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FEASIBILITY STUDY REGIONAL AEROSPACE MUSEUM

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HEARINGS BEFORE THE AD HOC SUBCOMMITTEE ON H.R. 10771 OF THE COMMITTEE ON SCIENCE AND ASTRONAUTICS U.S. HOUSE OF REPRESENTATIVES

NINETY-FIRST CONGRESS

SECOND SESSION

JULY 16, 1970

[No. 22]

Printed for the use of the
Committee on Science and Astronautics



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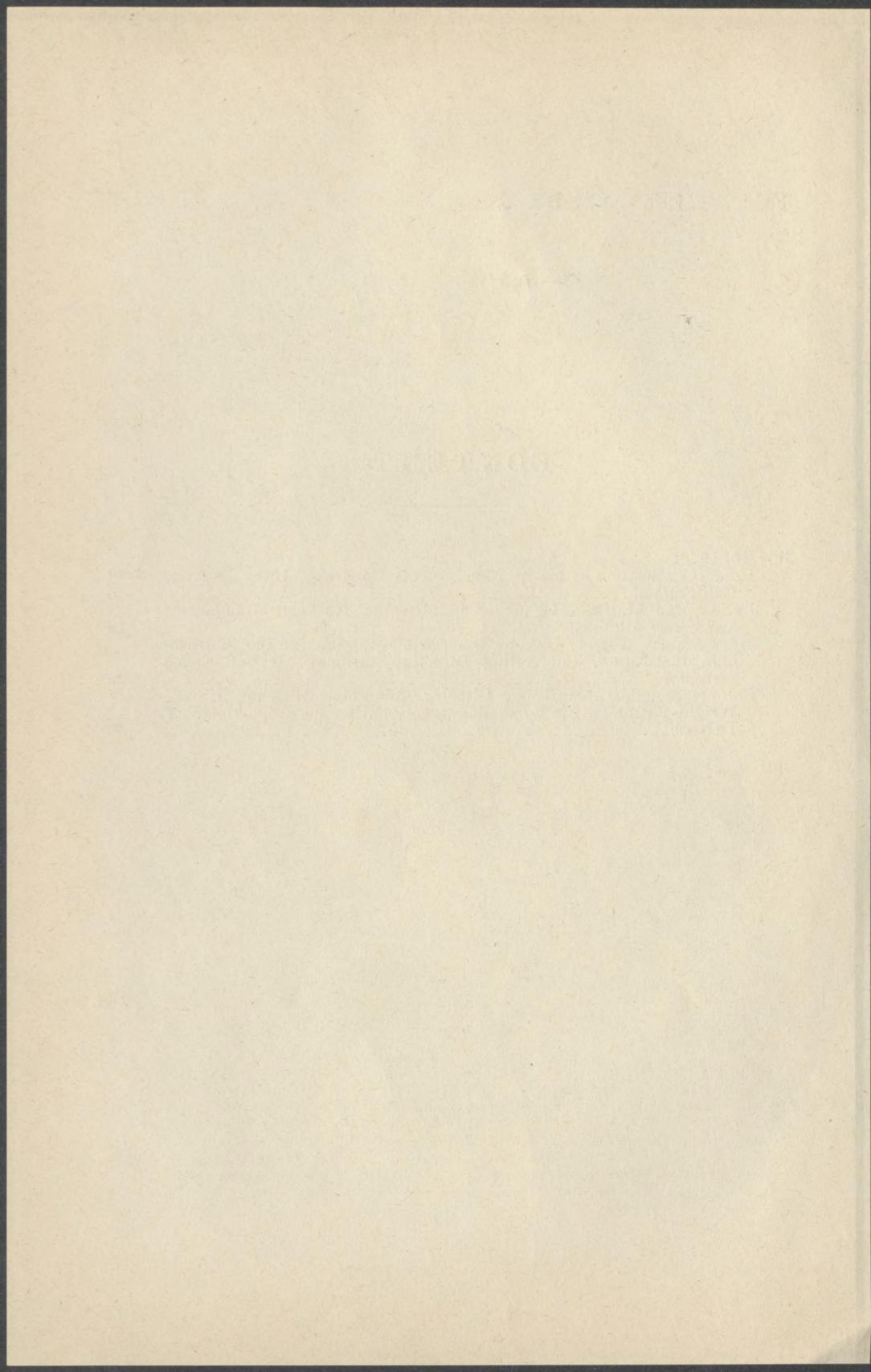
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(III)



FEASIBILITY STUDY REGIONAL AEROSPACE MUSEUM

THURSDAY, JULY 16, 1970

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND ASTRONAUTICS,
AD HOC SUBCOMMITTEE,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10 a.m., in room 2318, Rayburn House Office Building, Hon. Olin E. Teague (chairman of the subcommittee) presiding.

Mr. TEAGUE. The committee will come to order. We are convened today to receive testimony on the bill H.R. 10771, which would provide for a study to determine the feasibility of establishing, in Western United States, an aerospace museum.

Without objection, I am going to place in the record the order appointing this special subcommittee, a copy of the bill, and the departmental reports from Smithsonian, NASA, and the Defense Department.

(The reports above referred to are as follows:)

COMMITTEE ON SCIENCE AND ASTRONAUTICS,
HOUSE OF REPRESENTATIVES,
Washington, D.C., July 6, 1970.

MEMORANDUM

To: Hon. Olin E. Teague, Hon. Joseph E. Karth, and Hon. James G. Fulton.
From: Chairman George P. Miller.

Addressees are hereby appointed to an ad hoc Subcommittee for the purpose of considering the bill H.R. 10771, which would require NASA to conduct a full and complete investigation and study of the advisability of establishing an aerospace museum in Western United States.

Mr. Teague will serve as Subcommittee Chairman and schedule such hearings as may be required.

Upon completion of deliberations on said bill, the Chairman of the Subcommittee is requested to report findings and recommendations to the Full Committee for further consideration.

[H.R. 10771, 91st. Cong., 1st sess.]

A BILL To provide that the Administrator of the National Aeronautics and Space Administration shall investigate and report to the Congress as to the advisability of establishing a permanent National Aeronautics and Space Administration Aerospace Museum

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Administrator of the National Aeronautics and Space Administration shall make a full and complete investigation and study of the advisability of establishing, in the Western United States, a permanent National Aeronautics and Space Administration Aerospace Museum in order to preserve historical items related to United States aerospace activities and to communicate to the public information concerning past, present, and future aerospace activities of the United States.

SEC. 2. The Administrator shall, within the two-year period beginning on the date of enactment of this Act, report to the Congress the results of the investigation and study conducted under the first section of this Act, together with such recommendations as he may deem appropriate. Such report shall contain specific findings with respect to (1) the recommended location of the proposed National Aeronautics and Space Administration Aerospace Museum, (2) the recommended physical size and design of the proposed museum, and (3) the estimated total cost of establishing the proposed museum, and (4) the economic feasibility of establishing such a museum.

SMITHSONIAN INSTITUTION,
Washington, D.C., March 20, 1970.

HON. GEORGE P. MILLER,
Chairman, Committee on Science and Astronautics, U.S. House of Representatives, Washington, D.C.

DEAR MR. MILLER: I have taken a great deal of interest in H.R. 10771, a bill before your committee "To provide that the Administrator of the National Aeronautics and Space Administration shall investigate and report to the Congress as to the advisability of establishing a permanent National Aeronautics and Space Administration Aerospace Museum." I would like to take this opportunity to present to you our views on this, which we have discussed with Dr. Paine and others in the National Aeronautics and Space Administration, and with the Bureau of the Budget.

The bill proposes a study by the National Aeronautics and Space Administration Administrator of two propositions: first, that NASA establish a national space museum; second, that the museum be located in the Western United States. It is the consensus of the Smithsonian Institution Board of Regents that since the National Air and Space Museum has already been established, a second national space museum should not be created by NASA. It was suggested, however, that if Congress should determine, upon the basis of the proposed study and report, that a space museum should be built for the Western region, it should be a branch or affiliate of the National Air and Space Museum. In consultation with the NASA Administrator, the Smithsonian would willingly undertake the proposed study, if the necessary funding can be provided by NASA. I understand that NASA is willing to assist the Smithsonian in any way necessary.

The bill calls for a feasibility study, with specific recommendations as to location, size, design, and cost of a memorial to the American space effort which might be erected in the Western part of the country. It could also deal with the question whether this regional facility should be a branch of, or merely affiliated with, the National Air and Space Museum within the Smithsonian.

Provision for funding the study should be made. The Regents have not authorized the use of the Smithsonian's quite limited funds for this purpose. NASA has indicated it will assist Smithsonian in the undertaking. To insure that adequate funds are available, the bill should contain an authorization for appropriations for the proposed study.

Since it is so directly germane to this subject, there follows a short summary of the legislative history and actual work carried out to date on the National Air and Space Museum and its relationship with NASA.

The Congress has already directed that the national development of flight shall be memorialized; that air and space objects of historical and scientific significance shall be preserved and displayed; and that educational material for the study of air and space history and development shall be provided. (20 U.S.C. 77a.) This action is the culmination of 23 years of Congressional encouragement and legislative action in the interest of air and space science and history.

With the Act of August 12, 1946 (P.L. 79-722; 60 Stat 997; 20 U.S.C. 77), the Congress established the National Air Museum as a part of the Smithsonian Institution. The Congress included provisions for selecting a site for a National Air Museum building to be located in the Nation's Capital. By the Act of September 6, 1958, the Congress designated a site for a building to be on the Mall from Fourth Street to Seventh Street, Independence Avenue to Jefferson Drive. Planning appropriations in the amount of \$511,000 and \$1,364,000 were made available to the Smithsonian by the Congress for the fiscal years 1964 and 1965, respectively, and have been expended.

