitute just compensation.

(b) CONDEMNATION OF REAL PROPERTY.—Proceedings for condemnation shall be instituted pursuant to the provisions of the Act approved August 1, 1888, as amended, and section 1403 of title 28 of the United States Code. The Act approved February 26, 1931, as amended, shall be applicable to any such proceedings.

(c) PATENT APPLICATION DISCLOSURES.—In the event that the Commission communicates to any nation any data based on any patent application not belonging to the United States, just compensation shall be paid by the United States to the owner of the patent application. The Commission shall determine such compensation. If the compensation so determined is unsatisfactory to the person entitled thereto, such person shall be paid 75 per centum of the amount so determined, and shall be entitled to sue the United States in the Court of Claims or in any district court of the United States for the district in which such claimant is a resident in a manner provided by section 1346 of title 28 of the United States Code to recover such further sum as added to such 75 per centum will constitute just compensation.

(d) ATTORNEY GENERAL APPROVAL OF TITLE.—All real property acquired under this Act shall be subject to the provisions of section 355 of the Revised Statutes, as amended: *Provided, however,* That real property acquired by purchase or donations, or other means of transfer, may also be occupied, used, and improved for the purposes of this Act prior to approval of title by the Attorney General in those cases where the President determines that such action is required in the interest of the common defense and security.

SECURITY PROVISIONS

SEC. 18. (a) NUCLEAR ENERGY RESEARCH AND DEVELOPMENT.—The Commission shall not support any research or development activity in the field of nuclear energy, nor shall it exercise any authority in respect to that field, without first having obtained the concurrence of the Atomic Energy Commission that such activity will not adversely affect the common defense and security. To the extent that such activity involves restricted data as defined in the Atomic Energy Act of 1946, as amended, the provisions of that Act regarding the control of the dissemination of restricted data and the security clearance of those individuals to be given access to restricted data shall be applicable. Nothing in this section shall supersede or modify any provision of the Atomic Energy Act of 1946, as amended.

(b) RESEARCH RELATING TO NATIONAL DEFENSE.—

(1) In the case of scientific or technical research activities under this Act, the Commission, in consultation with other appropriate governmental agencies, shall establish such security requirements and safeguards as it may deem necessary.

(2) Any agency of the Government exercising investigatory functions is authorized to make such investigations and reports as may be requested by the Commission in connection with the enforcement of security requirements and safeguards, including restrictions with respect to access to information and property, established under paragraph (1) of this subsection.

(c) CLEARANCE OF PERSONNEL.—No employee of the Commission shall be permitted to have access to information or property with respect to which access restrictions have been established under subsection (b) (1) of this section until the Civil Service Commission shall have made an investigation into the character, associations, and loyalty of such individual and shall have reported the findings of said investigation to the Commission, and the Commission shall have determined that permitting such individual to have access to such information or property will not endanger the common defense and security.

GENERAL AUTHORITY

SEC. 19. (a) REPORT TO CONGRESS.—The Commission shall submit to the Congress, in January and July of each year, a report concerning the activities of the Commission. The Commission shall include in such report, and shall at such other times as it deems desirable submit to the Congress, such recommendations for additional legislation as the Commission deems necessary or desirable.

(b) SEPARABILITY.—If any provision of this Act or the application of such provision to any persons or circumstances, is held invalid, the remainder of this Act or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.

(c) APPROPRIATIONS.—There are hereby authorized to be appropriated such sums as may be necessary and appropriate to carry out the provisions and purposes of this Act to include funds for acquisition or condemnation of any real property or any facility for plant or facility acquisition, construction, or expansion. The Acts appropriating such sums may appropriate specified portions thereof to be accounted for upon the certification of the Commission only. Funds appropriated to the Commission shall, if obligated by contract during the fiscal year for which appropriated, remain available for expenditure for four years following the expiration of the fiscal year for which appropriated.

(d) INVESTIGATION.—In the performance of its functions under this Act the Commission is authorized to make such studies and investigations, obtain such information, and hold such meetings or hearings as the Commission may deem necessary or proper to assist it in exercising any authority provided in this Act, or in the administration or enforcement of this Act, or any regulations issued under this Act.

(e) COMPENSATION.—Under this Act the Commission is authorized to appoint and fix the compensation of such officers and employees as may be necessary to carry out the functions of the Commission, and such officers and employees shall be appointed in accordance with the civil service laws and their compensation fixed in accordance with the Classification Act of 1949, as amended, except that, to the extent the Commission deems such action necessary to the discharge of its responsibilities, personnel may be employed and their compensation fixed without regard to such laws, but no officer or employee (except such officers and employees whose compensation is fixed by law, and scientific and technical personnel) whose position would be subject to the Classification Act of 1949, as amended, if such Act were applicable to such position, shall be paid a salary at a rate in excess of the rate payable under such Act for positions of equivalent difficulty or responsibility.

(f) REVIEW.—Under this Act the Commission is authorized to make adequate provision for administrative review of any determination to dismiss any employee.

(g) RESCIND.—Under this Act the Commission is authorized to issue, rescind, and amend such regulations as may be necessary to carry out the purpose of this Act.

85TH CONGRESS

2D SESSION

S. 3117

IN THE SENATE OF THE UNITED STATES

JANUARY 23, 1958

Mr. ANDERSON introduced the following bill; which was read twice and referred to the Joint Committee on Atomic Energy

(also, H. R. 10271, Mr. Durham; and H. R. 10352, Mr. Holifield)

A BILL

To amend the Atomic Energy Act of 1954, as amended, to provide for outer space development through the peaceful application of atomic energy, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as "The Outer Space Development Amendment of 1958".

SEC. 2. The Atomic Energy Act of 1954, as amended, is amended by redesignating chapter 19 as chapter 20, and inserting a new chapter 19, reading as follows:

"CHAPTER 19. OUTER SPACE DEVELOPMENT

SEC. 241. PURPOSE AND POLICY.—It is declared to be the purpose and policy of the United States—

"a. to achieve the development and control of outer space for peaceful purposes by the United States and all friendly nations working cooperatively to promote scientific progress and the security and welfare of all nations and peoples of the earth.

"b. to accelerate the civilian development of outer space propulsion, including appropriate energy-producing reactors and engines, vehicles and platforms, and all other related components and activities.

"SEC. 242. PROGRAM.—

"a. The Atomic Energy Commission is authorized and directed to exercise its powers in such a manner as to accelerate research and development on outer space propulsion, including appropriate energy-producing reactors and engines, space vehicles and platforms, and all other related components and activities.

"b. There is hereby established within the Commission a Division of Outer Space Development which shall administer the Commission's activities under this Act. The Division shall be under the direction of an Assistant General Manager who shall be appointed by the Commission upon the recommendation of the General Manager.

"c. The Commission, to the fullest extent practicable, shall utilize existing atomic energy laboratory installations, and other Government installations, personnel, and services, provided that the Commission shall retain full authority for the planning, direction, and overall budget control for such programs and projects.

"SEC. 243. OUTER SPACE ADVISORY COMMITTEE.—There is hereby established an Outer Space Advisory Committee (hereafter referred to as the "Committee") which shall be composed of seven members appointed from civilian life by the President with the advice and consent of the Senate. The Committee shall be responsible for reviewing and advising the Commission, the President and other Government agencies, the Congress, and the public as to the adequacy of proposed programs and the status and results of projects undertaken to carry out the purposes of this Act.

"SEC. 244. INTERNATIONAL LABORATORY FOR OUTER SPACE PROPULSION.—The Commission, with the general policy guidance of the State Department, is authorized and directed to undertake to negotiate and execute an agreement with cooperating nations for the establishment of and participation in an international laboratory for outer space propulsion.

"SEC. 245. NATIONAL LABORATORY FOR OUTER SPACE PROPULSION.—In order to carry out the purposes and policy of this Act, and consistent with the provisions of section 242 (c) and 244, the Commission is authorized to establish a national laboratory to serve as a domestic center for research and development on outer space propulsion and related activities."

SEC. 3. Section 202 of the Atomic Energy Act of 1954, as amended, is amended in the following particulars, as follows:

a. At the end of the first, fourth, and fifth sentences add the following: "and outer space propulsion."

b. In the sixth sentence, following the words "atomic energy", add the following: "or outer space propulsion."

SEC. 4. The sum of $50,000,000 is authorized to be appropriated or otherwise made available to finance initial operations and construction to carry out the provisions of this amendment.

85TH CONGRESS

2D SESSION

S. 3000

IN THE SENATE OF THE UNITED STATES

JANUARY 16, 1958

Mr. GORE (for himself and Mr. MONRONEY) introduced the following bill; which was read twice and referred to the Joint Committee on Atomic Energy

A BILL

To amend the Atomic Energy Act of 1954, as amended, to provide for an accelerated atomic power program, to accelerate the development of controlled thermonuclear processes, to accelerate the development of nuclear propulsion for rockets, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Atomic Energy Amendment of 1958."

SEC. 2. The Atomic Energy Act of 1954, as amended, is amended by redesignating chapter 19 as chapter 22, and inserting new chapters 19, 20, and 21, reading as follows:

"CHAPTER 19. ACCELERATED ATOMIC POWER PROGRAM

"SEC. 241. PURPOSE AND POLICY.—

"a. It is the purpose of the United States and of this chapter:

"(1) To encourage the continued development of atomic power technology and the advancement of the art through practical experience in the development and operation of prototype atomic powerplants;

"(2) To achieve economic atomic power as rapidly as practicable;

"(3) To advance the spirit of the International Atomic Energy Agency, and the Atoms-for-Peace plan.

"b. (1) In order to carry out the purposes of this chapter, it is hereby declared to be the policy of the United States to accelerate the civilian atomic power program and maintain leadership in atomic power technology by the construction of additional demonstration prototype reactors for domestic use and foreign applications at the maximum possible rate consistent with the status of the development of the art.

"(2) The accelerated program authorized by this chapter shall be carried out under the provisions of section 31, and shall be supplementary to other reactor development programs and projects authorized under this Act, including sections 31 and 104.

"SEC. 242. In order to implement the policy established in section 241, the Commission is authorized and directed as follows:

"a. ACCELERATED POWER REACTOR PROGRAM.—

"(1) The Commission is hereby authorized and directed to proceed with the construction under contract, as soon as practicable, of large-scale prototype power reactor demonstration facilities designed to demonstrate the practical value of utilization facilities for the generation of electric energy in industrial or commercial quantities.

"(2) The selection of design for such reactor facilities shall be made on the basis of a determination that development, construction, and operation of a facility so designed offers promise of making a contribution to the advance of the art and technology of the large-scale production of atomic power in the form of electricity in commercial or industrial quantities.

"(3) The power reactor demonstration facilities authorized by this subsection shall be constructed at sites of major production facilities operated by or on behalf of the Commission, and the electric energy generated shall be used by the Commission in connection with the operation of such production facility.

"b. ADVANCED DESIGN AND DEVELOPMENT PROGRAM.—

"(1) The Commission shall proceed with the development of reactor designs which involve, in concept and approach, significant and promising advances in reactor technology.

"(2) As soon as practicable, consistent with the development of appropriate designs, the Commission is authorized and directed to proceed with the construction under contract of prototype power reactors utilizing such advanced concepts, such reactors to be capable of producing not to exceed fifty thousand kilowatts of electricity.

"c. FOREIGN ATOMIC POWER ASSISTANCE.—

"In order effectively to carry out the Atoms for Peace Plan of the United States, the Commission shall have responsibility for the conduct of a vigorous program of international cooperation and assistance in the design, construction, and operation of power reactors and related matters. The planning and execution of such a program shall be undertaken as rapidly as practicable.

"d. SUPPORTING FACILITIES.—

"The Commission is authorized to construct, own, and operate supporting facilities necessary in connection with projects initiated under subsections a, b, and c of this section.

"e. QUARTERLY REPORT.—

"The Commission shall report to the Joint Committee on Atomic Energy quarterly beginning July 1, 1958, on the progress under the acceleration program."

"CHAPTER 20. NUCLEAR PROPULSION

"SEC. 245. In order to promote the development of processes and techniques for travel beyond the atmosphere of the earth, the Atomic Energy Commission is authorized and directed to accelerate existing programs for the development of nuclear rocket propulsion. The Atomic Energy Commission is further authorized and directed to proceed with the development of a manned vehicle powered by nuclear propulsion and capable of sustained travel outside the earth's atmosphere.

"CHAPTER 21. THERMONUCLEAR REACTION

"SEC. 246. It is hereby declared to be in the national interest that the United States attain and maintain a position of leadership in the field of controlled thermonuclear reaction.