In 1966 the Congress enacted P.L. 89-509 (80 Stat. 310) authorizing the actual construction of the National Air and Space Museum. The Board, with whose advice the Museum is administered, was expanded to include the Administrator of the National Aeronautics and Space Administration, the Chief of Staff of the Air Force, the Chief of Naval Operations, the Chief of Staff of the Army, the Commandant of the Marine Corps, the Commandant of the Coast Guard, the Administrator of the Federal Aviation Agency, the Secretary of the Smithsonian Institution, and three citizens appointed by the President. (20 U.S.C. 77(a)) Plans and specifications for the proposed museum building are completed. Construction itself awaits only an appropriation, which will be sought in the near future, as soon as military expenditures in Vietnam have been substantially reduced. This will consummate the successive Congressional authorizations for this national museum in the Nation's Capital.

This Museum within the Smithsonian will add a new dimension in research in air and space science, technology, and history. For the first time in our Nation's history these developments and achievements of national importance will become fully accessible in the Nation's Capital to the scholar and to the general public.

Functioning as a center of exposition and education, the building will provide capacity both for large numbers of visitors and for a comprehensive array of air and spacecraft, instrumentation, engines, models, and historical reference documents. Exhibitions will be changed periodically and a series of most timely presentations will continually be on display. The building design will provide excellent flexibility for its functional requirements. The location on the Mall as designated by the Congress is most appropriate, being immediately adjacent to the other Smithsonian Institution museums where it will be most convenient to the crowds of visitors. The location is adjacent, also, to the headquarters of the National Aeronautics and Space Administration and the Federal Aviation Agency.

In March 1967 the Administrator of the National Aeronautics and Space Administration and the Secretary of the Smithsonian Institution executed an agreement concerning the custody and management of NASA historical artifacts, pursuant to 20 U.S.C. 77d. The agreement, after identifying aerospace artifacts that are significant specimens for preservation and exhibit, established a procedure for transfer of title of such artifacts to the National Air and Space Museum when their "technical utility" is exhausted. The agreement further placed upon the National Air and Space Museum the responsibility to acquire, preserve, and display these aerospace artifacts in the museum and on loan. Finally, an initial fund was established to start the project.

For more than two years the National Air and Space Museum has been acquiring, preparing for exhibit, and displaying significant aerospace artifacts. Mercury, Gemini, and two Apollo spacecraft have been transferred to the National Air and Space Museum along with astronaut spacesuits, rocket motors, training simulators, and hundreds of related items and associated documentation, such as spacecraft technical manuals. Tens of thousands of photographs have been delivered and organized into a chronological file.

Flown manned spacecraft and spacesuits are on loan from the National Air and Space Museum to NASA and are on display at NASA centers and other appropriate locations in the United States. Gemini and Apollo spacecraft are currently touring Europe and the Far East either on a museum-to-museum basis or in cooperation with the U.S. Information Agency and the Department of Commerce. Future schedules are firm in Europe and the Far East through 1970. Meanwhile, exhibit plans and philosophy for communicating the story of the history of aerospace, contemporary accomplishment, and trends of future programs are being developed both in-house and under consultant contract.

We would urge that the National Air and Space Museum be supported by granting the current authorization for construction of its splendid building on the Mall before other regional facilities of a similar nature are planned. Should a regional facility be deemed appropriate and feasible, such a museum would likely best operate in affiliation with the existing National Air and Space Museum. This would allow the Western museum, if built, to benefit from valuable administrative support already built up in Washington. This support includes experience with exhibits, historical and scientific research, and, not least, access

through loans to the vast collections already in the possession of the National Air and Space Museum. But it seems quite clear that work on any regional affiliated museum should await completion of the National Air and Space Museum Building on the Mall.

The Bureau of the Budget has advised that, from the standpoint of the Administration's program, there is no objection to the submission of this report to the Congress.

Sincerely yours,

S. DILLON RIPLEY, *Secretary.*

DEPARTMENT OF THE AIR FORCE,
Washington, March 19, 1970.

HON. GEORGE P. MILLER,

Chairman, Committee on Science and Astronautics, House of Representatives.

DEAR MR. CHAIRMAN: Reference is made to your request to the Secretary of Defense for the views of the Department of Defense with respect to H.R. 10771, 91st Congress, a bill "To provide that the Administrator of the National Aeronautics and Space Administration shall investigate and report to the Congress as to the advisability of establishing a permanent National Aeronautics and Space Administration Aerospace Museum". The Department of the Air Force has been designated to express the views of the Department of Defense.

The purpose of the bill is to investigate the advisability of establishing a permanent National Aeronautics and Space Administration Aerospace Museum. The investigation would be conducted by the Administrator of the National Aeronautics and Space Administration and consider the Museum's location in the western United States. Historical items related to United States aerospace activities would be preserved by the Museum, and information concerning such activities would be communicated to the public. The report of the results of the Administrator's investigation and his specific findings with respect to the location, size and design, total cost, and economic feasibility of establishing a museum would be made to Congress within two years from the date of enactment of this Act.

While the Department of Defense is interested in the preservation of aerospace historical items, this matter more directly involves NASA and the Smithsonian Institution; consequently, the Department of Defense defers to those agencies.

The Department of Defense interposes no objection to the enactment of H.R. 10771.

This report has been coordinated within the Department of Defense in accordance with procedures prescribed by the Secretary of Defense.

The Bureau of the Budget advises that, from the standpoint of the Administration's program, there is no objection to the presentation of this report for the consideration of the Committee.

Sincerely,

PHILIP N. WHITTAKER,
Assistant Secretary of the Air Force (Installations and Logistics).

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION,
Washington, D.C., March 2, 1970.

HON. GEORGE P. MILLER,

*Chairman, Committee on Science and Astronautics,
House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: This is in further response to Mr. Charles Ducander's letter of May 2, 1969, requesting NASA's comments on H.R. 10771, "To provide that the Administrator of the National Aeronautics and Space Administration shall investigate and report to the Congress as to the advisability of establishing a permanent National Aeronautics and Space Administration Aerospace Museum."

The bill would require that the Administrator of the National Aeronautics and Space Administration make a study of the advisability of establishing, in the Western United States, a permanent National Aeronautics and Space Administration Aerospace Museum in order to preserve historical items related to United States aerospace activities, and to report the results to the Congress within two years from the enactment of H.R. 10771. Such a report would contain specific findings regarding the recommended location, size and design of the proposed Museum, and the estimated cost and economic feasibility of establishing such a museum.

The National Air Museum, Smithsonian Institution, was established by the Act of August 12, 1946 (60 Stat. 997, 20 U.S.C. 77), and Congress authorized the preparation of plans for a permanent building for that museum, to be located on Independence Avenue between 7th and 4th Streets, S.W., Washington, D.C. by the Act of September 5, 1958 (72 Stat. 1794, 20 U.S.C. 77b note). The Department of the Interior and Related Agencies Appropriations Act, 1965 (78 Stat. 273, 289), appropriated \$1,364,000 for the preparation of plans for the museum. However, money for actual construction of the new quarters has not yet been appropriated.

20 U.S.C. 77 was amended by the Act of July 19, 1966, Public Law 89-509 (80 Stat. 310), changing the name of the National Air Museum to the National Air and Space Museum, and including the Administrator of the National Aeronautics and Space Administration or his designee on the board of the museum.

Specifically, 20 U.S.C. 77 (b) now reads:

"That the Regents of the Smithsonian Institution are hereby authorized and directed to prepare plans, including drawings and specifications, and to construct a suitable building for a National Air and Space Museum (with requisite equipment, approaches, architectural landscape treatment of the grounds, and connections with public utilities and the Federal heating system) for the use of the Smithsonian Institution, to be located on that part of reservation which is bounded by Fourth Street Southwest on the east, Seventh Street Southwest on the West, Independence Avenue on the South, and Jefferson Drive on the north, title to which is in the United States."

The legislation establishing the National Air and Space Museum apparently contemplates one museum to be located in Washington. NASA feels that there would be merit in having a museum in the Western part of the nation, thereby making artifacts related to the national space program more accessible to citizens from the Western states. It would be especially appropriate in view of the outstanding contributions that many Western states, notably California, have made to aerospace research and development. However, we believe that authorization for such a museum should be contingent upon the appropriation of construction funds for the National Air and Space Museum in Washington. Further, we consider the Smithsonian Institution, which has primary responsibility for the preservation of historical artifacts, to be the most appropriate agency to conduct the feasibility study contemplated in the bill. Naturally, we would assist the Smithsonian in any way necessary to assure the successful completion of the study.

The National Aeronautics and Space Administration would, therefore, interpose no objection to H.R. 10771, if it were amended to provide that the Director of the Smithsonian Institution, in collaboration with the Administrator of NASA, shall investigate fully the advisability of establishing a space museum in the Western United States. It is recommended that the existing legislation providing for the National Air and Space Museum be taken carefully into account in such a study, and that any legislation designed to establish a second space museum provide for the common administration of both museums by the Smithsonian in order that there be consistent handling and display of artifacts relating to the space program.

The Bureau of the Budget has advised that, from the standpoint of the Administration's program, there is no objection to the submission of this report to the Congress.

Sincerely yours,

ROBERT F. ALLNUTT,
Assistant Administrator
(For Legislative Affairs).

MR. TEAGUE. Our first witness is the Hon. Charles S. Gubser, sponsor of the bill. We will be glad to hear your statement, Mr. Gubser.

**STATEMENT OF HON. CHARLES S. GUBSER, MEMBER OF CONGRESS,
TENTH DISTRICT, CALIFORNIA**

MR. GUBSER. With your permission, I will file a statement for the record but summarize it informally.

This bill I have introduced for myself, Congressman Don Edwards, Congressman Paul N. McCloskey, Congressman Jerry L. Pettis, and

Congressman Alphonzo Bell. The measure calls for a study to determine the feasibility of an aerospace museum to be constructed in the Western United States.

I used the words "Western United States" because I did not want to advance this idea in a provincial sense. If it were the Pacific coast or a specific State, it certainly would be acceptable to me, but I confess to you very frankly, that the idea brings a mental image in my mind of a specific museum at a specific place.

I became interested in this when the original idea was presented to me by Mr. Charles Kubokawa of the NASA Ames Laboratory research staff who conceived the idea for such a museum which would be tailored to the landmark dirigible hangar at Moffett Field Naval Air Station. It would be a self-supporting museum where aerospace artifacts would be displayed.

Just to give you some idea of what Mr. Kubokawa's idea is, perhaps you can envision the dirigible hangar which once housed the Macon. Visitors would enter the exhibits through a real gantry, go across a catwalk and then wend their ways always downward around a series of exhibits. The bottom of the floor of the hangar would contain a full moonscape, full-size rockets, and they would leave the exhibit through a theater in the circular doors of the hangar, a theater which could seat a great many people and which could be used as a scientific center for meetings of scientists the world over.

This site is next to Ames Laboratory at Moffett Field. It would have an aerospace library in it as well as the artifacts which would tell the history of aerospace and the part that the West played in it.

Before I go further, I want to acknowledge the presence of Mr. Kubokawa. I asked that he support me in this testimony so that if there are any questions he could explain his ideas. But I repeat, these ideas are not for the purpose of promoting the museum at Moffett Field. This is only an example of what could be done if the committee and those in charge decide to go ahead with the idea.

In passing, I might say as I have told many of you privately, Mr. Kubokawa has the distinction of being one of the first five NASA aquanauts who spent 30 days under water in the Virgin Islands.

I need not tell you, Mr. Chairman, that there is no aerospace museum outside of Washington, D.C., and you all know what the western part of the United States has contributed to the aerospace industry. We feel that this could well be a self-supporting tourist attraction which would have great scientific import.

I would like to emphasize that my view is that this is not just a museum, it would be an aerospace library and a locale for major scientific meetings and symposiums. It could become a true scientific mecca.

If it were to be located at Moffett Field, it would be near three major universities in the heart of an aerospace and electronic center, and it would be adjacent to Ames Laboratory. It would be in an area where scientific meetings could be held in an intellectual climate which, in my opinion, would be very close to perfection.

With your permission, I would like to ask Mr. Kubokawa some of the ideas that he advanced to me. For example, it is his opinion that this museum could actually pay for itself in an 8-year period of time.

Charlie, would you mind just informally—

Mr. TEAGUE. Let me ask you two or three questions. As I understand the charter of the Smithsonian, they are charged with responsibility for national museums. Was there some specific reason that you wanted NASA to do it?

Mr. GUBSER. I must admit it was probably an oversight. I certainly agree that this should be conducted by the Smithsonian, but I would point out that NASA would have a definite stake in it and there would have to be cooperation. However, this would be a museum, yes, and, as such, should be under the jurisdiction of the Smithsonian. But it would also be a scientific center where we would have an aerospace library and where we would also have aerospace meetings, so I think the thing could be done cooperatively under the direction of the Smithsonian.

Mr. TEAGUE. You don't mention money in your bill.

Mr. GUBSER. No, I don't believe that this is a terribly expensive procedure, and though I recognize that the NASA budget has been cut back considerably, I am hoping that this type of study in cooperation with the Smithsonian could be done in-house at very little expense and absorbed out of current appropriations.

Mr. TEAGUE. Why 2 years for the study?

Mr. GUBSER. Two years is merely something that I put in as a matter of convenience. It is my understanding that this could be done in a considerably shorter period of time, but I wanted to err on the side of being conservative and allowing enough time.

Mr. TEAGUE. Are you looking at this as strictly a NASA museum or as a branch of the Smithsonian or what?

Mr. GUBSER. I didn't originally, but I think now I would have to say that this properly belongs under Smithsonian direction, with cooperation between the Smithsonian and NASA.

Mr. TEAGUE. Thank you.

Mr. GUBSER. If it meets with your approval—I think, Mr. Kubokawa, you have worked out a very rough estimate on financial feasibility that this could pay for itself?

Mr. KUBOKAWA. This is correct.

Mr. GUBSER. In what way?

Mr. KUBOKAWA. I would, first of all, have admission to get into this museum. I am positive that the taxpayers on a whole would support things like this, but I think it is unfair to charge people who will not actually be visiting. If you have a lot of international guests, I think they should also be charged too, because they are using the facilities.

If other museums can charge for admission, I don't see why we cannot. I don't think it is right to burden the taxpayers year after year for the upkeep of the museum.

Mr. GUBSER. I have submitted to the committee counsel a study conducted by Mr. Kubokawa in which he mentions the number of visitors that go to the Houston and Marshall and Kennedy Space Centers. I have an article from Aviation Weekly which states in 1968, they recorded 660,000 visitors taking the tour at Kennedy and they projected for 1969 1,543,000—91 percent of those visitors come from outside the State of Florida.

Mr. Kubokawa, do you have anything you would like to add to my testimony regarding the thing which you envision at Moffett Field and its use as a scientific mecca as well as a museum?

Mr. KUBOKAWA. Yes. For instance, your aerospace library. There is not a single aerospace library, as such, in the whole of the United States, and with the modern methods of using a computerized type of library operation, I think this would be, as Congressman Gubser says, a mecca for aerospace information.

I feel that the California area is quite apropos in this respect because of the fact that the man on the first manned flight lived in Santa Clara County and the reentry space capsule design was done at Ames Center. This is something to be proud of.

Mr. GUBSER. One last question I would like to address to Mr. Kubokawa, with the chairman's permission.

In a conversation earlier today you made the statement to me that many of the very significant models which have been tested in the tunnels at Ames Laboratory are, for want of storage space, actually out in the sun deteriorating at the present time. I understand that models of several designs for the supersonic transport are out in the sun.

Are those deteriorating, and could they be preserved as significant scientific items in a museum of this type?

Mr. KUBOKAWA. Yes, some of the designs of the supersonic transports, as you know, are not acceptable after the first wind tunnel testing because they may prove to have unwanted lift-to-drag ratios and things like this, therefore they are cast aside or sometimes picked up at a later date to test in the wind tunnel again.

If we have this type of storage area where the mockups could be kept, I think in the long run it would be of less cost to the Government to place it in a storage house that would be well accepted by the taxpayer as a museum piece and at the same time be ready for wind tunnel operations.

Mr. GUBSER. Mr. Chairman, one last statement.

Of course, this would be a fact which would be assessed during the period of study and this statement is probably premature. However we do know that we are experiencing a number of military base closures across the country, and I think that when this study is made, it is entirely possible, although certainly we can't predict it, that an existing installation which is going to be phased out could be utilized better by reducing the cost and allowing us to reconp a considerable Federal investment for this very worthwhile purpose.

Mr. Chairman, those are the only points that I wanted to make. I would be happy to answer any questions, and I am sure that Mr. Kubokawa will be pleased to answer any questions about the concept which he has developed.

I certainly thank you for accommodating me this morning.

Mr. TEAGUE. What is this hangar being used for now?

Mr. GUBSER. It is used by the Navy for various types of shops. There are some aircraft housed in it and if the present baseloading at Moffett Field were to continue, I am quite sure that there would have to be some accommodations and some adjustments made. The last figure I had was that the baseloading at Moffett Field was approximately 50 percent.

It is my personal belief, as a member of the Armed Services Committee, that the mission of the Navy can be met, and the mission of NASA can be met, and with a minor amount of adjustment be compatible with this proposed aerospace museum.

In my opinion, the airstrip at Moffett Field Naval Air Station must remain. First of all, it is an excellent strip. Ninety percent of the take-offs are out over water, although admittedly the approaches are over an inhabited area. It is essential to the test program of NASA. It is very important to the Navy, but I think it is safe to say that all the space in the buildings and the grounds is not being utilized to its fullest capacity today and if this proposal were decided upon, it would not hamper the Defense Department.

But, again, I don't want to localize this too much. It may be that some other place would be far better suited than this. We only envision it here and that is why we talk about it that way.

Mr. FULTON. I wish to welcome the gentleman from California.

Off the record.

(Discussion off the record.)

Mr. FULTON. Should we at this particular time be talking about a permanent installation or should we be talking about starting someplace and get on with the purpose? You see, maybe if we utilize whatever we have, whatever there is at installations and then as we begin to get the collection together, we may find that we must locate it at a place where the people and the collection come in some sort of conjunction.

Mr. GUBSER. Admittedly most of the testimony I have presented is premature. This bill calls for a study, and I think that study would undoubtedly address itself to the very point you have made. I have been addressing myself to a dream. The study may prove it to be completely wrong and infeasible.

May I add this point, and I want it known that Mr. Kubokawa did not dream this up and get these plans ready on company time. This has been an extracurricular activity for him and he and I have worked together as citizen and Congressman and he is not appearing representing NASA.

Mr. TEAGUE. Thank you, Mr. Gubser.