"SEC. 247. In order to implement the policy set forth in section 246, the Atomic Energy Commission is hereby authorized and directed:

"a. To pursue with all practicable speed the perfecting of laboratory processes for the production of usable energy from controlled thermonuclear reaction.

"b. To construct as soon as practicable either directly, or under contract, or otherwise, experimental reactors for the production of usable energy in the form of electricity or otherwise, by means of thermonuclear processes."

SEC. 3. Chapter 19 of the Atomic Energy Act of 1954, as amended, is redesignated as chapter 22 and sections 241 and 251 of this Act are redesignated respectively as sections 259 and 260, making appropriate amendment to the table of contents.

SEC. 4. There is hereby authorized to be appropriated the sum of $1,000,000,000 to carry out the purposes of this Act.

85TH CONGRESS

2D SESSION

H. R. 11188

IN THE HOUSE OF REPRESENTATIVES

MARCH 5, 1958

Mr. FRELINGHUYSEN introduced the following bill; which was referred to the Committee on Armed Services

(also, H. R. 11860, Mr. Fulton, of Pennsylvania)

A BILL

To amend the Act of March 3, 1915, as amended, to increase the scope of the activities of the National Advisory Committee for Aeronautics (renamed in this Act the National Advisory Committee for Aeronautics and Astronautics), to establish in the Congress a Joint Committee on Astronautics, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

TITLE I—NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS AND ASTRONAUTICS

SECTION 101. (a) The section (consisting of subsections (a), (b), and (c)) beginning with the center heading "National Advisory Committee for Aeronautics" in the Act entitled "An Act making appropriations for the naval service for the fiscal year ending June thirtieth, nineteen hundred and sixteen, and for other purposes," approved March 3, 1915, as amended (50 U. S. C. 151), is amended—

(1) by striking out such center heading and inserting in lieu thereof the following: "National Advisory Committee for Aeronautics and Astronautics";

(2) by inserting immediately after "National Advisory Committee for Aeronautics" in subsection (a) the following: "and Astronautics"; and

(3) by (A) striking out "and" immediately before "(3) to direct" in subsection (b), (B) by inserting "and astronautics" immediately after "aeronautics" in clause (3) of such subsection, and (C) by striking out the period at the end of such subsection and inserting in lieu thereof a comma and the following: "(4) to direct and conduct scientific observations, experiments, and explorations on the problems of flight of aircraft, missiles, and space craft within and outside of the earth's atmosphere, including the procurement and operation of manned and unmanned vehicles for such purpose,

and (5) to coordinate the military and civilian programs of the Federal Government for the scientific investigation of space technology."

(b) Any law, regulation, document, or record of the United States in which the agency, redesignated the "National Advisory Committee for Aeronautics and Astronautics" by subsection (a) of this section, is designated or referred to as the "National Advisory Committee for Aeronautics" or the "NACA" shall be held and considered to refer to such agency as the "National Advisory Committee for Aeronautics and Astronautics".

TITLE II—ESTABLISHMENT OF THE JOINT COMMITTEE ON ASTRONAUTICS

SEC. 201. There is hereby established a joint committee to be known as the Joint Committee on Astronautics (referred to in this title as the "Joint Committee").

SEC. 202. The Joint Committee shall be composed of nine Members of the Senate to be appointed by the President of the Senate, and nine Members of the House of Representatives to be appointed by the Speaker of the House of Representatives. In each instance not more than five Members shall be members of the same political party.

SEC. 203. The Joint Committee shall make continuing studies of the activities of the various departments and agencies of the Federal Government and the activities of private agencies, relating to the development, use, and control of earth satellites and manned and unmanned outer-space vehicles and other mechanisms designed for travel in outer space, and shall make continuing studies of all problems relating to the navigation, use, or control of outer space. The National Advisory Committee for Aeronautics and Astronautics and other departments and agencies of the Federal Government concerned with earth satellites, manned or unmanned outer-space vehicles or other mechanisms designed for the navigation of outer space, or problems relating to the navigation, use, or control of outer space shall keep the Joint Committee fully and currently informed with respect to all such matters within their jurisdiction. Any department or agency of the Federal Government shall furnish any information requested by the Joint Committee with respect to the activities or responsibilities of that department or agency in such fields. All bills, resolutions, or other matters in the Senate or the House of Representatives, relating primarily to the development, use, or control of earth satellites, manned or unmanned outer-space vehicles or other mechanisms designed for travel in outer space, or problems relating to the navigation, use, or control of outer space shall be referred to the Joint Committee. The members of the Joint Committee who are Members of the Senate shall from time to time report to the Senate, and the members of the Joint Committee who are Members of the House of Representatives shall from time to time report to the House, by bill or otherwise, their recommendations with respect to matters within the jurisdiction of their respective Houses which are referred to the Joint Committee or are otherwise within the jurisdiction of the Joint Committee.

SEC. 204. Vacancies in the membership of the Joint Committee shall not affect the power of the remaining members to execute the functions of the Joint Committee, and shall be filled in the same manner as in the case of the original selection. The Joint Committee shall select a chairman and a vice chairman among its members at the beginning of each Congress. The vice chairman shall act in the place and stead of the chairman in the absence of the chairman. The chairmanship shall alternate between the Senate and the House of Representatives with each Congress, and the chairman shall be selected by the members from that House entitled to the chairmanship. The vice chairman shall be chosen from the House other than that of the chairman by the members from that House.

SEC. 205. In carrying out its duties under this title, the Joint Committee, or any duly authorized subcommittee thereof, is authorized to hold such hearings or investigations, to sit and act at such places and times, to require, by subpena or otherwise, the attendance of such witnesses and the production of such books,

papers, and documents, to administer such oaths, to take such testimony, to procure such printing and binding, and to make such expenditures as it deems advisable. The Joint Committee may make such rules respecting its organization and procedures as it deems necessary, but no measure or recommendation shall be reported from the Joint Committee unless a majority of the Joint Committee assent. Subpenas may be issued over the signature of the chairman of the Joint Committee or by any member designated by him or by the Joint Committee, and may be served by such person as may be designated by such chairman or member. The chairman of the Joint Committee or any member thereof may administer oaths to witnesses. The provisions of sections 102 to 104, inclusive, of the Revised Statutes of the United States (2 U. S. C. 192-194), shall apply in case of the failure of any witness to comply with a subpena or to testify when summoned under authority of this section. The expenses of the Joint Committee shall be paid from the contingent fund of the House upon vouchers approved by the chairman. Members of the Joint Committee, and its employees and consultants, while traveling on official business for the committee, may receive either the per diem allowance authorized to be paid to Members of Congress or its employees, or their actual and necessary expenses if an itemized statement of such expenses is attached to the voucher.

SEC. 206. The Joint Committee may appoint and fix the compensation of such experts, consultants, technicians, and staff employees as it deems necessary and advisable. The Joint Committee is authorized to utilize the services, information, facilities, and personnel of the departments and establishments of the Government.

SEC. 207. The Joint Committee may classify information originating within the Joint Committee in accordance with standards used generally by the executive branch of the Government for classifying restricted data or defense information.

SEC. 208. The Joint Committee shall keep a complete record of all committee actions, including a record of the votes on any question on which a record vote is demanded. All Joint Committee records, data, charts, and files shall be the property of the Joint Committee and shall be kept in the offices of the Joint Committee, or such other places as the Joint Committee may direct, under such security safeguards as the Joint Committee shall determine to be in the interest of the common defense and security.

TITLE III--MISCELLANEOUS AMENDMENTS

SEC. 301. (a) (1) The first section of the Act of August 1, 1947, as amended (50 U. S. C. 153), is amended to read as follows:

"That the Chairman of the National Advisory Committee for Aeronautics and Astronautics is authorized to appoint, and fix the compensation of, such personnel as he determines are necessary to carry out the functions of the National Advisory Committee for Aeronautics and Astronautics, without regard to the Classification Act of 1949, as amended."

(2) Section 3 of the Act of August 1, 1947, as amended (50 U. S. C. 159), is repealed.

(b) (1) Subsection (a) of section 1581 of title 10 of the United States Code is amended to read as follows:

"(a) The Secretary of Defense may establish not more than one hundred and twenty civilian positions in the Department of Defense, and not more than twenty-five civilian positions in the National Security Agency, to carry out research and development relating to the national defense, military medicine, and other activities of the Department of Defense and the National Security Agency, respectively, that require the services of specially qualified scientists or professional personnel."

(2) Subsection (b) of such section is amended by striking out "$10,000" and "$15,000" and by inserting "$12,500" and "$19,000", respectively, in lieu thereof.

SEC. 302. Section 2 of the Act of August 8, 1950 (50 U. S. C. 151c), is amended by striking out "supplies, equipment, aircraft, and aircraft parts" and inserting in lieu thereof the following: "any property (real or personal)".

85TH CONGRESS
2D SESSION

S. 3233

IN THE SENATE OF THE UNITED STATES

FEBRUARY 5, 1958

Mr. Yarborough (for himself, Mr. Mansfield, Mr. Hill, Mr. Sparkman, Mr. Carroll, Mr. Humphrey, Mr. Morse, and Mr. Proxmire) introduced the following bill; which was read twice and referred to the Committee on Interstate and Foreign Commerce.

A BILL To provide for the initiation and support of an inner and outer space study, research, and development program for peaceful uses in commerce and industry which shall include, but shall not be limited to, the assimilation, gathering, correlation, and dispersal of information and knowledge relating to, among other fields, weather and communications obtained from rocket ships, satellites, space vehicles, and other such mediums.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as "The Space Act of 1958."

FINDINGS AND DECLARATION OF PURPOSE

SEC. 101. The Congress hereby finds and declares that the national interest and national security of the United States require the fullest development of the uses of inner and outer space relating to communication, transportation, commerce, and weather study, the latter of these having been considered in hearing before the Interstate and Foreign Commerce Committee of the Senate starting March 26, 1957. On January 31, 1958, the United States of America in connection with the International Geophysical Year launched a space vehicle equipped with instruments of communication.

Daily summaries of current space vehicle trajectories that have been minutely clocked and mapped recently by United States Government agencies for earth circling vehicles indicate that cumulative serial trajectories and triangulations for communication channels and signals are and will continue to be of value to the scientific community of the world.

This Act is to initiate and to support programs of study, research, evaluation, and operation of (1) inner and outer space communication that relates in particular to weather recording, forecasting, and modifying programs, (2) interrelations of earth circling vehicles and other means of communication and the recording and allocating of channels and signals in order that coordinating means may be found and utilized with current programs and stations of the International Geophysical Year, and stations of the United States Government, and the stations of the various areas and States of the United States, and (3) programs of special reference for areas and States that have suffered from droughts, hail, lightning, fog, tornadoes, snow, freezes, and other weather phenomena which are of vital concern.

TITLE II. GENERAL PROVISIONS

NATIONAL SCIENCE FOUNDATION

SEC. 201. The National Science Foundation is authorized and directed to initiate and support this program of study, research, and evaluation and is hereby directed to immediately initiate the study of weather modification, giving particular attention to areas and States that have experienced floods, drought, hail, lightning, fog, tornadoes, snow, or other weather phenomena, and to report annually to the President and the Congress thereon. In conducting such studies, the Foundation shall consult with scientists in private life, with agencies of Government interested in or affected by such research. Research programs to carry out the purposes of this Act by the National Science Foundation, and by other Government agencies or departments, may be accomplished through contracts with, or grants to, private or public institutions or agencies, including but not limited to cooperative programs with any State through such instrumentalities as may be designed by the governor of such State.

ACCEPTANCE OF GIFTS AND SERVICES

SEC. 302. For the purposes of this Act, the Foundation is authorized to accept gifts and bequests: *Provided*, That if the donor so specifies, such gifts or bequests may be restricted or limited for use in connection with certain projects or areas. Other agencies of the Government are authorized to lend, without reimbursement, and the Foundation is authorized to receive, such property and personnel as may be deemed useful and necessary, with the approval of the Director of the Bureau of the Budget. In addition to the authority contained herein, the National Science Foundation, for the purposes of this Act, may utilize any of the powers granted by the National Science Foundation Act of 1950, as amended.

TITLE III. PROGRAMS AND STUDIES

INITIATION OF PROGRAMS AND STUDIES

SEC. 301. (a) The National Science Foundation in conformity with the other provisions of this Act, is authorized and directed to initiate programs and to coordinate such programs with other agencies of the Government.