And Mr. Kubokawa, it is good to see you above water. [Laughter.] The prepared statement of Congressman Gubser is as follows:

PREPARED STATEMENT OF CONGRESSMAN CHARLES S. GUBSER

Mr. Chairman, I am pleased to appear to testify on behalf of the proposal I have introduced for myself, Congressman Don Edwards, Congressman Paul N. McCloskey, Congressman Jerry L. Pettis and Congressman Alphonzo Bell. The measure calls for a study of an aerospace museum to be constructed in the western United States.

The original idea was conceived by Mr. Charles Kubokawa of the NASA Ames Laboratory research staff who developed detailed plans, tailored to the landmark dirigible hangar at Moffett Field Naval Air Station, for a self-supporting museum where aerospace artifacts would be displayed.

Spectators would ride a full-sized gantry elevator to a catwalk on the hangar roof. From there, visitors would spiral downward past numerous displays at various levels of the structure.

A moonscape, full-size rockets and aircraft would be featured on the ground level. The movable hangar doors would enclose a large theater for motion pictures and aerospace and other technical meetings. The plan also includes a large aerospace library.

Although I believe the Moffett Field location would be ideal, I do not wish to restrict the feasibility study to this particular site. The general idea, however, should definitely be pursued.

There is no major aerospace museum outside of Washington, D.C., and since the western U.S. has contributed so much to aerospace technology, westerners should have an opportunity to see aerospace artifacts and have access to technical information in the aerospace field.

As you know, the National Aeronautics and Space Administration, in its March 2 report to the Committee on H.R. 10771, concurred in the view that there is "merit in having (such) a museum in the western part of the nation."

This will be much more than just a museum. It will be an aerospace library and a locale for major scientific meetings and symposiums. It could well become a true scientific mecca. If it were located at Moffett Field, it would be near three major universities, in the heart of an aerospace and electronic center, and adjacent to Ames Laboratory. It would be in an area where scientific meetings could be held in an intellectual climate which is close to perfection.

Mr. Kubokawa has expended considerable effort in developing this proposal, and has had expressions of interest from a broad range of sources. In researching the many possibilities of the Aerospace Museum, he collected data upon which he based the following conclusions, which I believe are of interest:

1. The museum will be able to pay back to the U.S. Government, in full, the total amount furnished for the museum (38 million) in eight years time from the official opening day (possibly sooner).

2. The Aerospace Museum could support many other educational projects and create scholarships for future science-research oriented students.

3. The museum will be an ideal facility for the conservation of important-significant artifacts which are of historical importance (presently being dismantled, salvaged or destroyed wastefully).

4. The museum as an educational tool is needed greatly by the present generation, and will be needed even more by the next, to satisfy their natural instinct and their basic needs to identify and be conscious of the happenings that they have inherited technologically.

Some changes have been suggested with respect to H.R. 10771 as it is presently written. NASA has indicated that it considers the Smithsonian Institution, which has primary responsibility for the preservation of historical artifacts, to be the most appropriate agency to conduct the feasibility study contemplated in the bill.

In addition, it has been recommended that the museum be conceived of as a regional facility of the National Air and Space Museum which has already been established under the Smithsonian Institution.

I have no objection to either of these proposed changes.

Mr. TEAGUE. Dr. George Low. It is good to have you with us, George.

STATEMENT OF DR. GEORGE M. LOW, DEPUTY ADMINISTRATOR, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Dr. Low. Mr. Chairman and members of the subcommittee:

I am pleased to appear before you this morning to present NASA's views on H.R. 10771.

This bill, which was introduced by Congressmen Gubser, Edwards of California, Bell, McCloskey, and Pettis, would direct the Administrator of NASA to make a study of the advisability of establishing, in the western United States, a permanent National Aeronautics and Space Administration aerospace museum and to report the results of the study to the Congress within 2 years from the enactment of H.R. 10771.

The report would contain specific findings regarding the recommended location, size, and design of the proposed museum, and the estimated cost and economic feasibility of establishing such a museum.

It is our view that a study for a western aerospace museum should be the responsibility of the Smithsonian Institution, and not of NASA. NASA, of course, would be pleased to support the Smithsonian in such a study.

In 1966, the Congress authorized the construction of the National Air and Space Museum of the Smithsonian Institution, to be located in Washington. The Administrator of NASA serves as a member of

the board of this museum. We understand that an appropriation of funds for the construction of the museum will be sought in the near future.

In 1967, NASA and the Smithsonian Institution entered into an agreement concerning the custody and management of NASA historical artifacts. Under this agreement, NASA transfers aeronautical and space artifacts to the National Air and Space Museum when they are no longer needed for technical purposes. The museum, in turn, is responsible for the preservation of these items, for their display in the museum, and for their loan to other museums and organizations.

I would like to submit for the record a copy of the agreement between the National Aeronautics and Space Administration and the Smithsonian Institution concerning the custody and management of NASA historical artifacts.

(The agreement above referred to is as follows :)

AGREEMENT BETWEEN THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AND THE SMITHSONIAN INSTITUTION CONCERNING THE CUSTODY AND MANAGE-
MENT OF NASA HISTORICAL ARTIFACTS

Whereas the National Aeronautics and Space Administration has in its possession a growing number of artifacts, many with great historical value and others with great value for educational, exhibition, and other purposes, relating to the development, demonstration, and application of aeronautical and astronautical science and technology of flight, and will continue to acquire such materials; and

Whereas such artifacts are unique specimens relating to the science and technology of aeronautics and astronautics, and of flight in the atmosphere and space, which may consist of aeronautical and astronautical objects including, but not limited to, aircraft, space launch vehicles, spacecraft (both manned and unmanned), subsystems of the above, such as rocket engines, pressure suits and personal equipment, instruments, significant recorded data, operating handbooks, drawings, photographs, motion picture film and related documents, sound tapes, training devices, simulators, and memorabilia ; and

Whereas the Smithsonian Institution is charged with the responsibility of memorializing the national development of aviation and space flight; to collect, preserve, and display aeronautical and space flight equipment of historical and educational interest and significance; to serve as a repository for scientific equipment and data pertaining to the development of aviation and space flight; and to provide educational material for the historical study of aviation and space flight.

Therefore, under authority set forth in Section 203 (b) (6) of the National Aeronautics and Space Act of 1958, as amended (72 Stat. 430; 42 U.S.C. 2473 (b) (6) ; Section 4 of the Act of August 30, 1961 (75 Stat. 415; 20 U.S.C. 80c) ; and Sections (4) and (8) of the National Air Museum Amendments Act of 1966 (80 Stat. 310, 311; 20 U.S.C. 77a, 77d), the National Aeronautics and Space Administration (hereafter called "NASA") and the Smithsonian Institution (hereafter called "Smithsonian") enter into this Agreement concerning the custody and management of those artifacts having such historical and educational or other value which have emerged and which will emerge from the aeronautical and space programs administered by NASA.

1. NASA will transfer to, and the Smithsonian will accept as rapidly as reasonably possible, such artifacts currently under NASA control and which will become available in the future, after technical utility to NASA or other governmental agencies has been exhausted and post flight examination has been effected. NASA undertakes no obligation to provide continuing financial support to the Smithsonian, but will provide an agreed initial sum to enable the Smithsonian to begin its work under this Agreement at an early date.

2. The National Air and Space Museum, administered by the Smithsonian, will accept responsibility for the custody, protection, preservation, and display of such artifacts both in the Museum and upon loan to NASA Headquarters, NASA Field

Centers, other Federal agencies, museums, and other appropriate organizations.

3. In connection with the NASA artifacts transferred to the Smithsonian, it is understood that in no instance shall a NASA artifact be finally disposed of to an agency other than the United States Government, or destroyed, before an opportunity is extended to NASA to reacquire, not on a basis of purchase but of reasonable defrayment of the costs involved, custody and control of the artifacts.

4. The Smithsonian will establish a Committee on NASA Artifacts to make curatorial decisions on aeronautical and space artifacts with regard to their significance, preservation, and ultimate disposition. Membership of this Committee shall include the Administrator of NASA if he desires to serve, and such designee as he may appoint, representing historical, technical and public affairs views and others qualifying as experts.

Continuing liaison shall be maintained between the Administrator of NASA or his designee and the Director, National Air and Space Museum or his designee.

Date: March 10, 1967.

S. PAUL JOHNSTON,
For National Air and Space Museum.

Date: March 14, 1967.

S. DILLON RIPLEY,
For Smithsonian Institution.

Date: March 3, 1967.

JAMES E. WEBB,
For National Aeronautics and Space Administration.

Dr. Low. NASA has transferred to the Smithsonian, Mercury, Gemini, and Apollo spacecraft, space suits, rockets, simulators, and hundreds of related items. The Air and Space Museum has not only displayed these items here in Washington, but has also provided them on loan to NASA centers and other locations. Flown manned spacecraft are also touring museums in Europe and the Far East, under the auspices of the Smithsonian Institution.

In NASA's view, this arrangement with the Smithsonian is working well. It appropriately utilizes the extensive capability of the museum in cataloging, preserving, and exhibiting historical aerospace artifacts; and it makes these artifacts available for display to the widest possible audience.

We believe that the construction of the National Air and Space Museum in Washington should proceed as expeditiously as possible when funding can be made available.

We also believe that there would be merit in having a National Aerospace Museum in the western part of the Nation, to make artifacts related to aeronautics and space more accessible to the people in the Western States. This would be especially appropriate in view of the outstanding contributions that many Western States, notably California, have made to aerospace research and development.

However, as I mentioned earlier, we believe that a feasibility study of such a museum would more appropriately be conducted by the Smithsonian Institution, since this Institution has primary responsibility for the preservation and display of historical artifacts. We would, of course, assist the Smithsonian in this study.

NASA therefore recommends that H.R. 10771 be amended to provide that the Secretary of the Smithsonian Institution, in collaboration with the Administrator of NASA, shall investigate the advisability of establishing an aerospace museum in the Western United States.

We also recommend that existing museums, such as the Goddard Rocket and Space Museum in New Mexico, be considered in such a study; and that existing legislation providing for the National Air and Space Museum be taken into account in the study so that any new

legislation establishing a second national air and space museum will provide for the common administration of both museums by the Smithsonian. This will assure the consistent handling and display of artifacts related to the aeronautics and space programs.

Mr. Chairman, this concludes my prepared statement.

Mr. FULTON. How long would such a study take, and how much would it cost and who should pay for it?

Dr. Low. We have discussed this with the Smithsonian and Mr. Taylor, who can respond more fully. I understand a study like this would take slightly more than a year and would cost between \$50,000 and \$75,000.

Mr. FULTON. Would the study include an evaluation of existing facilities as well as any proposals for a new building?

Dr. Low. In our view the study should look at existing facilities, but if the Smithsonian were to do the study, they would have to decide this.

Mr. FULTON. Have they looked to separate space for an aeronautics type of museum, so you would have two separate functions, one space and one aeronautics?

Dr. Low. We have not discussed this with the Smithsonian.

Mr. FULTON. Regarding the moon rocks that are at present under the control of NASA, who is the final deciding authority as to where those moon rocks, first, are located and, second exhibited?

I find that it is harder to locate the authority for the moon rocks than it is to locate the moon rocks themselves.

Dr. Low. Most of the moon samples, of course, are used for technical purposes, scientific purposes, and are assigned to principal investigators around the world on loan. There were, I believe, 154 such principal investigators at the end of 1969.

Mr. FULTON. Then how do they show up at private companies' gatherings when the private companies are incorporated for profit?

Dr. Low. I am not aware of any moon samples showing up at such a place and I would like to hear about it if you have a specific instance.

Mr. FULTON. There was one displayed at a company and they stated they were sorry about the scientists having it. What kind of control is that?

Dr. Low. Most of the samples are assigned to principal investigators. The principal investigators are allowed to seek permission from NASA to display these samples publicly under proper controls. Generally we have granted this permission—

Mr. FULTON. Who in NASA? We are talking about NASA generally. Give me the person or his title. This is what I hear all the time.

Dr. Low. I would have to verify it for the record, but I believe it is Mr. Shapley, who is the Associate Deputy Administrator.

(Information requested for the record follows:)

Public display of lunar samples is the responsibility of Mr. Julian Scheer, NASA's Assistant Administrator for Public Affairs, whose office is under the supervision of Mr. Willis Shapley, the Associate Deputy Administrator.

Mr. FULTON. In your position, you should know who has this authority, what the authority is, and how it shall be exercised as far as the exhibition of moon rocks is concerned because in several places, not just Allegheny County, Pittsburgh, where I live, but there are fairs that are scheduled this fall that have hundreds of thousands of people

coming to them and there seems to be a complete inability to get a moon rock display for even 1 hour, and yet these county fairs, both for urban and agricultural areas, are part of the main events of community life in a particular year. Now, why is that?

I believe, and I just add this, that unless NASA moves to get a broad base of public support, there is going to be a further lack of public support and enthusiasm for the aeronautics and space programs.

Dr. Low. Mr. Fulton, if I may complete my answer. As I said before, most of the lunar samples are assigned to principal investigators for scientific and technical investigations. That is why they were collected.

We have made available a very small number of samples—it is of the order of eight or 10, I will have to check that number—to be made available for public display upon request and within the limits of availability.

(Information requested for the record follows:)

Seventeen lunar samples have been designated for full time public displays. They are assigned as follows:

United States Information Agency for Foreign Displays.....	6
Expo-'70 in Osaka, Japan.....	1
Smithsonian Institution.....	1
For scientific and technical meetings and public display.....	2
United Nations, New York.....	1
Apollo 11 spacecraft tour of State capitals.....	1
Major U.S. museums.....	5
Total	17

Eight more will be available for public display by October 1.

We have a list of how many of these samples exist and where they have been displayed and what request commitments we have for the future, and I will submit this list to the committee.

Mr. FULTON. Did you have a request on the list from the ranking minority member of the Science and Astronautics Committee, or does it hurt to be a member of this committee?

Dr. Low. I will have to check, Mr. Fulton, whether we had a request from you on that list. It certainly doesn't hurt to be on that committee. I will look into it.

Mr. FULTON. Did you ever find the purple thing they kept talking about having seen on the moon surface?

Dr. Low. No.

Mr. FULTON. Who will make the decision as to where these seven, eight, or 10 moon rocks are to be displayed in the closing months of this year?

Dr. Low. The final decision is made by Mr. Shapley.

Mr. FULTON. Is it made for scientific purposes or public relations?

Dr. Low. On these small number of samples, it is made for public relations purposes. The large number of samples is distributed by the technical and scientific organization in Houston with the approval of the Office of Space Science and Applications in Washington. These are assigned to important scientists around the world for scientific investigation.

These investigators are also allowed to display those generally in the location of their own institution with the approval of NASA, and we have granted such approval if it was requested for educational purposes.

There are one or two instances where we have found after the fact that a principal investigator had displayed a sample without our specific permission, and in that case we have taken appropriate actions with his management.

Mr. FULTON. That is what I have been commenting on previously, that there had been occasions where to me the exhibit of these moon rocks was not in conformity with the purposes of NASA's information purposes or educational purposes or purposes of the Government's general policy.

Dr. Low. When we have become aware of that, we have taken action with the appropriate authorities at that institution.

Mr. FULTON. One final point. Of course it has been stated, and rightly, that it will take a period of years, really, to do the scientific and technical investigation of the moon materials we already have that are in reserve. Is that not correct?

Dr. Low. Yes, sir.

Mr. FULTON. It will take some time, it is not going to be instantaneous research?

Dr. Low. Yes, sir. It will take many years.

Mr. FULTON. Then NASA is in a good position, somewhat similar to a bank that does not use all its reserves, but has them for future purposes. How much of the moon materials do you have, moon rocks, moon dust, and moon cores in reserve which is not being used during this calendar year?

Dr. Low. I would have to supply that for the record.

(Information requested for the record follows:)

The distribution and allocation of returned lunar samples is as follows:

[In grams]		
	Apollo 11	Apollo 12
Returned lunar material	21,694	34,369
Distribution to scientists	7,117	11,943
Public Affairs Office displays:		
Returnable	1,128	1,529
Nonreturnable	110	0
Reserve for future scientific and technical studies	13,439	20,897

¹ 200 nonreturnable displays for State Governors, and foreign heads of state.

Many of the samples listed above as being held in reserve are undergoing preliminary analysis and classification in the Lunar Receiving Laboratory as a guide for planning future research, and also to see what samples have to be kept for study and which might be suitable for display.

There are a number of additional reasons that we initially limit the amount of material placed on display. Because of the nature of these samples, we have to assume at the beginning that each rock may be unique, and treat it accordingly. For example, rock 12013 appears to be the oldest rock ever found on the earth or moon, and so is a national treasure of incalculable scientific value—a kind of Rosetta Stone for the Solar System. There isn't enough of rock 12013 right now to fill all the requests for samples we have already received.

We are now using methods of analysis on these Moon rocks that were not even dreamed of 25 years ago. As science advances, we can expect that important newer and more sensitive methods of study will be developed in years to come. For example, meteorites are also rare samples of extra-terrestrial matter. Today, scientists would like to be able to ask some important questions of certain meteorites that fell a number of years ago, but cannot, because these specimens are used up or spoiled in previous analyses. Even today, lunar samples would be ruined for

certain tests if a scientist were to breathe on them or touch them with his fingers. We think that it may be extremely important for future science in this country that we keep the right number of these precious lunar samples in as safe and undisturbed conditions as possible.

Mr. FULTON. My point is that you have got so much that can be used under proper guardianship and control, that not to use it and simply have it stored in vaults is really hurting NASA and hurting the programs in my estimation.

When you have 200 million people and eight moon rocks to display to these 200 million people out of the stock you have, to me, as a politician, if I exhibited myself in that same percentage of time, I would not be here as long as I have been, and I don't think the gentlemen from Texas or Minnesota would be here either, because we wouldn't have the public support and justifiably so.

Mr. KARTH. And he probably wouldn't be deserving of being here.

There is something to be said about the public will, after all, and the public's desires and, frankly, it seems to me that we are getting awfully bureaucratic at a very young age in NASA.

I want to inform the gentleman from Pennsylvania, and I don't know what significance this line of questioning has in relation to the proposition before us, but I think it is as good a time as any to explore it.

Minnesota has the largest State fair in the Nation, well over 1 million people attend each year. We are not sure whether we can get a moon rock big, small, or otherwise, to exhibit for a million people in the upper Midwest, who have in part, like the people from Texas and other regions in the country, paid to bring it back. I think it is about time that somebody stops to think and to exhibit to the public, who in the final analysis paid the total bill for these moon rocks. Not only the scientific community, but the general public as well should have an opportunity to see it.

I appreciate the fact that these moon rocks are assigned primarily, if not exclusively, for technical and scientific investigative purposes, but that doesn't mean it is right and it doesn't mean that that policy ought to be continued.