(b) The National Science Foundation is further authorized to initiate, investigate, and coordinate such studies and programs to determine such changes as may be necessary in the International Table of Frequency Allocations (Atlantic City radio regulations, 1947). National frequency problems soluble within the framework of the present international allocations shall not be included in this inquiry. The program, among others, in conformity with the foregoing provision of this subsection shall include the allocation of radio frequencies which could be used on a nonclassified, nonmilitary, worldwide basis for the following communications—

(1) communications to and from earth encircling satellies and to and from earth (standard frequency services, fixed services, aeronautical navigation services);

(2) communications to and from vehicles in space to and from other vehicles in space (aeronautical radio navigation services, mobile services);

(3) communications to and from vehicles in space to and from earth (standard frequency services, fixed services, mobile services, and aeronautical navigation services); and

(4) communications to and from earth and to and from positions such as the moon (standard frequency services, fixed services).

TITLE IV. COORDINATOR

COORDINATOR OF SPACE INFORMATION

SEC. 401. There is hereby created within the National Science Foundation the position of Coordinator of Space Information whose duties shall be the carrying out of the provisions of this Act.

APPOINTMENT

SEC. 402. The Coordinator of Information shall be appointed by the President by and with the advice and consent of the Senate.

TITLE V. APPROPRIATIONS

SEC. 501. (a) The Advisory Committee on Weather Control is abolished thirty days after the effective date of this Act, and its functions, duties, and records and any unexpended funds shall be transferred to the National Science Foundation.

(b) There is hereby authorized to be appropriated to the National Science Foundation such amounts as may be necessary to carry out the purposes of this Act.

85TH CONGRESS
2D SESSION

S. 3604

IN THE SENATE OF THE UNITED STATES

APRIL 3, 1958

Mr. CASE of South Dakota introduced the following bill; which was read twice and referred to the Special Committee on Space and Astronautics

A BILL

To amend the Act of March 3, 1915, which established the National Advisory Committee for Aeronautics, and to establish the National Astronautics Agency, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Astronautics Act of 1958."

FINDINGS

SECTION 1. The Congress of the United States hereby makes the following findings regarding space research and technology:

(a) The advancing flight performance of unmanned vehicles has reached outside the atmosphere into nearby space and the exploration of space by manned vehicles will soon begin.

(b) The problem of space technology includes energy sources, propulsion, materials, structures, control, guidance, communications, environment, launching, recovery, and human limitations and requirements with respect to the flight of such vehicles.

(c) The urgency of an adequate national program of research and development leading to manned satellites, lunar, and interplanetary flight is now apparent in the public interest.

(d) An adequate national program must enlist the scientific and engineering resources of the nation and must include (1) research in space technology to provide data for the design of useful and efficient vehicles and to insure the success of manned space flight operations; (2) design and development of scientific and military space vehicles and their launching, flight, and recovery; and (3) research on the phenomena of the high upper atmosphere and nearby space, such as the character and distribution of mater, cosmic rays, solar radiation, electric, magnetic and gravitational fields, and scientific studies of the universe made possible by the use of satellites and space platforms as observation sites.

PURPOSE

SEC. 2. It is the purpose of this Act to effectuate the policies set forth above by providing for a program of conducting, assisting, and fostering space research and technology in order to encourage maximum scientific progress.

ORGANIZATION

SEC. 3. ORGANIZATION.—Public Law 271, Sixty-third Congress, approved March 3, 1915 (38 Stat. 930; 50 U. S. C. 151), as amended, which established the National Advisory Committee for Aeronautics, is amended to read as follows: "There is hereby established a National Astronautics Agency (hereinafter referred to as the 'Agency'). The Agency shall consist of a National Astronautics Board (hereinafter referred to as the 'Board') and a Director. The Board shall be composed of 17 members, appointed by the President, and they shall serve as such without compensation. The members of the Board shall include one representative each from and designated by the Department of Defense, Department of Commerce, Civil Aeronautics Administration, National Bureau of Standards, National Science Foundation, United States Weather Bureau, and one each from the Departments of the Army, Navy, and Air Force, and one representative from the National Academy of Sciences, and not more than seven other members appointed from private life by the President with the advice and consent of the Senate who shall be acquainted with the needs of aeronautical and astronautical sciences or skilled in aeronautical or astronautical engineering or allied sciences. Members not representing Government departments or agencies shall be appointed for staggered terms of five years from the date of expiration of the term of the member whom he succeeds, except that any member appointed to fill a vacancy oc-

curring prior to the expiration of a term shall be appointed for the unexpired term of the member whom he succeeds. There shall be a Chairman of the Board, elected annually from among the nongovernmental members by them."

SEC. 4. ANNUAL REPORT.—The Board shall render an annual report to the President for submission, on or before the fifteenth day of January of each year, to the Congress, summarizing the activities of the Agency and making such recommendations as it may deem appropriate.

SEC. 5. DIRECTOR.—There is hereby established within the Agency a Director. The Director shall be appointed by the Board, shall serve at the pleasure of the Board, shall be removable by the Board.

FUNCTIONS

SEC. 6. FUNCTIONS OF THE AGENCY.—The functions of the Agency are (1) to supervise and direct scientific study of the problems of flight of aircraft, including all aeronautical and astronautical vehicles, and (2) to direct and conduct research and experiment in aeronautics and astronautics in its own facilities, in laboratories or facilities as may be placed under its jurisdiction, and by contract with public and private organizations.

AUTHORITIES

SEC. 7. GENERAL AUTHORITY.—The Agency shall have the authority to do all things necessary to carry out the provisions of this Act within the limits of available appropriations, including, but not limited to, the following:

(a) To prescribe such rules and regulations as it deems necessary governing the manner of its operations and its organization and personnel;

(b) To enter into contracts or other arrangements or modifications thereof, for the carrying on, by organizations or individuals in the United States and foreign countries, including other Government agencies of the United States, of such aeronautical and astronautical activities as the Agency deems necessary to carry out the purposes of this Act;

(c) To acquire by purchase, lease, loan, or gift, and to hold and dispose of by sale, lease, or loan, real and personal property of all kinds necessary for or resulting from the exercise of authority granted by this Act;

(d) To receive and use funds donated by others, if such funds are donated without restrictions other than that they may be used in furtherance of one or more of the general purposes of the Agency;

(e) To accept and utilize the services of voluntary and uncompensated personnel and to provide transportation and subsistence as authorized by section 5 of the Act of August 2, 1946 (5 U. S. C. 73b-2) for persons serving without compensation.

MISCELLANEOUS PROVISIONS

SEC. 8. PERSONNEL.—The Director shall, in accordance with such policies as the Board shall from time to time prescribe, appoint and fix the compensation of such personnel as may be necessary to carry out the provisions of this Act. Such appointments shall be made in accordance with the provisions of Civil Service laws and regulations.

SEC. 9. TRANSFER OF PROPERTY.—The President, as he deems appropriate, may direct the transfer to the Agency of any real and personal property held by any Government department or agency.

SEC. 10. DEPARTMENT OF DEFENSE AND NATIONAL SCIENCE FOUNDATION.—Nothing in this Act shall be construed as limiting the Department of Defense, and its component agencies, in the development of military weapon systems, nor as limiting the National Science Foundation in supporting basic research generally.

SEC. 11. INCONSISTENT STATUTES.—All laws inconsistent with the provisions of this Act, as they pertain to the "National Advisory Committee for Aeronautics", or "NACA" herein renamed the "National Astronautics Agency", are hereby repealed.

All statutes, regulations, documents and records of the United States not inconsistent with the provisions of this Act, which refer to "National Advisory Committee for Aeronautics" or "NACA" shall apply to, and shall henceforth be considered to refer to, the "National Astronautics Agency."

85TH CONGRESS
2D SESSION

S. 3609

IN THE SENATE OF THE UNITED STATES

APRIL 14, 1958

Mr. JOHNSON of Texas (for himself and Mr. BRIDGES) (by request) introduced the following bill; which was read twice and referred to the Special Committee on Space and Astronautics

(also, H. R. 11881, Mr. McCormack; H. R. 11882, Mr. Arends; H. R. 11887, Mr. Haskell; and H. R. 11888, Mr. Keating)

This is the President's bill, see page 84 for text.

85TH CONGRESS
2D SESSION

S. 3126

IN THE SENATE OF THE UNITED STATES

JANUARY 27, 1958

Mr. HUMPHREY (for himself, Mr. MCCLELLAN, and Mr. YARBOROUGH) introduced the following bill; which was read twice and referred to the Committee on Government Operations

A BILL

To create a Department of Science and Technology; to establish National Institutes of Scientific Research; to authorize a program of Federal loans and loan insurance for college or university education in the physical or biological sciences, mathematics, or engineering; to authorize the establishment of scientific programs outside of the United States; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "Science and Technology Act of 1958".

TITLE I—DEPARTMENT OF SCIENCE AND TECHNOLOGY

ESTABLISHMENT

SEC. 101. There is hereby established an executive department of the Government to be known as the United States Department of Science and Technology hereinafter referred to as the "Department"), at the head of which shall be a Secretary of Science and Technology (hereinafter referred to as the "Secretary"), who shall be appointed by the President, by and with the advice and consent of the Senate, and shall receive compression at the rate provided by law for heads of the executive departments.

UNDER SECRETARY AND ASSISTANT SECRETARIES

SEC. 102. There shall be in the Department an Under Secretary of Science and Technology, such Assistant Secretaries as shall be determined by the President to be necessary, and a General Counsel, each of whom shall be appointed by the President, by and with the advice and consent of the Senate, shall perform such functions and duties as the Secretary may prescribe, and shall receive compensation at the rate provided by law for under secretaries (other than the Under Secretary of the Department of State), assistant secretaries, and general counsels, respectively, of the executive departments. The Under Secretary (or, during the absence or disability of the Under Secretary, or in the event of a vacancy in the office of the Under Secretary, an Assistant Secretary determined according to such order as the Secretary shall prescribe) shall act as Secretary during the absence or disability of the Secretary or in the event of a vacancy in the office of Secretary.

PROVISIONS OF LAW APPLICABLE TO THE DEPARTMENT

SEC. 103. Except to the extent inconsistent with this Act, all provisions of law applicable to the executive departments generally shall apply to the Department.

SEAL

SEC. 104. The Secretary shall cause a seal of office to be made for the Department, of such design as the President shall approve, and judicial notice shall be taken thereof.

DELEGATION OF AUTHORITY

SEC. 105. The Secretary may, without being relieved of his responsibility therefor, and unless prohibited by some specific provision of law, perform any function vested in him through or with the aid of such officials or organization entities of the Department as he may designate.

NATIONAL SCIENCE FOUNDATION

SEC. 106. The National Science Foundation, together with its personnel, property, records, obligations, commitments, and the unexpended balances of its appropriations, is transferred to the Department, where it shall exercise its functions subject to the supervision and direction of the Secretary.

TRANSFERS FROM THE DEPARTMENT OF COMMERCE

SEC. 107. (a) (1) All functions of the Secretary of Commerce with respect to the Patent Office are transferred to the Secretary.

(2) The Patent Office is transferred to the Department.

(b) (1) All functions of the Secretary of Commerce being administered through the Office of Technical Services in the Department of Commerce (including functions under the Act entitled "An Act to provide for the dissemination of technological, scientific, and engineering information to American business and industry, and for other purposes", approved September 9, 1950 (64 Stat. 823)), and any other functions of such Office, are transferred to the Secretary.

(2) Functions transferred to the Secretary under the provisions of this subsection shall be administered through a component of the Department to be known as the Bureau of Technical Services.

(3) The Bureau of Technical Services shall have responsibility for (a) the development of a complete science information program, utilizing all facilities of the Federal Government now vested in agencies which operate related programs; (b) to acquire, in cooperation with other public or private agencies, scientific literature, both from foreign and domestic sources; (c) to establish necessary facilities within the Bureau, or in other public or private agencies, to collate, declassify (subject to the requirements of section 5 of the Act of September 9, 1950 (64 Stat. 823)), translate, abstract, index, store, retrieve, and disseminate information essential to the development of scientific and technological programs as may be determined to be in the national interest and consistent with security requirements; and (d) to encourage the elimination of duplication of effort through the integration and coordination of functions vested in the Bureau and in other agencies: *Provided*, That the Bureau may supplement and support services provided by non-Government sources in the field of collecting, translating, or disseminating scientific information.

(4) The Bureau shall have the added responsibility for (a) the development and utilization of mechanical aids and new devices for collating, translating, abstracting, indexing, storage, and retrieval of scientific and technological information under the control of the Federal Government, and to coordinate such data as may be available from other sources; (b) to establish rules and regulations governing the distribution of publications as may be necessary to assure maximum utilization, including the assessment of such fees as may be deemed appropriate; and (c) to undertake through the facilities available to the Secretary, including educational or research institutions and private laboratories, the establishment of such additional services as may be required to further scientific, engineering, and technological research, and to aid in the development of inventions, discoveries, products, processes, and techniques.