I merely suggest too, along with the gentleman from Pennsylvania—and oftentimes we find ourselves polarized in different directions—but I want to join him today and suggest—

Mr. FULTON. You can't always be right.

Mr. KARTH. I want to suggest strongly to the NASA officials that someplace along the line, while a part of the Apollo program has been dedicated to the scientific end of the spectrum, that you give some consideration of sharing that scientific evidence of our having been the first on the moon and probably the only Nation on the moon for many, many years to come, by exhibiting these moon rocks around the country, not only at State fairs and other large public gatherings, but even at the local level, like county fairs, as suggested by the gentleman from Pennsylvania.

It would do wonders for NASA in terms of public relations. It would make our job much easier on the committee. It is worth 10 times 10 the millions of dollars NASA spends on public relations today.

I get reams and reams and reams of junk in my office, most of which I don't have time to read, prepared at great expense to the taxpayer, I

am sure, and frankly I don't know who has time to read it because sometimes it is just volumes of stuff. In many of the instances, I am quite sure, even though I haven't read it, that it is very repetitious of other material that has already been put out by the so-called public relations department.

I think it is very important, Dr. Low, that this evidence of our being there and this evidence of the expenditure of many billions of dollars be exhibited properly so that the taxpayers of this country can take a look at it, not only through the eyes of the scientist, but through their own eyes. I think it is extremely important.

Dr. Low. I think this discussion is very appropriate because 1 year, 1 hour, and 7 minutes ago Neil Armstrong, Buzz Collins, and Mike Aldrin were launched toward the moon, so today is a very important anniversary for us.

Mr. FULTON. The gentleman from Minnesota is right. In western Pennsylvania we are going to have for 5 million people out of 12, our county fair. We will get over a million people coming to our fair.

My point is that, not only can I not get a final yes or a no answer, but that I can't find out who in NASA has the final authority to say yes or no as to whether this particular large fair shall have any moon samples of any type or variety to exhibit. Second, there can be adequate protection provided by the local people and actually they may pay the costs, whatever they might be, for getting the moon sample from where it is and returning it in good condition.

This is a place where NASA gets public relations for free, and the local people are willing to pay for it. I can't say strongly enough that I feel that the reserve samples, that are not out for investigation, and that are for future years' use, can certainly be put to some use instead of being kept lying in some inert nitrogen vault.

Mr. KARTH. If the gentleman would yield, I think that after the taxpayers have spent some \$20 million or more to get the evidence, it just seems to me that on behalf of the taxpayers a few more dollars could be spent to exhibit it so that they could see it. I don't know that I share the gentleman's thought that maybe these local communities ought to pay whatever costs are associated with it, although I am sure that whether they pay the transportation costs or whatever they might happen to be, that as far as security is involved, that the local communities would provide that security by making available local police and other law-enforcement officers, State police, and what have you.

But that notwithstanding, I think the budget would not suffer a scintilla of an increase in terms of cost if we diminished proportionately the other public relations features of NASA's Office of Public Relations and transposed that money into the area of exhibiting these moon rocks around the country so that the public can see them.

Mr. FULTON. With the chairman's permission, I would like to make a request of NASA and the Smithsonian now to give us an estimate in writing. I would like a current estimate of the number of people who are now viewing the moon rock in the Smithsonian Institution and, second, where is the flag?

I thought up the idea of supplying the flag and actually bought a flag that flew on the capitol for them to have on the moon, and it was one of the two flags that was brought back.

Those flags should be sent around the country and shown, because it combines patriotism with our great accomplishment of landing on the moon, and having the flag stored someplace in the Smithsonian or off in some corner where there is not great viewing is not consistent with the purpose for which I really bought the flag.

(Information requested for the record follows:)

As of July 15, 1,861,665 persons have viewed the sample on display at the Smithsonian. On the average, 6,209 persons view the sample a day.

The United States flags carried on the Apollo 11 mission were presented by the Apollo 11 astronauts to the President of the Senate and the Speaker of the House of Representatives at the Joint Meeting on September 16, 1969. The flag that Mr. Fulton refers to was the one presented to the Speaker of the House.

Mr. TEAGUE. Back in 1967, NASA and the Smithsonian signed an agreement to turn over space-oriented artifacts. To what degree has that agreement been implemented?

Dr. Low. On a daily basis. We have turned over major hardware items, all of the manned Mercury spacecraft and some of the unmanned spacecraft.

We have turned over all of the manned Gemini spacecraft, and we have turned over Apollo spacecrafts 7 and 8, which were the first ones to fly around the moon.

The Apollo 11 spacecraft is touring the 50 State capitals this year and will be turned over after completion of that tour.

In addition to that, hundreds of small items have been turned over.

Mr. TEAGUE. In your opinion, if we did something like this bill proposes, would there be sufficient material to go to another museum on the west coast?

Dr. Low. In my opinion, yes; but I would rather have the Smithsonian answer that question.

Mr. TEAGUE. Are there any further questions for Dr. Low?

Mr. FULTON. As you know, I have been interested in the space program and very interested from the beginning in the fact that Commander Shepard who risked his life in going up in a rocket at the level of technical efficiency at the time, which I felt was very low and very risky. I felt so strongly that he would probably be forgotten in the future, that I had his portrait painted and donated it to the Smithsonian Institution. In fact, I felt so strongly about it that I didn't even take a tax deduction on it, which is something.

Now, if anybody has been seeing that portrait, and it is a good one, nobody has ever reported back to me that they have even seen it or noticed it.

I don't think we should forget these early astronauts. My recommendation is that the Smithsonian see that these things such as the U.S. flag that was on the moon and the portraits of these astronauts and the pictures that have been taken, be circulated around the country so that we have in effect the same kind of a circulation that we have on other museum installations.

I happen to be interested in several of them, and we are able to get pictures on loan. I think that NASA and the Smithsonian again should do that.

Mr. TEAGUE. Dr. Low, in view of this discussion on lunar sample exhibits, would you provide for the record, an extension of your remarks on the policies concerning public exhibits and the extent to which these policies have been implemented?

Dr. Low. Yes sir.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION,
Washington, D.C., July 24, 1970.

HON. OLIN E. TEAGUE,
*Chairman, Special Ad Hoc Subcommittee, Committee on Science and Astronautics,
 House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: The recent hearing on H.R. 10771 of the Ad Hoc Subcommittee of the Committee on Science and Astronautics touched briefly on some aspects of the subject of public exhibits of lunar samples. I would like to take this opportunity to supplement my answers and attempt to give the Subcommittee a more complete picture of what NASA has done and is doing to assure that as many Americans as possible have an opportunity to view the materials brought back from the moon by our astronauts and, hopefully, gain some appreciation of their significance.

The attached table indicates the samples that have been available for public display and how many people have seen them in the first year since the first lunar landing. Even with a reasonable allowance for overlap in our attendance figures for individuals who may have seen exhibits more than once, these figures indicate that over six and a half million people in the United States have seen a lunar sample. As a matter of policy—which we have adhered to with only a few unavoidable exceptions—every public display has been accompanied by an exhibit and supporting material which has sought to convey the significance of the sample and the values of lunar exploration so that the viewers do not regard the lunar material merely as a novelty but come away from the exhibit with some appreciation of its broader meaning. In this regard, we believe that the exhibits at 15 major science museums to date, with 41 more planned for the coming year, in addition to the exhibit accompanying the Apollo 11 capsule to all 50 state capitals and the Smithsonian exhibit, are especially effective.

The area that has been most difficult for us has been the tremendous number of individual requests we have received for displays of lunar samples at particular occasions. During the past year we have received over 1,300 such requests from individuals and organizations all over the country and have been able to fill 74 of them to date. Obviously we cannot meet all of them. Many requests do not qualify under the basic criteria which we have to set as a responsible agency of the government. For example, we have had to reject requests associated with advertising, commercial, or fund-raising activities. We have also had to turn down requests where the sponsors were unable to provide adequate arrangements for the transfer, security, display, and return of samples. In some cases, of course, the scheduling of available samples and exhibits has made it impossible to have a sample available for a particular place on a particular date. Within these necessary constraints we have done our best to give favorable consideration to all requests received.

The question of occasions such as state and county fairs is especially difficult. In spite of good intentions, unacceptable commercial overtones are hard to avoid and the stringent security that must be provided to protect the samples is hard to maintain. Perhaps most importantly, it is our view that the samples should be presented so that the viewer receives full information on the scientific and engineering enterprise that is involved in lunar exploration, and does not regard the samples simply as curiosities. For these reasons, I believe we must consider each proposal of this nature on a case-by-case basis.

Several weeks ago, based on an assessment of our experience to date and the prospective availability for display of Apollo 12 samples, we decided to augment by six the number of samples and associated exhibits available. More recently we have decided on a further increase of two. Thus, as indicated in the attached table, the total number of samples with exhibits available for programmed and individual requests for displays will increase from 10 to 18 by about October 1.

I want to assure you and the Subcommittee that NASA fully appreciates the importance of making lunar samples available for display at every appropriate opportunity and that we will continue to make every effort to respond favorably to Congressional and other special requests.

Sincerely yours,

GEORGE M. LOW,
Deputy Administrator.

cc: Hon. George P. Miller, Hon. James G. Fulton, Hon. Joseph E. Karth.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION—PUBLIC DISPLAY OF LUNAR SAMPLES¹

Category	Number of samples	Number of viewers to July 1970
1. Programed exhibits:		
Major U.S. museums.....	5	2,660,000
Smithsonian Institution.....	1	1,905,000
Apollo 11 spacecraft tour to 50 State capitals.....	1	800,000
United Nations, N.Y.....	1	(²)
2. Presented by President to Governors.....	50	(²)
3. Other:		
Samples and exhibits available for meeting approved individual requests for scientific meetings and public displays.....	42+8	1,440,000
Samples assigned to scientists at institutions throughout the United States which may from time to time be available for local public display.....	³ 154

¹ Excludes USIA exhibits overseas and samples presented by President to foreign heads of state.