(c) (1) The National Bureau of Standards is transferred to the Department and all functions of the Secretary of Commerce being administered through such Bureau are transferred to the Secretary.

(2) The Secretary shall establish a component of the Department separate from the National Bureau of Standards through which he shall administer the functions being carried out through the radio and cryogenic laboratories at Boulder, Colorado.

(d) All officers and other personnel, property, records, obligations, commitments, and unexpended balances of appropriations, allocations, and other funds, which the Director of the Bureau of the Budget determines are used primarily in relation to any office, bureau, or function transferred under the provisions of this section, are transferred to the Department.

ATOMIC ENERGY COMMISSION

SEC. 108. The Atomic Energy Commission, together with its personnel, property, records, obligations, commitments, and the unexpended balances of its appropriations, is transferred to the Department where it shall exercise its functions subject to the supervision and direction of the Secretary and shall be known as the Atomic Energy Administration of the Department of Science and Technology.

TRANSFERS FROM SMITHSONIAN INSTITUTION

SEC. 109. (a) The following functions of the Smithsonian Institution are transferred to the Secretary:

(1) All functions being administered through the Division of Astrophysical Research;

(2) All functions being administered through the Division of Radiation and Organisms;

(3) All functions transferred to such Institution under the provisions of part VIII of Reorganization Plan Numbered 3 of 1946 (relating to the Canal Zone Biological Area);

(4) All functions with respect to the exchange of scientific publications being administered through the International Exchange Service; and

(5) Any other functions of such Institution which are determined by the Director of the Bureau of the Budget to relate primarily to scientific research not related to museum or zoological purposes.

(b) All personnel, property, records, obligations, commitments, and unexpended balances of appropriations, allocations, and other funds, which the Director of the Bureau of the Budget determines are used primarily in relation to any function transferred under the provisions of this section, are transferred to the Department.

(c) Nothing in this section shall be deemed to authorize any transfer which in the opinion of the Attorney General cannot be made because of the provisions of a private bequest or other grant to such Institution.

TRANSFER MATTERS

SEC. 110. All laws relating to any agency or function transferred under this Act shall, insofar as such laws are not inapplicable, remain in full force and effect. Any transfer of personnel pursuant to this Act shall be without change in classification or compensation, except that this requirement shall not operate to prevent the adjustment of classification or compensation to conform to the duties to which such transferred personnel may be assigned. All orders, rules, regulations, permits, or other privileges made, issued, or granted by any agency or in connection with any functions transferred by this Act, and in effect at the time of the transfer, shall continue in effect to the same extent as if such transfer had not occurred, until modified, superseded, or repealed. No suit, action, or other proceeding lawfully commenced by or against any agency or any officer of the United States acting in his official capacity shall abate by reason of any transfer made pursuant to this Act, but the court, on motion or supplemental petition filed at any time within twelve months after such transfer takes effect, showing a necessity for a survival of such suit, action, or other proceeding to obtain a settlement of the questions involved, may allow the same to be maintained by or against the appropriate agency or officer of the United States.

EXPENDITURES AUTHORIZED

SEC. 111. The Secretary is authorized to make such expenditures (including expenditures for personal services and rent at the seat of government and elsewhere, for lawbooks, books of reference and periodicals, and for printing and

binding) as may be necessary to carry out the provisions of this Act, and as may be provided for by the Congress from time to time.

REPORTS TO CONGRESS

SEC. 112. The Secretary shall make at the close of each fiscal year a report in writing to Congress giving an account of all moneys received and disbursed by him and the Department, describing the work done by the Department, and making such recommendations as he shall deem necessary for the effective performance of the duties and purposes of the Department.

AMENDMENT

SEC. 113. Section 158 of the Revised Statutes of the United States, as amended (5 U. S. C. 1), is amended by inserting at the end thereof the following:
"Eleventh: The Department of Science and Technology."

APPROPRIATIONS AUTHORIZED

SEC. 114. There are authorized to be appropriated such sums as may be necessary to enable the Department to carry out the provisions of this Act and to perform any other duties which may be imposed upon it by law.

EFFECTIVE DATE

SEC. 115. The provisions of this title shall be effective on the date of enactment of this Act except that sections 106 through 110 shall be effective after ninety days following such date of enactment.

TITLE II—NATIONAL INSTITUTES OF SCIENTIFIC RESEARCH

DECLARATION OF POLICY AND PURPOSE

SEC. 201. The Congress finds that there is an urgent need for a greatly expanded program of scientific research in the United States if this Nation is to maintain its position of world leadership. The Congress finds further that the national interest requires that the United States Government afford creative scientists in the United States the environment and advanced facilities most conducive to the conduct of scientific research, either by means of the establishment of research centers, or by making available the funds, incentive, and encouragement necessary to enable the establishment or support of such centers through nonprofit organizations outside the Federal Government. It is the purpose of this title to encourage the establishment and support of scientific research centers for the conduct of basic and applied scientific research, as the national interest may require, through making possible adequate financial support to attract the most talented, qualified, and creative scientists in the Nation.

RESEARCH INSTITUTES FOR BASIC RESEARCH

SEC. 202. The Secretary is hereby authorized to establish, or to support the establishment of, one or more research centers or institutes in each of the following fields: Mathematics; engineering; the physical sciences, to include but not limited to, physics, chemistry, astronomy, geophysics, oceanography, and meteorology; the biological sciences; and the social sciences. Such research centers or institutes shall be devoted primarily to the conduct of basic scientific research, and may be operated by the Department directly or through support to private, nongovernmental institutions or agencies.

RESEARCH INSTITUTES FOR APPLIED RESEARCH

SEC. 203. Whenever the Secretary finds that the national interest clearly requires the undertaking of certain types of applied scientific research and that sufficient economic incentive does not exist for the undertaking of such research by nongovernmental organizations without governmental support, he may establish research institutes or support such applied research. Such research institutes may be operated either directly, or on a contract basis through nongovernmental organizations.

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REQUIREMENT

SEC. 204. No scientific research center or institute established or supported pursuant to this title shall be of a profit making character; nor shall any such research center or institute be established under this title if it would duplicate existing research facilities which are available for performing such work.

ADMINISTRATION

SEC. 205. Each research center or institute established and operated by the Department pursuant to this title shall be under the direction of a director appointed by the Secretary, who shall receive compensation at a rate not in excess of that provided for the Under Secretary of the Department. Each such director may, in accordance with such policies as the Secretary shall from time to time prescribe, appoint and fix the compensation of two associate directors and such other personnel as may be necessary. Scientific and professional personnel may be appointed and compensated without regard to the civil service laws and the Classification Act of 1949.

REPORTS BY DIRECTORS

SEC. 206. The directors of institutes established and operated by the Department pursuant to this title, shall report annually to the Secretary as to the research programs undertaken and planned within each such institute.

REPORTS BY SECRETARY

SEC. 207. The Secretary shall report annually to the Congress, for each preceding year, with respect to the research institutes established and supported, the nature of the programs undertaken, the cost of such programs, and the estimates of cost for each succeeding year.

TITLE III—SCHOLARSHIP LOANS

DEFINITIONS

SEC. 301. As used in this title—

(1) The term "Administrator" means the Administrator of Scientific and Technological Education, Department of Science and Technology;

(2) The term "Loan Director" means the Student Loan Director designated under this title;

(3) The term "State" means a State, Alaska, the Canal Zone, the District of Columbia, Hawaii, Puerto Rico, or the Virgin Islands;

(4) The term "institution of higher education" means a public or private nonprofit college or university; and

(5) The term "financial institution" means a financial or credit institution (including any insurance company) which is subject to examination and supervision by an agency of the United States or of any State.

ESTABLISHMENT OF LOAN AND LOAN INSURANCE PROGRAM

SEC. 302. (a) The Secretary shall establish a program providing for loans, and loan insurance, in accordance with the provisions of this title, for the purpose of encouraging and asssiting individuals to obtain education beyond the secondary school level in the fields of the physical sciences, to include but not limited to, physics, chemistry, astronomy, geophysics, oceanography, and meteorology, the biological sciences, mathematics, or engineering. The Secretary may establish priorities for such loans or loan insurance for education in particular fields whenever he determines such priorities are in the national interest.

(b) The provisions of this title shall be administered by the Administrator under the direction of the Secretary.

(c) The Secretary may establish a Bureau of Student Loans under this title to be headed by a Loan Director responsible to the Administrator to assist in carrying out the provisions of this title.

(d) The Secretary may establish such rules and regulations as are necessary to carry out the provisions of this title. In establishing such rules and regulations and in carrying out such provisions the Secretary shall consult and cooperate with State agencies primarily concerned with the higher education and with established associations of privately endowed colleges and universities.

FEDERAL LOAN AND LOAN INSURANCE FUND

SEC. 303. (a) There is hereby established in the Treasury a special fund to be known as the "Federal Education Loan and Loan Insurance Fund", which shall be used as a revolving fund for making loans under this title and for loan insurance under this title.

(b) There are authorized to be appropriated to the fund for direct loan purposes for the fiscal year beginning July 1, 1958, the sum of $40,000,000; for the fiscal year beginning July 1, 1959, the sum of $60,000,000; for the fiscal year beginning July 1, 1960, the sum of $80,000,000; for each of the fiscal years beginning July 1, 1961, 1962, 1963, and 1964, the sum of $100,000,000; and thereafter so much as shall be necessary to maintain the direct loan account in the revolving fund.

(c) There are authorized to be appropriated to the fund such amounts as are necessary for loan insurance purposes.

DISTRIBUTION AMONG STATES

SEC. 304. The Secretary shall provide for the distribution among the States of loans and loan insurance under the provisions of this title, in accordance with such formula as he determines from such information as may be reasonably available to him (1) to be best suited for the purposes of this title, and (2) to recognize the needs of each State based, among other criteria, on the number of students graduating from secondary schools, the number of young people in selected specific age categories between 17 and 21, the per capita income in such State, and the burden which the State is bearing in higher education through facilities, direct assistance, or otherwise.

DIRECT LOANS

SEC. 305. Loans made directly to individuals under the provisions of this title—

(1) shall be made in such numbers as may be possible with available funds;

(2) shall be made upon application in such form and containing such information as may be prescribed by the Secretary;

(3) shall be made only in cases where loans from private sources cannot be obtained on terms as favorable to the borrower; except, if study is to be made abroad this requirement need not be met;

(4) shall not exceed $1,500 for any academic year of education, and shall not be made for more than five such years of education, including postgraduate education at the discretion of the Secretary;

(5) shall be made only to individuals certified by an institution of higher education as acceptable for the course of study for which such loan is sought;

(6) shall be made without security; except that the borrower shall execute a promissory note payable to the United States, and if the borrower is a minor such note shall bear the endorsement of his or her parent or guardian;

(7) shall be due and repayable not later than ten years after the date on which the borrower ceases to pursue a full-time course of study at an institution of higher education on such terms as the Secretary may prescribe or shall be approved by him: *Provided*, That the first installment of repayment shall commence not later than one year after ceasing full-time study or such sooner time as the student shall accept full-time compensated employment;

(8) shall bear interest at 2 per centum per annum or such higher rate as shall be fixed by the Secretary; but no interest shall accrue prior to the commencement period of repayment or one year after ceasing full-time study, whichever is sooner;

(9) may be made in such installments as the Secretary deems appropriate, and in the event made in such installments, may be discontinued at any time the borrower fails to maintain satisfactory proficiency in the course of study for which the loan is made.

(10) shall not be made to any individual for any period during which he is receiving benefits under part VIII of Veterans Regulation Numbered 1 (a), title II of the Veterans' Readjustment Assistance Act of 1952, the War Orphan's Educational Assistance Act of 1956, or any Federal scholarship; and

(11) shall be used only to defray the costs, while pursuing a full-time course of study in the fields of the physical or biological sciences, mathematics, or engineering, at an institution of higher education, of tuition, fees, books, supplies, board, lodging, and other expenses necessary to the education being received at such institution.

CANCELLATION AND PAYMENT OF LOANS

SEC. 306. The Secretary may provide for the cancellation or payment of any loan made or insured under the provisions of this title if the borrower, upon completion of his course of study accepts full-time employment in the Federal Government, or employment on any project or program designated by the Secretary in the fields of the physical or biological sciences, mathematics, or engineering. Such loans shall be canceled or paid at the rate of $1,500 for each year in which the borrower is employed in a full-time position in the physical or biological sciences, mathematics, or engineering, in any agency of the Federal Government or on any project or program designated by the Secretary and as long as the borrower is so employed all interest on his loan shall be canceled or paid.

LOAN INSURANCE

SEC. 307. Loan insurance provided for under this title—

(1) may be provided for loans not in excess of a cumulative total of $1,000,000,000: *Provided*, That the Secretary shall recommend to the Congress such upward limit as he deems advisable after the first seven full years of operation of this program and periodically thereafter:

(2) shall provide for payment to financial institutions and institutions of higher education of 90 percentum of any losses suffered on loans;

(3) shall insure only loans meeting the requirements established for direct loans in clauses (4), (5), (7), (8), (9), (10), and (11) of section 405; provided that the Secretary shall make direct grants to financial institutions and institutions of higher education sufficient to cover the difference between the interest payable by the student over the period covered by the loan and the total interest which the institution receives or requires on similar loans;

(4) shall be without charge to the borrower or lender; and

(5) shall be subject to such additional terms, conditions, and requirements as the Secretary may determine to be necessary to protect the financial interests of the United States and to carry out the purposes of this title.

LIMITED SERVICE FEES

SEC. 308. Nothing in this title shall preclude an institution of higher education which loans money subject to insurance from charging a reasonable servicing charge under rules and regulations promulgated hereunder.

ACCEPTANCE OF GRANTS AND BEQUESTS

SEC. 309. The Secretary is authorized to accept gifts, grants, bequests, or devises for carrying out the purposes of this Act.

GRANTS TO STATES AND APPROPRIATIONS AUTHORIZED

SEC. 310. For the purpose of encouraging State assistance in facilitating the availability of loans to students in institutions of higher education engaged in a course of study in the fields of the physical or biological sciences, mathematics, or engineering, the Secretary is authorized to make direct grants of not more than $200,000 to any one State in any fiscal year which shall be kept in a separate fund under the control of the State agency charged with chief concern over institutions of higher education. Such funds shall be made available to help meet the organization and operating expenses of nonprofit corporations chartered for the principal purpose of providing loan programs for students of the State desiring to further their education beyond high school in the fields of the physical or biological sciences, mathematics, or engineering. There are authorized to be appropriated such amounts as may be necessary for the payments authorized in this section.

PROHIBITION OF FEDERAL CONTROL; AND ADMINISTRATION THROUGH STATE AGENCIES AND INSTITUTIONS

SEC. 311. (a) Nothing contained in this title shall be construed to authorize any department, agency, office, or employee of the United States to exercise any direction, supervision, or control over the curriculum or program of instruction of any educational institution or over its administration or personnel.

(b) So far as practicable, the Secretary shall provide for administration of loans through and in conjunction with the nonprofit corporations referred to in section 410, or when there is no such corporation, through the institution of higher education at which there are students participating in the program established by this title.

ADMINISTRATIVE APPROPRIATION AUTHORIZED

SEC. 312. There are authorized to be appropriated such amounts as may be necessary for the administration of this title.

TITLE IV—OVERSEAS PROGRAMS

AUTHORIZATION

SEC. 401. The Secretary is authorized to establish programs outside of the United States for collecting, collating, translating, abstracting, and disseminating scientific and technological information, and to conduct and support other scientific activities, including cooperative programs and projects between the United States and other countries. Notwithstanding section 1415 of the Supplemental Appropriation Act, 1953, or any other provision of law, the Secretary, in carrying out the provisions of this section, may, in cooperation with governmental and other agencies, use currencies, or credits for currencies, of any foreign government held or available for expenditure by the United States and not required by law or agreement with such government to be expended or used for any other purpose.

85TH CONGRESS

2D SESSION

S. 3180

IN THE SENATE OF THE UNITED STATES

JANUARY 28 (LEGISLATIVE DAY, JANUARY 27), 1958

Mr. KEFAUVER introduced the following bill; which was read twice and referred to the Committee on Government Operations

A BILL

To establish a United States Department of Science and to prescribe the functions thereof.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "Department of Science Act of 1958."

ESTABLISHMENT OF DEPARTMENT

SEC. 2. There is hereby established an executive department of the Government to be known as the United States Department of Science (hereinafter referred to as the "Department"), at the head of which shall be a Secretary of Science (hereinafter referred to as the "Secretary"), who shall be appointed by the President, by and with the advice and consent of the Senate, and shall receive compensation at the rate provided by law for heads of the executive departments.

UNDER SECRETARY AND ASSISTANT SECRETARIES

SEC. 3. There shall be in the Department an Under Secretary of Science, such Assistant Secretaries as shall be determined by the President to be necessary, and a General Counsel, each of whom shall be appointed by the President, by and with the advice and consent of the Senate, shall perform such functions and duties as the Secretary may prescribe, and shall receive compensation at the

rate provided by law for under secretaries (other than the Under Secretary of the Department of State), assistant secretaries, and general counsels, respectively, of the executive departments. The Under Secretary (or, during the absence or disability of the Under Secretary, or in the event of a vacancy in the office of the Under Secretary, an Assistant Secretary determined according to such order as the Secretary shall prescribe) shall act as Secretary during the absence or disability of the Secretary or in the event of a vacancy in the office of Secretary.

FUNCTIONS OF SECRETARY

SEC. 4. The Secretary is authorized to establish and carry out (1) such programs for developing missiles, rockets, and other means of conveyance to, and carrying on research in, outer space, and (2) such programs of research with respect to outer space, as he may determine to be in the national interest.

TRANSFERS FROM DEPARTMENT OF DEFENSE

SEC. 5. (a) There are transferred to the Secretary such functions of the Secretary of Defense and the Secretaries of the military departments of the Department of Defense as the President determines to relate primarily to the development of missiles and rockets not intended as weapons and to research into the problems of outer space.

(b) All personnel, property, records, obligations, commitments, and unexpended balances of appropriations, allocations, and other funds, which the Director of the Bureau of the Budget determines are used primarily in relation to any function transferred under the provisions of this section, are transferred to the Department.

NATIONAL SCIENCE FOUNDATION

SEC. 6. The National Science Foundation, together with its personnel, property, records, obligations, commitments, and the unexpended balances of its appropriations, is transferred to the Department where it shall exercise its functions subject to the supervision and direction of the Secretary.

ATOMIC ENERGY COMMISSION

SEC. 7. The Atomic Energy Commission, together with its personnel, property, records, obligations, commitments, and the unexpended balances of its appropriations, is transferred to the Department where it shall exercise its functions subject to the supervision and direction of the Secretary.

TRANSFER MATTERS

SEC. 8. All laws relating to any agency or function transferred under this Act shall, insofar as such laws are not inapplicable, remain in full force and effect. Any transfer of personnel pursuant to this Act shall be without change in classification or compensation, except that this requirement shall not operate to prevent the adjustment of classification or compensation to conform to the duties to which such transferred personnel may be assigned. All orders, rules, regulations, permits, or other privileges made, issued, or granted by any agency or in connection with any functions transferred by this Act, and in effect at the time of the transfer, shall continue in effect to the same extent as if such transfer had not occurred, until modified, superseded, or repealed. No suit, action, or other proceeding lawfully commenced by or against any agency or any officer of the United States acting in his official capacity shall abate by reason of any transfer made pursuant to this Act, but the court, on motion or supplemental petition filed at any time within twelve months after such transfer takes effect, showing a necessity for a survival of such suit, action, or other proceeding to obtain a settlement of the questions involved, may allow the same to be maintained by or against the appropriate agency or officer of the United States.

ADVISORY COMMITTEES

SEC. 9. The Secretary may establish such advisory committees on science as he may determine to be desirable and in furtherance of the purposes of this Act. The members of any such committee shall be reimbursed for actual travel and subsistence expenses incurred in attending meetings of the committee.

PROVISIONS OF LAW APPLICABLE TO THE DEPARTMENT

SEC. 10. Except to the extent inconsistent with this Act, all provisions of law applicable to the executive departments generally shall apply to the Department.

SEAL

SEC. 11. The Secretary shall cause a seal of office to be made for the Department, of such design as the President shall approve, and judicial notice shall be taken thereof.

DELEGATION OF AUTHORITY

SEC. 12. The Secretary may, without being relieved of his responsibility therefor, and unless prohibited by some specific provision of law, perform any function vested in him through or with the aid of such officials or organizational entities of the Department as he may designate.

EXPENDITURES AUTHORIZED

SEC. 13. The Secretary is authorized to make such expenditures (including expenditures for personal services and rent at the seat of government and elsewhere, for lawbooks, books of reference and periodicals, and for printing and binding) as may be necessary to carry out the provisions of this Act, and as may be provided for by the Congress from time to time.

REPORTS TO CONGRESS

SEC. 14. The Secretary shall make at the close of each fiscal year a report in writing to Congress giving an account of all moneys received and disbursed by him and the Department, describing the work done by the Department, and making such recommendations as he shall deem necessary for the effective performance of the duties and purposes of the Department.

AMENDMENT OF REVISED STATUTES

SEC. 15. Section 158 of the Revised Statutes of the United States, as amended (5 U. S. C. 1), is amended by inserting at the end thereof the following:
"Eleventh: The Department of Science."

APPROPRIATIONS AUTHORIZED

SEC. 16. There are authorized to be appropriated such sums as may be necessary to enable the Department to carry out the provisions of this Act and to perform any other duties which may be imposed upon it by law.

EFFECTIVE DATE

SEC. 17. The provisions of this Act shall be effective on the date of enactment except that sections 5, 6, 7, and 8 shall be effective after ninety days following such date of enactment.

85TH CONGRESS
2D SESSION

H. CON. RES. 265

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 10, 1958

Mr. KEATING submitted the following concurrent resolution; which was referred to the Committee on Foreign Affairs

(also, H. Con. Res. 268, Mr. Hillings)

CONCURRENT RESOLUTION

Whereas the paramount aim of United States foreign policy is to promote peace by all possible means; and

Whereas recent developments have demonstrated that outer space will be used increasingly by the nations of the world: and

Whereas the use of outer space poses great military dangers to the world but also promises untold treasures for peaceful uses: Now therefore, be it

Resolved by the House of Representatives (The Senate concurring), That the Congress of the United States express in strongest terms its desire that the regions of outer space be devoted to peaceful purposes. It is further the sense of Congress that the United States should continue to take the initiative and to press for devotion of outer space to peaceful purposes through the United Nations or by such other means as may be most appropriate. Such means may relate to, but need not be limited to—

(1) an international agreement barring the use of outer space for any military purpose;

(2) an international agreement that outer space and all outer space planetary and subplanetary masses are not subject to appropriation by any nation;

(3) adaption of an existing international organization or agency or formation of a new one for the joint exploration of outer space; and

(4) efforts to gain international agreement and cooperation on legal, jurisdictional, communications, navigation, and other problems concerning the use and control of outer space.

COMMITTEE HEARINGS AND REPORTS RELATED TO OUTER SPACE, 85TH CONGRESS, 2D SESSION: SELECTED REFERENCES

(Prepared by Frederick J. Rosenthal, Assistant Bibliographer, Legislative Reference Service, The Library of Congress)

United States Congress. Conference Committees, 1958. Supplemental military construction authorization act; conference report to accompany H. R. 9739. [Washington, U. S. Government Printing Office, 1958] 9 pages (85th Cong., 2d sess. House. Rept. No. 1329).

—— —— House. Committee on Appropriations. Department of Defense appropriations for 1959. Hearings before the Subcommittee of the Committee on Appropriations, House of Representatives, 85th Congress, 2d session. Overall policy statements. Washington, United States Government Printing Office, 1958. 611 pages.

—— —— —— —— Supplemental defense appropriation bill, 1958; report to accompany H. R. 10146. [Washington, U. S. Government Printing Office, 1958] 14 pages (85th Cong., 2d sess. House. Rept. No. 1288.

—— —— —— —— Supplemental defense appropriations for 1958. Hearings before the Subcommittee of the Committee on Appropriations, House of Representatives, 85th Congress, 2d sess. Washington, United States Government Printing Office, 1958. 389 pages.

—— —— —— Committee on Armed Services. Investigation of national defense missiles. Hearings before the Committee on Armed Services, House of Representatives, 85th Congress, 2d session, pursuant to House Resolution 67. January 13, 14, 15, 16, 17, 21, 22, 23, 24, 27, 28, 30, 31, February 3, 4, 5, 6, 7, 18, 19, 20, 21, 24, and 25, 1958. Washington, United States Government Printing Office, 1958. Pages 3973–4926. (Its Publication, 85th Cong., No. 71).

—— —— —— Committee on Interstate and Foreign Commerce. International Geophysical Year; the Arctic; Antarctica. Report of the Committee on Interstate and Foreign Commerce, House of Representatives, pursuant to section 136 of the Legislative Reorganization Act of 1946, Public Law 601, 79th Congress, and House Resolution 99, as amended, 85th Congress. Washington, United States Government Printing Office, 1958. 182 pages (85th Cong., 2d sess. House. Rept. No. 1348).