² Presented July 20, 1970.

³ Unknown.

⁴ Eight additional samples and exhibits will become available about Oct. 1, 1970.

⁵ Number of principal investigators.

Mr. TEAGUE. We will next hear from Mr. Frank A. Taylor, Director-General of Museums at the Smithsonian Institution, and Acting Director, National Air and Space Museum.

Mr. Taylor.

STATEMENT OF FRANK A. TAYLOR, DIRECTOR-GENERAL OF MUSEUMS AT THE SMITHSONIAN INSTITUTION, AND ACTING DIRECTOR, NATIONAL AIR AND SPACE MUSEUM

Mr. TAYLOR. Thank you, Mr. Chairman.

I am Frank Taylor, Director-General of Museums at the Smithsonian Institution and Acting Director of the National Air and Space Museum.

I am pleased to have this opportunity to testify to the views of the Smithsonian Institution on H.R. 10771, a bill:

To provide that the Administrator of the National Aeronautics and Space Administration shall investigate and report to the Congress as to the advisability of establishing a permanent National Aeronautics and Space Administration Aerospace Museum.

For more than 70 years the Smithsonian has been associated with air and later space developments. Secretary Langley, the third Secretary of the Smithsonian and a leading astrophysicist of his day, conducted studies of aerodynamics and built a number of powered models and a full-size aircraft.

Secretary Charles Walcott was a leader in the establishment of the NACA, a predecessor of NASA, and also at the urging of his assistant secretary, Dr. Abbot, gave modest but early and essential support to the researches of Robert Goddard.

When Dr. Abbot became Secretary he continued the aid to Dr. Goddard and published the first scientific accounts of Dr. Goddard's work. Dr. Abbot is also an astrophysicist.

The Smithsonian Astrophysical Observatory in recent times conducted the photographic tracking of satellites and continues to contribute much original and basic knowledge of astronomy and astrophysics to our space programs.

More than 50 years ago the Smithsonian began to select and collect significant aircraft and accessories to interpret and commemorate the great advances in flight. Today it has one of the two greatest collections of aircraft materials and, of course, the finest collection of spacecraft.

The Congress has already directed that the national development of flight shall be memorialized; that air and space objects of historical and scientific significance shall be preserved and displayed; and that educational material for the study of air and space history and development shall be provided. (20 U.S.C. 77a.)

This began congressional encouragement and legislative action in the interest of air and space science and history which has continued for 24 years.

In the act of August 12, 1946 (Public Law 79-722; 60 Stat. 997; 20 U.S.C. 77) establishing the National Air Museum as a part of the Smithsonian Institution, the Congress included provisions for selecting a site for a National Air Museum building to be located in the Nation's Capital.

By the act of September 6, 1958, the Congress designated a site for a building to be on the Mall from Fourth Street to Seventh Street, Independence Avenue to Jefferson Drive.

Planning appropriations in the amount of \$511,000 and \$1,364,000 were made available to the Smithsonian by the Congress for the fiscal years 1964 and 1965, respectively, and have been expended.

In 1966 the Congress enacted Public Law 89-509 (80 Stat. 310) authorizing the actual construction of the National Air and Space Museum. The Board, with whose advice the Museum is administered, was expanded to include the Administrator of the National Aeronautics and Space Administration, the Chief of Staff of the Air Force, the Chief of Naval Operations, the Chief of Staff of the Army, the Commandant of the Marine Corps, the Commandant of the Coast Guard, the Administrator of the Federal Aviation Agency, the Secretary of the Smithsonian Institution, and three citizens appointed by the President. (20 U.S.C. 77(a).)

Construction of the proposed building awaits only an appropriation, which will be sought in the near future, as soon as military expenditures in Vietnam have been substantially reduced. The building will consummate the successive congressional authorizations for the national museum in the Nation's capital.

This museum within the Smithsonian will add a new dimension in research in air and space science, technology, and history. For the first time in our Nation's history, these developments and achievements of national importance will become fully accessible in the Nation's capital to the scholar and to the general public.

Functioning as a center of exposition and education, the building will provide capacity both for large numbers of visitors and for a comprehensive array of air and spacecraft, instrumentation, engines, models, and historical reference documents. Exhibitions will be changed periodically and a series of most timely presentations will continually be on display.

The building design will provide excellent flexibility for its functional requirements. The location on the Mall as designated by the Congress is most appropriate, being immediately adjacent to the other

Smithsonian Institution museums where it will be most convenient to the crowds of visitors. The location is adjacent, also, to the headquarters of the National Aeronautics and Space Administration and the Federal Aviation Agency.

The National Aeronautics and Space Administration has since its inception made a practice of turning over to the Smithsonian the most significant specimens of space technology.

This relation was made formal when, in March 1967, the Administrator of NASA and the Secretary of the Smithsonian Institution executed an agreement concerning the custody and management of NASA historical artifacts, pursuant to 20 U.S.C. 77d.

The agreement, after identifying aerospace artifacts that are significant specimens for preservation and exhibit, established a procedure for transfer of title to such artifacts to the National Air and Space Museum when their "technical utility" is exhausted.

The agreement further placed upon the National Air and Space Museum the responsibility to acquire, preserve, and display these aerospace artifacts in the museum and on loan.

Finally, an initial fund was established to start the project.

For more than 2 years, the National Air and Space Museum has been acquiring, preparing for exhibit, and displaying significant aerospace artifacts. Mercury, Gemini, and two Apollo spacecraft have been transferred to the National Air and Space Museum along with astronaut spacesuits, rocket motors, training simulators, and hundreds of related items and associated documentation, such as spacecraft technical manuals. Tens of thousands of photographs have been delivered and organized into a chronological file.

Flown manned spacecraft and spacesuits are on loan from the National Air and Space Museum to NASA and are on display at NASA centers and other appropriate locations in the United States.

Gemini and Apollo spacecraft are currently touring Europe and the Far East either on a museum-to-museum basis or in cooperation with the U.S. Information Agency and the Department of Commerce. Future schedules are firm in Europe and the Far East through 1970. Meanwhile, exhibit plans and philosophy for communicating the story of the history of aerospace, contemporary accomplishment, and trends of future programs are being developed both in-house and under consultant contract.

We would urge that the National Air and Space Museum be supported by granting the current authorization for construction of its splendid building on the Mall before other regional facilities of a similar nature are planned.

Should a regional facility be deemed appropriate and feasible, such a museum would properly best operate in affiliation with the existing National Air and Space Museum. This would allow the western museum, if built, to benefit from valuable administrative support already built up in Washington.

This support includes experience with exhibits, historical and scientific research, and, not least, access through loans to the vast collections already in the possession of the National Air and Space Museum.

But it seems to us clear that work on any regional, affiliated museum should await completion of the National Air and Space Museum Building on the Mall.

In conclusion, I would say that it is the consensus of the Smithsonian Institution Board of Regents that since the National Air and Space Museum has already been established, a second national space museum should not be created by NASA.

It was suggested, however, that if Congress should determine, upon the basis of the proposed study and report, that a space museum should be built for the western region, it should be a branch or affiliate of the National Air and Space Museum. In consultation with the NASA Administrator, the Smithsonian would willingly undertake the proposed study, if the necessary funding can be provided by NASA. I understand that NASA is willing to assist the Smithsonian in any way necessary.

That is the end of my statement, Mr. Chairman.

Mr. TEAGUE. Mr. Taylor, does the Smithsonian Institution have the authority to make this study without legislation?

Mr. TAYLOR. Yes, I believe we could make this study if we were requested to make it. I think the procedure would be that some agency of Government would request us to make it, and we in turn would submit a proposal as to what we would do. I think we have the authority to go ahead and do it.

Mr. TEAGUE. Are there any further questions?

Mr. KARTH. Thank you, Mr. Chairman.

How much do you think a study like this would cost?

Mr. TAYLOR. I have made a rough plan of what I think the study should contain, and pricing it out very roughly, I came to \$75,000 for a study that would last about 14 months.

Mr. FULTON. Could we have that rough plan of the study in general outlines put in the record at this point?

Mr. TEAGUE. You say you have such a rough study. Do you have it in such form that we can put it in the record?

Mr. TAYLOR. If you will understand that I did it off the top of my head in the time that I had, yes, I would be pleased to put it in. It touches on quite a number of points that were mentioned earlier, such as whether existing facilities could be used, investigations of these matters, and others.

Mr. TEAGUE. I think also Mr. Kubokawa made a rough study. We can put both of them in.

(Information for the record is as follows:)

THE SMITHSONIAN INSTITUTION—ESTIMATED BUDGET

Western Aerospace Museum feasibility study

Staff salaries and benefits:	
Coordinator of study (14 months)-----	\$26, 800
Clerk-stenographer (14 months)-----	9, 000
Consultants (5) 5 days each, \$100/day-----	2, 500
Travel:	
Coordinators, 5 at \$475-----	2, 375
Consultants, 5 at \$375-----	1, 875
Communications-----	2, 500
Graphics, drafting-----	2, 450
Contractural services for detail surveys such as economic feasibility-----	20, 000
Equipment rental (projectors, office equipment, etc.)-----	1, 000
Office supplies, film-----	500
Printing-----	1, 000
Smithsonian indirect costs-----	5, 000
Total-----	75, 000

PLAN FOR A STUDY OF THE FEASIBILITY OF A NATIONAL AEROSPACE MUSEUM IN
THE WESTERN PART OF THE UNITED STATES

PART 1

Smithsonian staff provides coordinator with basic information about air and space museums and the scope of their programs of education, exhibition, preservation, public information, historical research, and publication; and the content of the national collections of air and space material.