—— —— Senate. Committee on Appropriations. Second supplemental appropriation bill, 1958. Hearings before the Committee on Appropriations, United States Senate, 85th Congress, 2d session, on H. R. 10881, an act making supplemental appro-

priations for the fiscal year ending June 30, 1958, and for other purposes. Washington, United States Government Printing Office, 1958. 466 pages.

——— ——— ——— Second supplemental appropriation bill 1958; report to accompany H. R. 10881. [Washington, U. S. Government Printing Office, 1958] 39 pages. (85th Cong. 2d sess. Senate. Rept. No. 1344).

——— ——— ——— Supplemental defense appropriation bill 1958. Hearings before the Committee on Appropriations, United States Senate, 85th Congress, 2d session on H. R. 10146, an act making supplemental appropriations for the Department of Defense for the fiscal year ending June 30, 1958, and for other purposes. Washington, United States Government Printing Office, 1958. 136 pages.

——— ——— ——— Supplemental defense appropriation bill, 1958; report to accompany H. R. 10146. [Washington, U. S. Government Printing Office, 1958] 8 pages. (85th Cong. 2d sess. Senate. Rept. No. 1238).

——— ——— Committee on Armed Services. Authorizing the Secretary of the Air Force to establish and develop certain installations for the national security; report to accompany H. R. 9739. [Washington, U. S. Government Printing Office, 1958] 15 pages. (85th Cong. 2d sess. Senate. Rept. No. 1231).

——— ——— ——— Fiscal year 1958 supplemental military construction authorization (Air Force). Hearings before the Subcommittee on Military Construction, United States Senate, 85th Congress, 2d session, on H. R. 9739, an act to authorize the Secretary of the Air Force to establish and develop certain installations for the national security, and to confer certain authority on the Secretary of Defense, and for other purposes. January 21 and 24, 1958. Washington, United States Government Printing Office, 1958. 93 pages.

——— ——— ——— Inquiry into satellite and missile programs. Hearings before the Preparedness Investigating Subcommittee, United States Senate, 85th Congress, 1st and 2d sessions. November 25, 26, 27, December 13, 14, 16, and 17, 1957, January 10, 13, 15, 16, 17, 20, 21, and 23, 1958; part 1. Washington, United States Government Printing Office, 1958. 1,377 pages.

——— ——— ——— ——— Statement of the Senate Preparedness Subcommittee issued by Chairman Lyndon B. Johnson and Ranking Minority Member Styles Bridges at the direction of the Subcommittee. [Washington, 1958] mimeographed.

A CHRONOLOGY ON SPACE AND ASTRONAUTICS

Prepared by Catherine S. Corry, Research Assistant, Senior Specialists Division, Legislative Reference Service, The Library of Congress

1948

December 29: The First Report of the Secretary of Defense, James Forrestal, reported that the United States had been engaged in research on an earth satellite. The Report of the Executive Secretary of the Research and Development Board, contained as an appendix, stated:

"The Earth Satellite Vehicle Program, which was being carried out independently by each military service, was assigned to the Committee on Guided Missiles for coordination. To provide an integrated program with resultant elimination of duplication, the committee recommended that current efforts in this field be limited to studies and component designs; well-defined areas of such research have been allocated to each of the three military departments." [National Military Establishment, First Report of the Secretary of Defense, 1948, p. 129.]

1954

August 26: The Supplemental Appropriations Act, 1955 appropriated $2,000,000 to the National Science Foundation for carrying out the United States program for the International Geophysical Year. [Supplemental Appropriation Act, 1955, Public Law 663, 68 Stat. 818.]

October 4: The Special Committee of the International Geophysical Year concluded its meeting in Rome, Italy, during which it adopted the following recommendation:

"In view of the great importance of observations during extended periods of time of extraterrestrial radiations and geophysical phenomena in the upper atmosphere, and in view of the advanced state of present rocket techniques, CSAGI recommends that thought be given to the launching of small satellite vehicles, to their scientific instrumentation, and to the new problems associated with satellite experiments, such as power supply, telemetering, and orientation of the vehicle." [Special Committee of the International Geophysical Year. Meeting of the Special Committee of the International Geophysical Year, Rome, Sept. 30–Oct. 4, 1954. Part XI, p. 5.]

December 21: The Department of Defense in a two-sentence comment reported that studies continued to be made in the earth satellite vehicle program. The statement, approved by Secretary of Defense Charles E. Wilson, was issued after a press conference statement by the Secretary that he was unaware of an American satellite program. [New York Times, November 17, 1954, p. 15. Ibid., December 22, 1954, p. 10.]

1955

April 15: The Soviet newspaper, Vechernaya Moskva, announced that a commission for interplanetary communication, including physicist, Peter Kapitsa, had been created to develop an earth satellite, which would improve weather forecasting by taking photographs. [New York Times, July 30, 1955, pp. 1, 7.]

June 30: The Independent Offices Appropriation Act, 1956, appropriated "$10,000,000 to remain available until June 30, 1960." for the American International Geophysical Year program. [Independent Offices Appropriation Act, 1956, Public Law 112, 69 Stat. 208.]

July 29: The National Academy of Sciences and the National Science Foundation announced that the United States was planning to construct an earth satellite which would be launched during the International Geophysical Year. These organizations would sponsor the project with assistance from the Department of Defense which would furnish the equipment and facilities. The program was to be carried out under the IGY program and "the results obtained will be made available to the scientists of the world." A White House briefing on the announcement was given by James C. Hagerty and noted scientists, who discussed the scientific data which earth satellites would provide. They announced that the satellite would probably be the size of a basketball and might carry instruments; few other details of the vehicle were described. A letter from Joseph Kaplan, chairman of the United States National Committee for the International Geophysical Year, announcing the United States satellite plans in response to the October resolution of the Special Committee for the International Geophysical Year was delivered to Professor Sydney Chapmen, its president. [New York Times, July 30, 1955, pp. 8, 9.]

August 2. L. I. Sedov, chairman of the U. S. S. R. Academy of Sciences Interdepartmental Commission on Interplanetary Communications, made the following statement at a press conference during the International Congress of Astronauts, according to the Tass announcement: "In my opinion, it will be possible to launch an 'artificial satellite of the Earth' within the next two years, and there is a technological possibility of creating 'artificial satellites' of various sizes and weights." [Krieger, F. J. A casebook on Soviet astronautics. RM-1760, ASTIA Document Number AD 108750, June 21, 1956. (U. S. Air Force Project Rand, Research Memorandum), p. 2.]

1956

May 19: Under the Second Supplemental Appropriation Act, 1956, the National Science Foundation received an appropriation of "$27,000,000, to remain available until June 30, 1960" for the International Geophysical Year. [Second Supplemental Appropriation Act, 1956, Public Law 533, 69 Stat. 207.]

June 21: The Rand Corporation issued a research memorandum, A Casebooks on Soviet Astronautics, by F. J. Krieger. The case-

book contained both a bibliography of Soviet literature and complete translations of selected Russian articles and papers on this subject. [Krieger, F. J. A casebook on Soviet astronautics. RM-1760, ASTIA Document Number AD 108750, June 21, 1956. (U. S. Air Force Project Rand, Research Memorandum.)]

September 15: The Special Committee for the International Geophysical Year announced that among the resolutions approved by scientists from 40 countries, including the United States and the Soviet Union, were those recommending the use of standard instruments for tracking satellites and the release of technical information on tracking equipment by those countries with satellite programs. [New York Times, September 16, 1956, pp. 1, 30.]

December 8: The first test rocket in the American satellite program was fired by the Navy from the Air Force Missile Testing Center, Cocoa, Florida. A device carrying a radio transmitter, Minitrack, was ejected from the Viking rocket, which reached a 125-mile altitude. [New York Times, December 9, 1956, pp. 1, 79.]

1957

January 10: President Eisenhower in his State of the Union Message declared that "we are willing to enter any reliable agreement which would * * * mutually control the outer space missile and satellite development." [New York Times, January 11, 1957, p. 10.]

April 11: Satellite equipment, including a radio transmitter and instruments for measuring temperature, pressure, cosmic rays, and meteoric dust encounters, was tested above earth for the first time, as a rocket containing this equipment was fired by the Navy to a 126-mile altitude. [New York Times, April 12, 1957, pp. 1, 14.]

June: Observations on Radio Signals from the Artificial Terrestrial Satellite and their Scientific Value, an article by A. Kazantsev in Radio, reported that the first Russian satellite would contain two radio transmitters operating at about 20 and 40 megacycles and described the manner in which the signals from the transmitters would be emitted. [Kazantsev, A. Observations on radio signals from the artificial terrestrial satellite and their scientific value. Radio. Moscow, June 1957, pp. 17-19. (English translation.)]

June 10: The Soviet Union announced that it planned to launch satellites in a few months in a document sent to Lloyd V. Berkner, a reporter on rockets and satellites to the IGY. Contents of the report, which stated that the Soviet Union would launch 125 rockets, were made public at International Geophysical Year headquarters on June 21 and supplemented information supplied at a Soviet press conference June 18, 1957. [New York Times, June 23, 1957, p. 12.]

June 21: A Casebook on Soviet Astronautics—Part II by F. J. Krieger was issued by the Rand Corporation as a continuation of its research memorandum of June 21, 1956. [Krieger, F. J. A casebook on Soviet astronautics—Part II. RM 1922, ASTIA Document Number AD 133018, June 21, 1957. (U. S. Air Force Project Rand, Research Memorandum).]

July 1: The International Geophysical Year began. Sixty-four nations were to participate in the scientific program which would last for 18 months and would be carried out under a special committee of the International Council of Scientific Unons. [New York Times, July 1, 1957, pp. 1, 10.]

August 20: Major David G. Simons completed a 32-hour flight in a balloon, which reached a record altitude of over 100,000 feet and remained above 90,000 feet for 26 hours. The experiment tested man's adaptation to life at high altitudes through creation of an artificial atmosphere; cosmic radiation tests were also made. [New York Times, August 21, 1957, pp. 1, 17.]

August 28: The Supplemental Appropriation Act, 1958 appropriated $34,200,000 for the United States Scientific Satellite "to be derived by transfer from such annual appropriations available to the Department of Defense as may be determined by the Secretary of Defense, to remain available until expended." [Supplemental Appropriation Act, 1958, Public Law 170, 71 Stat. 428.]

October 4: The Soviet Union launched the first earth satellite, Sputnik I. Spherical in shape with a diameter of 22.8 inches, this 184 pound satellite circled the world in an initial time of 96.2 minutes. Its orbit was elliptic with an altitude range from 145 to 560 miles and was inclined at an angle of 65 degrees to the equatorial plane. Sputnik I carried two radio transmitters operating at 20.005 and 40.002 megacycles. [New York Times, October 5, 1957, p. 3. *Ibid.*, March 27, 1958, p. 15.]

October 5: Resolutions of an international conference on rockets and satellites provided for continuation of internationally coordinated research in these fields beyond the International Geophysical Year. Both American and Russian scientists were present at the conference. [New York Times, October 6, 1957, p. 45.]

October 9: President Eisenhower in a White House press release congratulated the Soviet scientists on Sputnik I. He gave a brief history of the development of the United States satellite program and pointed to the separation of Project Vanguard from work on ballistic missiles. [The Department of State Bulletin, October 28, 1957, pp. 673, 674.]

October 14: The American Rocket Society presented to President Eisenhower a program for outer space development formulated after months of study. It proposed establishment of an Astronautical Research and Development Agency similar to the National Advisory Committee for Aeronautics and the Atomic Energy Commission, which would have responsibility for all space projects except those directly related to the military. The report contained a schedule of proposed space projects and pointed out the benefits which would accrue from them. [New York Times, December 5, 1957, p. 5.]

November 3: Sputnik II, carrying a dog, Laika, was launched by the Soviet Union. According to the Tass announcements, the "containers with apparatus" of this rocket-shaped satellite weighed 1,120 pounds, and it contained "instruments for studying solar radiation in the short wave ultraviolet and X-ray regions of the spectrum, instruments for cosmic ray studies, instruments for studying the temperature and pressure, an airtight container with

an experimental animal (a dog), an air conditioning system, food and instruments for studying life processes in the conditions of cosmic space, measuring instruments for transmitting the results of scientific measurements to the earth, two radio transmitters operating on frequencies of 40,002 and 20,005 kilocycles and the necessary power sources." It had an initial orbit time of 103.7 minutes and a maximum altitude of 1,056 miles. [New York Times, November 4, 1957, p. 8. Ibid., March 27, 1958, p. 15.]

November 7: President Eisenhower in a radio and television address on science and security announced that scientists had solved the problem of re-entry and showed the nose cone of a missile which was intact after a flight through outer space. He announced the creation of the office of Special Assistant to the President for Science and Technology and the appointment of Dr. James R. Killian, president of the Massachusetts Institute of Technology, to the new post. [New York Times, November 8, 1957, p. 10.]

November 8: Secretary of Defense McElroy directed the Department of the Army to make preparations for launching a satellite with the Jupiter–C test rocket and thus supplement the existing Vanguard program. William M. Holaday, Assistant to the Secretary of Defense for Guided Missiles, was given authority for coordinating this project with the overall satellite program. [New York Times, November 9, 1957, p. 2.]

November 13: President Eisenhower, in a speech on future security, proposed adoption of a formula for decisions on undertaking space projects, which would include the following criteria:

"If the project is designed solely for scientific purposes, its size and its cost must be tailored to the scientific job it is going to do."

"If the project has some ultimate defense value, its urgency for this purpose is to be judged in comparison with the probable value of competing defense projects." [New York Times, November 14, 1957, p. 14.]

November 15: William M. Holaday, special assistant to the Secretary of Defense, was named Director of Guided Missiles by Secretary of Defense McElroy. Under terms of the Defense Department directive: "The Director of Guided Missiles will direct all activities in the Department of Defense relating to research, development, engineering, production, and procurement of guided missiles." In his press conference Secretary McElroy disclosed that the Department of Defense was thinking of establishing a centralized organization which would handle both outer space and anti-missile-missile projects. [Department of Defense news release No. 1110–57. New York Times, November 16, 1957, pp. 1, 2.]

November 21: The Rocket and Satellite Research Panel proposed the creation of a National Space Establishment in the executive branch of the Government. Under civilian leadership but cognizant of defense requirements, this establishment would carry out a unified program of space research in its own facilities and by contract. [U. S. Congress. Senate. Committee on Space and Astronautics, Compilation of materials on space and astronautics, March 27, 1958. No. 1, pp. 14–16.]

——— The board of directors of the National Advisory Committee for Aeronautics authorized establishment of a special committee on space technology. This committee would both supervise and help formulate a space research program and would be assisted by specialized subcommittees. [Christian Science Monitor, January 11, 1958, p. 5.]

November 25: The Preparedness Investigating Subcommittee of the Senate Committee on Armed Services began extensive hearings on the Nation's satellite and missile programs. Approximately 70 experts appeared before the Subcommittee during the course of these hearings, and written testimony was submitted by about 200 others. [Congressional Record, January 23, 1958, p. 805. U. S. Congress. Senate. Committee on Armed Services. Preparedness Investigating Subcommittee. Inquiry into satellite and missile programs. Hearings, November 25, 1957–January 23, 1958. Part 1.)]

December 4: The American Rocket Society's proposal for an Astronautical Research and Development Agency, which was presented to President Eisenhower on October 14, 1957, was announced. Commander Robert C. Truax, president of the Society, stated that he felt $100,000,000 a year would be required at first for the astronautical agency. [New York Times, December 5, 1957, p. 5.]

December 6: A mechanical failure in the propulsion system of a Vanguard rocket caused it to burst into flames two seconds after it was fired in an attempt by the Navy to launch a 6.4 inch test satellite. [New York Times, December 7, 1957, pp. 1, 8. Ibid., December 10, 1957, p. 7.]

December 10: A Directorate of Astronautics was established by the Air Force to manage and coordinate astronautical research programs, including work on satellites and anti-missile weapons. Brig. Gen. Homer Boushey was named to head the board. [New York Times, December 12, 1957, p. 7.]

December 13: The order creating a Directorate of Astronautics was suspended by William H. Douglas, Secretary of the Air Force, as creation of such a group before establishment of the proposed Advanced Research Projects Agency was felt to be premature. [New York Times, December 14, 1957, p. 8.]

December 14: Maj. Gen. John B. Medaris, Commander of the Army Ballistic Missile Agency, in testifying before the Senate Prepardness Investigating Subcommittee stated: "Because I have no responsibility to carry this out, I think I can say in open meeting that it is my personal opinion unless this country can command 1 million pounds of thrust by 1961, we will not be in pace * * * we will not be in the race." [U. S. Congress. Senate Committee on Armed Services. Preparedness Investigating Subcommittee. Inquiry into satellite and missile programs. Hearings, November 25, 1957–January 23, 1958. Part I, p. 562. Reported in New York Times, December 15, 1957, pp. 1, 42.]

1958

January 4: Sputnik I disintegrated. [New York Times, January 21, 1958, p. 14.]

——— The American Rocket Society and the Rocket and Satellite Research Panel issued a summary of their proposals for a Na-

tional Space Establishment. Preferably independent of the Department of Defense, but in any event not under one of the military services, this establishment would be responsible for the "broad cultural, scientific, and commercial objectives" of outer space development. A timetable of the achievements necessary for attaining United States leadership in space technology was included in the document. [U. S. Congress. Senate. Special Committee on Space and Astronautics. Compilation of materials on space and astronautics, March 27, 1958. No. 1, pp. 17–19.]

January 9: In his State of the Union Message, President Eisenhower reported: "In recognition of the need for single control in some of our most advanced development projects, the Secretary of Defense has already decided to concentrate into one organization all antimissile and satellite technology undertaken within the Department of Defense." [New York Times, January 10, 1958, p. 8.]

January 12: President Eisenhower, in answering the December 10, 1957, letter of Soviet Premier Nikolai A. Bulganin regarding a summit conference and disarmament, proposed that the Soviet Union and the United States "agree that outer space should be used only for peaceful purposes." This proposal was compared with the 1948 offer of the United States to cease production of nuclear weapons and dedicate atomic energy to peaceful uses, an offer which was not accepted by the Soviet Union. [New York Times, January 13, 1958, p. 6.]

——— James H. Doolittle, chairman of the National Advisory Committee for Aeronautics, announced the authorization of a special committee on space technology on November 21, 1957. H. Guyford Stever was to head the committee. [Christian Science Monitor, January 11, 1958, p. 5.]

January 13: In his Budget Message to Congress, President Eisenhower stated that in his request: "Funds are provided for an expanded research and development effort on military satellites and other outer space vehicles and on antimissile missile systems, to be carried out directly under the Secretary of Defense." The budget for fiscal year 1959 showed that $340,000,000 in new obligational authority was being asked for the Advanced Research Projects Agency. No new authorizations were sought for the International Geophysical Year, but estimated obligations for earth satellite exploration of the upper atmosphere under this program were $8,139,834 for fiscal year 1958 and $21,000 for fiscal year 1959. [New York Times, January 14, 1958, pp. 18, 19. The Budget for Fiscal Year 1959, pp. 101, 169, 438.]

January 13: Secretary of Defense Neil H. McElroy, in testifying before the House Armed Services Committee, stated:

"Such long-range programs as the antimissile missile and the military satellite programs are in the research and exploratory development stages. They are important and must be pursued, but they must not distract us from the speedy development of our other missile systems. To handle them, I am establishing within the Department of Defense an Advanced Research Projects Agency, which will be responsible to the Secretary of Defense

for the unified direction and management of the antimissile missile program and for outer space projects. I would expect to assign other special projects of this general nature to this agency from time to time in the future. [U. S. Congress. House of Representatives. Committee on Armed Services. Investigation of national defense missiles. Hearings, no. 71, p. 3981.]

January 14: Senator Lyndon B. Johnson in an address before Columbia Broadcasting System affiliates in Washington, D. C., urged the United States "to demonstrate its initiative before the United Nations by inviting all member nations to join in this adventure into outer space together." Growth of America's space research program and establishment of a government agency for its direction were also demanded by Johnson as part of the nation's answer to the Soviet challenge. [Congressional Record, January 16, 1958, pp. 551–553.]

January 16: Representative Carl T. Durham, chairman of the Joint Committee on Atomic Energy, announced the establishment of a Special Subcommittee on Outer Space Propulsion with Senator Clinton P. Anderson as chairman. [Congressional Record, January 16, 1958, p. D23.]

January 22: Nikita S. Khrushchev in a speech at Minsk, Byelorussia, stated that the Eisenhower proposal to dedicate outer space to peaceful purposes was an attempt of the United States to ban weapons it did not possess and to protect itself from those weapons which would harm its own territory. [New York Times, January 26, 1958, pp. 1, 2. Ibid., February 18, 1958, p. 8.]

January 23: Membership of the Special Subcommittee on Outer Space Propulsion of the Joint Committee on Atomic Energy was announced:

Senators: Clinton P. Anderson, chairman, Henry M. Jackson, Albert Gore, Bourke B. Hickenlooper, John W. Bricker.

Representatives: Chet Holifield, Melvin Price, James E. Van Zandt, James T. Patterson.

[Congressional Record, January 23, 1958, p. D41.]

January 23: Senator Clinton P. Anderson in a speech before Congress explaining his bill, S. 3117, proposed that control of the nation's outer space program be given to the Atomic Energy Commission. He stressed that such a decision would save needed time and would give control to an established civilian agency with extensive laboratories. Senator Anderson pointed out that nuclear propulsion should play an essential part in space technology. [Congressional Record, January 23, 1958, pp. 813–817.]

——— Senator Lyndon B. Johnson read a statement unanimously adopted by the Senate Preparedness Investigating Subcommittee at the conclusion of its hearings. Largely concerned with guided missile development, it stated that the Russian satellite program "demonstrates beyond question that the Soviet Union has the propulsive force to hurl a missile from one continent to another." The American program since the launching of Sputnik I was reviewed, and the report made seventeen recommendations for American security, including:

"Start work at once on the development of a rocket motor with a million-pound thrust."

"Accelerate and expand research and development programs, provide funding on a long-term basis, and improve control and administration within the Department of Defense or through the establishment of an independent agency." [Congressional Record, January 23, 1958, pp. 805–807.]

January 27: Hugh L. Dryden, director of the National Advisory Committee for Aeronautics, delivered a speech, Space Technology and the NACA, to the Institute of the Aeronautical Sciences. Stressing the importance of a well-planned and logical space program embracing both civilian and military uses, Dryden pointed to the organization of the NACA for both military and nonmilitary aeronautical research and reviewed the Committee's work in space research since World War II. He related the view expressed by the NACA at its January 16, 1958, meeting that the national space program should be under the joint control of the Department of Defense, the NACA, the National Academy of Sciences, and the National Science Foundation; in addition to research flights, the NACA would "coordinate and conduct research in space technology in its own laboratories and by contract in support of both military and nonmilitary projects." [Congressional Record, March 3, 1958, pp. A1902–A1904.]

January 31: The first American satellite, Explorer I, was launched by the Army using a modified Jupiter-C rocket. Weighing 30.8 pounds, the satellite and final stage rocket was 80 inches long and 6 inches in diameter. It carried 11 pounds of instruments for gathering data on skin and internal temperature, cosmic dust erosion, and cosmic rays; two radio transmitters of 108.03 and 108.00 megacycles sent this information to earth. The satellite had an initial orbit time of 114.5 minutes and a maximum altitude of 1,587 miles. Its orbit was inclined at a 34-degree angle to the equatorial plane. Explorer I had an expected lifetime of several years. [New York Times, February 1, 1958, p. 7A. Ibid., March 27, 1958, p. 15.]

February 3: Soviet Premier Nikolai A. Bulganin in a letter to President Eisenhower stated that the Soviet Union "is ready to examine also the question of the intercontinental rockets if the Western powers are willing to reach agreement to ban atomic and hydrogen weapons, to end tests thereof, and to liquidate foreign military bases in other nations' territories. In that case, an agreement on the use of outer space for peaceful purposes only would unquestionably meet no difficulties." [New York Times, February 4, 1958, p. 8.]

——— Scientists at the California Institute of Technology reported that initial data from Explorer I showed that cosmic radiation on its orbit did not exceed twelve times the amount on earth and thus appeared to pose no great threat to travel in this region. In addition, no positive evidence of encounter with meteoritic particles had been found. [New York Times, February 4, 1958, pp. 1, 16.]

February 4: Republican Congressional leaders were informed that President Eisenhower had directed James R. Killian, Jr., to study and make recommendations on the governmental organization of the nation's space and missile program. [New York Times, February 5, 1958, pp. 1, 12.]

February 5: The second trial firing of a Vanguard test satellite failed as defects in the first-stage engine control system caused the rocket to veer to the right and break in two about sixty seconds after launching. The rocket was destroyed by the range safety officer at the Air Force Missile Test Center, Cape Canaveral, Florida. [New York Times, February 5, 1958, pp. 1, 12. Ibid., February 6, 1958, pp. 1, 12.]

February 6: The Senate passed S. Res. 256, creating a Special Committee on Astronautical and Space Exploration to frame legislation for a national program of space exploration and development. [Congressional Record, February 6, 1958, pp. 1551–1553.]

February 7: The Advanced Research Projects Agency was established by the Department of Defense, and Roy W. Johnson, a vice president of General Electric Company, was appointed by Secretary of Defense McElroy as its director. ARPA was placed in charge of the nation's outer space program, including the development of military space weapons, and was made responsible for anti-missile missile projects. William H. Holiday, Director of Guided Missiles, was to transfer responsibilities in these fields to Mr. Johnson. [New York Times, February 8, 1958, pp. 1, 8; Dept. of Defense news release No. 109-58.]

February 10: The following Senators were named to the Senate Special Committee on Space and Astronautics: Lyndon B. Johnson, Styles Bridges, Richard B. Russell, Leverett Saltonstall, Clinton P. Anderson, Bourke B. Hickenlooper, Theodore Francis Green, Alexander Wiley, John L. McClellan, Karl E. Mundt, Warren G. Magnuson, John W. Bricker, Stuart Symington. [Congressional Record, February 10, 1958, p. 1636.]

——— Senator Michael J. Mansfield urged the members of the North Atlantic Treaty Organization to take the initiative in exploring space on a cooperative basis. Other nations who wished "to participate in good faith" would be included in this international undertaking. Senator Mansfield also recommended that the United States should propose extending the International Geophysical Year "into a decade of worldwide scientific cooperation." [Congressional Record, February 10, 1958, pp. 1669–1674.]

February 11: The Supplemental Defense Appropriation Act, 1958, stated: "The Secretary of Defense is authorized to transfer not exceeding $10,000,000, to remain available until expended, from any appropriations available to the Department of Defense for the current fiscal year for such advanced research projects as he may designate and determine. * * *" It was provided that current fiscal year appropriations for related programs might be transferred to and merged with this appropriation, and that amounts of this appropriation might be transferred to other appropriations for advanced research under the Department of Defense. [Supplemental Defense Appropriation Act, 1958, Public Law 322, 72 Stat. 7.]

February 12: Public Law 325 gave the Department of Defense authority to participate in advanced research projects, including space projects. Section 7 read in part:

"The Secretary of Defense or his designee is authorized to engage in such advanced projects essential to the Defense Department's responsibilities in the field of basic and applied research

and development which pertain to weapons systems and military requirements as the Secretary of Defense may determine after consultation with the Joint Chiefs of Staff; and for a period of one year from the effective date of this Act, the Secretary of Defense or his designee is further authorized to engage in such advanced space projects as may be designated by the President." [Public Law 325, 72 Stat. 13, 14.]

February 13: The National Society of Professional Engineers proposed establishment of a Federal Space Exploration Commission to undertake and have unified responsibility for a program of space exploration. The commissioners would be appointed by the President, and the civilian commission "would be able to give the military services adequate opportunity for rocket and missile development—as consistent with the defining of service roles at the highest policy level." [U. S. Congress. Senate. Special Committee on Space and Astronautics. Compilation of materials on space and astronautics, March 27, 1958. No. 1, pp. 20-22.]

February 14: Basic Objectives of a Continuing Program of Scientific Research in Outer Space, a report by the Technical Panel on the Earth Satellite Program of the United States National Committee for the International Geophysical Year was published. The report proposed a program of space research extending beyond the International Geophysical Year. It outlined the technical investigations which should be made by sounding rockets, lightweight and advanced satellites, lunar probes, planetary and interplanetary research, and manned space flight, and gave a detailed description of the scientific information which could be gained from these experiments. [Science, April 11, 1958; U. S. Congress. Senate. Special Committee on Space and Astronautics. Compilation of materials on space and astronautics, March 27, 1958. No. 1, pp. 23-44.]

February 16: Airman Donald G. Farrell completed a week's isolation in a space cabin at Randolph Air Force Base in an experiment testing atmospheric equipment for space flight and the effects of this artificial environment on man's working ability. [New York Times, February 16, 1958, p. 26; Ibid., February 17, 1958, pp. 1, 16.]

February 17: In a letter to Soviet Premier Nikolai A. Bulganin, President Eisenhower repeated his plea for the dedication of outer space to peaceful uses. Denying that this proposal was intended "to gain strategic advantages for the United States," he stressed the urgency of dealing with outer space before its use for military purposes had, like nuclear weapons, advanced to the point where complete international control was almost impossible. [New York Times, February 18, 1958, p. 8.]

February 20: Senator Lyndon B. Johnson was elected chairman of the Senate Special Committee on Space and Astronautics. [Congressional Record, February 20, 1958, p. D123.]

February 21: According to the Soviet Geophysical Year Committee, the Russians fired to a 294-mile altitude a rocket containing 1½ tons of instruments for measuring the ion composition of the atmosphere, electronic temperature, air pressure, encounters with micrometeorite particles, the ultraviolet sector of the spectrum, and the concentrations of free electrons in the ionosphere and of positive ions. [Christian Science Monitor, April 12, 1958, p. 2.]

March 5: Explorer II was launched but did not go into orbit because of failure of the final rocket to ignite. Unable to achieve the required velocity, it re-entered the atmosphere and was probably burned up before falling into the Atlantic Ocean. [New York Times, March 6, 1958, pp. 1, 10. *Ibid.*, March 7, 1958, pp. 1, 8.]

——— H. Res. 496, passed by the House of Representatives, established a Select Committee on Astronautics and Space Exploration to investigate the problems of outer space and to submit recommendations for the control and development of astronautical resources. Congressmen appointed to the Committee were: John W. McCormack, chairman, Overton Brooks, Wayne L. Hays, Leo W. O'Brien, Lee Metcalf, William H. Natcher, B. F. Sisk, Joseph W. Martin, Jr., Leslie C. Arends, Gordon L. McDonough, James G. Fulton, Kenneth B. Keating, Gerald R. Ford, Jr. [Congressional Record, March 5, 1958, pp. 3019, 3020.]

——— The following appointments to the Advanced Research Projects Agency were announced by the Department of Defense: Rear Admiral John E. Clark, USN, Deputy Director; Lawrence P. Gise, Director, Program Control and Administration; Lambert L. Lind, Special Assistant to the Director. [Department of Defense news release No. 197-58.]

March 7: George J. Feldman, New York attorney, was appointed staff director and chief counsel of the House Select Committee on Astronautics and Space Exploration. [New York Times, March 8, 1958, p. 20.]

March 9: Harold E. Stassen, in an address on foreign policy, urged the United States "to express willingness to join in a United Nations Space Development Agency which would endeavor as a United Nations project to send the first man into space and to send the first inspection photographic satellite around the earth." [Washington Post and Times Herald, March 10, 1958, pp. A1, A6.]

March 15: In a Foreign Ministry statement the Soviet Union proposed that banning the use of outer space for military purposes, as suggested by President Eisenhower, be coupled with the liquidation of foreign military bases on the territories of other countries, especially in Europe, the Middle East, and North Africa. An international program for space research would be established under the control of the United Nations and each country would pledge to launch rockets only under this program. A new United Nations agency for international cooperation in research on cosmic space would develop this space program, continue the International Geophysical Year research program on a permanent basis, and serve as a clearing house and coordinator for national research. [New York Times, March 16, 1958, p. 34.]

March 17: Vanguard I, a test sphere weighing 3.25 pounds, was launched by the Navy at Cape Canaveral, Florida. The 6.4 inch satellite carried two radio transmitters, one of which was powered by six solar batteries. Vanguard I had a maximum altitude of 2,466 miles and a five to ten year expected lifetime. [New York Times, March 18, 1958, pp. 1, 14. Ibid. March 27, 1958, p. 15.]

——— An experiment testing the behavior of crews under conditions of long confinement was concluded at Wright Air Development Center, as five Air Force officers ended a five day simulated space flight. [New York Times, March 18, 1958, p. 16.]

March 18: The Institute for Defense Analyses, a nonprofit corporation serving the Department of Defense, announced the formation of an Advanced Research Projects Division and the appointment of Dr. Herbert F. York as its head. In this capacity Dr. York would serve as Chief Scientist for the Defense Department's Advanced Research Projects Agency. He had been director of the University of California Radiation Laboratory at Livermore, California. [Department of Defense news release No. 250-58; New York Times, March 19, 1958, p. 1.]

March 24: Senator Lyndon B. Johnson, chairman of the Senate Special Committee on Space and Astronautics, made the following staff appointments: Glen P. Wilson, coordinator of technical information; Eilene Galloway, special consultant. [Washington Post and Times Herald, March 25, 1958, p. A7.]

March 25: Senator Lyndon B. Johnson announced the following appointments to the Senate Special Committee on Space and Astronautics: Edwin L. Weisl, consulting counsel; Cyrus R. Vance, consulting counsel; Homer Joe Stewart, scientific consultant. [Congressional Record, March 25, 1958, pp. 4605, 4606.]

March 26: President Eisenhower in a brief statement made public the President's Science Advisory Committee's report, Introduction to Outer Space; an Explanatory Statement. This report set forth the basic factors making the advancement of space technology a national necessity and explained to the nontechnical reader the principles and potentialities of space travel. The many uses of space technology for scientific and military purposes were summarized, and a timetable for carrying out these objectives was included. [Congressional Record, March 26, 1958, pp. 4909–4912; U. S. Congress. Senate. Special Committee on Space and Astronautics. Compilation of materials on space and astronautics, March 27, 1958. No. 1, pp. 45–53.]

——— Explorer III was launched by the Army and followed an unplanned orbit, which caused it to pass closer to the earth and probably lessened its life expectancy. It gathered the same data as Explorer I, but its high powered transmitter recorded cosmic ray data on a tape recorder which played back the information on signal to ground recording stations. Weighing 31 pounds, its antenna system differed from that of Explorer I. [New York Times, March 27, 1958, pp. 1, 15. Christian Science Monitor, March 27, 1958, p. 3.]

March 27: President Eisenhower gave his approval to the plans for outer space exploration announced by Secretary of Defense Neil H. McElroy. The Advanced Research Projects Agency was to undertake several space projects including the launching of earth satellites and lunar probes. The Air Force Ballistic Missile Division was authorized by ARPA to carry out three lunar probes with a Thor-Vanguard system, and one or two lunar probes utilizing the Jupiter-C rocket were assigned to the Army Ballistic Missile Agency. A mechanical ground scanning system for lunar investigations was to be developed by the Naval Ordnance Test Station, China Lake, California. [New York Times, March 28, 1958, p. 8.]

——— Charles S. Sheldon II was named assistant director of the House Select Committee on Astronautics and Space Exploration.

April 2: President Eisenhower in a message to Congress proposed the establishment of a National Aeronautics and Space Agency into which the National Advisory Committee for Aeronautics would be absorbed. This agency was to have responsibility for civilian space science and aeronautical research. It would conduct research in these fields in its own facilities or by contract and would also perform military research required by the military departments. Interim projects pertaining to the civilian program which were under the direction of the Advanced Research Projects Agency would be transferred to the civilian space agency. A National Aeronautics and Space Board, appointed by the President and composed of eminent persons outside the Government and representatives of interested Government agencies (with at least one member from the Department of Defense), was to assist the President and the director of the National Aeronautics and Space Agency. [New York Times, April 3, 1958, p. 14; Congressional Record, April 2, 1958, pp. 5489, 5490.]

——— The original budget request of $340,000,000 in new obligational authority for the Advanced Research Projects Agency for fiscal year 1959 was raised to $520,000,000 for advanced research projects in a letter from the Director of the Bureau of the Budget, Maurice H. Stans, which was transmitted to Congress by President Eisenhower. [Amendments to budget for fiscal year 1959 involving increases for Department of Defense military functions, House Document 364, April 2, 1958.]

April 5: S. Fred Singer, physics professor at the University of Maryland, was named Head, Scientific Evaluation Consultants of the House Select Committee on Astronautics and Space Exploration. [Washington Star, April 6, 1958, p. A21.]

April 13: Sputnik II plunged to earth. [Washington Post and Times Herald, April 15, 1958, p. A3.]

April 14: The proposal for a National Aeronautics and Space Agency drafted by the Bureau of the Budget was contained in the following Congressional bills:

S. 3609, Senator Lyndon B. Johnson; H. R. 11881, Representative John W. McCormack; H. R. 11882, Representative Leslie C. Arends; H. R. 11887, Representative Harry G. Haskell, Jr.; H. R. 11888, Representative Kenneth B. Keating. [Congressional Record, April 14, 1958, pp. 5631, 5661.]

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