Smithsonian staff provides information about air and space museums in the United States and abroad and assists in arranging visits to appropriate museums in the United States.

Coordinator assisted by the Smithsonian staff collects information on the siting characteristics of existing air and space museums, including accessibility and parking requirements, attendance, admission charges, ownership or governing organization, scope of public and research programs, staffing, cost of buildings, operating and maintenance budgets.

Coordinator prepares report on existing museums with comparisons of programs and costs based on above.

Coordinator and staff determine nature of cooperation that the proposed museum could expect to obtain from existing museums.

Coordinator advised by Smithsonian staff and consultants compiles descriptions of the most innovative exhibitions and educational programs to involve viewers and students and identifies opportunities for the proposed museum to expand the museum's role in public education and community services. Descriptions include experiments, research, and development of communications techniques.

Coordinator and staff write a program of activities for the proposed museum and estimate the requirements for site, building, and equipment to accommodate the activities.

Coordinator and staff on the basis of the above studies write the criteria for the location and site of the proposed museum relative to patterns of tourism; local population concentrations; availability of buildings or other facilities; anticipated local public and private support; proximity of industry, military and NASA establishments; and community needs.

PART II

Coordinator with advice of Smithsonian staff assembles suggestions for appropriate locations for the proposed museum and determines which should be studied in depth.

Coordinator collects information on several selected sites and with assistance of staff of Smithsonian in consultation with NASA and the Committee makes arrangements to visit locations and consult with community and industry leaders, public officials and development offices about availability of land, buildings, and local support.

Coordinator tabulates advantages and disadvantages of several locations, compares sites, prepares estimates of costs to construct or convert building and parking, equip, install, staff, and operate the proposed museum at each location.

Coordinator obtains professional advice on the economic feasibility of establishing and operating the proposed museum at each of the selected locations.

Coordinator in cooperation with consultants determines order of feasibility of several sites and prepares final report.

A PROPOSAL FOR A NASA AEROSPACE MUSEUM¹

(By C. C. Kubokawa)²

INTRODUCTION

A myriad of products, equipment, and methods to make a simple life simpler, and at the same time complex and confusing, has been thrust, conceived, and delivered into this generation from discoveries, ideas, and inventions by creative individuals. And life is what it is today because we were bequeathed with such inheritance.

¹ Supporting sketches accompanying this study are available in the committee files.

² Research scientist, NASA-Ames Research Center, Moffett Field, Calif.

To be content and rest on all the past historical-scientific accomplishments without furthering our knowledge, regard for future developments, or what this generation can leave for the oncoming generations, can lead to the decline of our scientific and cultural world. In order to curb such possibilities, the writer feels that the National Aeronautics and Space Administration (NASA) can play a monumental role in keeping the wheels of progress rolling on the right track in the science and technology field by ingeniously weaving the past with the present; instructing, informing, and enlightening the present generation about future goals; maintaining, generating, embedding interest, and creating a challenge for the oncoming generations with dramatic demonstrations and information as to why, how, when, where, who, and what of the U.S. aerospace effort. The public, as taxpayers and contributors to much of the developmental programs, is entitled to, deserves to know, and be kept informed of the historical and scientific knowledge and happenings of aviation and space without any reservations!

The purpose of this paper therefore, is to propose for the building of an aerospace museum at the Moffett Field zeppelin hangar (which is already a historical site). The museum will be the West Coast facility for preserving and chronicling historical items, communicating aerospace information, and will be the medium for increasing interest in the past, present, and future of the aerospace research field.

Museum objective

The objective of the museum is fivefold, to be:

(1) A source for furnishing the younger generation with aerospace facts, nurturing their interests in the aerospace facts, nurturing their interests in the aerospace research field with facts as to the problem areas, what the researchers have accomplished, are accomplishing, and are trying to accomplish.

(2) An establishment for informing the public as to how their tax dollars have supported, are supporting, and will support the aerospace research and development, and how they benefit from the end products.

(3) A center for restoring, maintaining, and storing important historical aerospace artifacts and information.

(4) A facility for holding technical meetings and presentations, as well as a way of preserving the historical site and implementing optimum maximum use of the entire zeppelin hangar.

(5) A facility for informing visitors from other lands about the aerospace research that is being conducted in the United States. ("... in a manner which does not threaten other nations, but evokes continuing respect and admiration ... " Dr. T. Paine)

A communication gap always exists with the public on news of scientific accomplishments, and the one shot news media (e.g., newspaper, radio, T.V.) does not have the medium or impact of sustaining and maintaining, in the lime-light, the data on great aerospace discoveries and accomplishments that can be dramatized by a museum. A museum is a living link with the past through artifacts and testimonials of the inventive minds.

Many a taxpayer will not be able to experience a trip on the SST or a moon vehicle, but to be able to touch and experience sitting in a SST mockup, or in a Lunar Vehicle will undoubtedly excite their interest in the future of the aerospace research programs and hopefully make them feel that their support is an important link in the chain of progress. The experimental happenings with dynamic-real models in the aerospace museum will be vividly remembered and probably never forgotten.

Facts

The following factual statements in this section are made in support of the proposal for the aerospace museum:

Geographic Location.—California is the most populous state in the United States, and it is predicted that the population of this state will double by the year 2000 (30 years from now).

The climate of the San Francisco peninsular area is second in the world only to that of the ideal temperate region of the Nile Valley in Egypt, without extreme weather conditions, thereby very conducive to tourist activities.

There is no major aerospace museum outside of Washington, D.C.—Everyone cannot afford the high cost of hotel tourist living in Washington, D.C. where the monopoly of all the better known sightseeing points of interest are located in the United States. In systems engineering, one has learned that effectiveness of

operations sometimes require decentralization and the distribution of authority in properly relegated (subsystems) areas. It certainly would facilitate and improve-optimize dissemination of information on national aerospace achievements only if the potent information could be unleashed and made readily available to the populous of the western United States who cannot afford a trip all the way to the east coast (e.g., blue collar, semi-skilled, and unskilled workers).

The hard working white, blue collar, semi-skilled, and the unskilled worker, who are not heralded individually, are the backbone, energy, and integral part of the machine that keeps our nation functioning. To be a part of the U.S. aerospace organization team, and shown in the museum the end products and achievements for which the individual has had a part no matter how small, will help the individual to identify his contributory role with specific portions of the end product and be reinforced by this recognition.

The museum, once completed, will be more than able to support itself financially and can, in a financial way, support many other government activities.

With longevity and more leisure time becoming available to the populous, places of interest, recreation, creative arts, outdoors, culture centers, museums, etc. will be the most frequented places. Therefore, one must look to the future and plan for the oncoming days rather than making plans after the need or problem arises.

Established facts are used to support the statement that, "once completed, the museum will be able to support itself." The predicted facts are:

(1) The Manned Spacecraft Center in Houston, Texas, although it has no museum, has hosted over 450,000 interested visitors through the Center, with over 20,000 for one day being the record.

(2) Over a million persons have toured through the Kennedy Space Center since 1966 with 600,000 paid tourists in 1967 and 100,000 non-paying in 1967.

(3) Marshall Space Flight Center has had more than 220,000 tourists per year going through that Center.

The above figures are encouraging enough to start an immediate push for the museum to show the public how aerospace technology has greatly effected our country and the world.

To look one step further into the future, there are two other points that can truly add to the justification of the aerospace museum on the west coast:

(1) Future multiple manned shots for interplanetary missions and orbiting space laboratory operations are programmed for Vandenberg Air Force Base in Lompoc, California. The spotlight will be on California rather than on Florida from that time on.

(2) The 1976 World Olympics may be in California, and if the museum were started in 1970, the museum will have been in operation for more than 3 years and all the operational faults would be cleared up by then and the facility would be able to handle at least 75,000 tourists daily.

Operational Qualities of the Museum

The museum will be operated efficiently and maintained properly by using modern day technology. Some of the features envisioned for the museum are things such as:

(1) All-weather moving sidewalk from parking area, with automatic parking space locator and automatic parking lane closers so that cars will not be going up parking rows which are already filled—(time saver).

(2) Parking security—T.V. monitor and video tape scanning system to record activities going on in the parking area to prevent thefts and damage to cars. For recording and identification.

(3) Attendance keeping entry way with audience participation when entering i.e., what state they came from, etc.; a little personal touch with visible response on wall.

(4) Single directional flow of spectators. After the spectator gets off the gantry elevator, he will walk down a continuous ramp to the end of the exhibits. This approach will be incorporated to give the spectator a feeling of assurance that he has seen all the exhibits in the museum. Unlike all other museums, excluding the Museum of Modern Art, one will not get lost or feel as though he has missed a room of exhibits.

(5) The walk-down ramps, exhibits, facilities, etc. will be designed to accommodate people of all ages and physical handicaps (e.g., wheelchairs, crutches, myopia, etc.).

(6) Special identification points for photographic enthusiasts. Areas pinpointed with optimum set location providing information on camera shutter speeds and iris diaphragm openings and where to place the subject.

(7) Audio and visual aids supplied to foreign visitors in their language as an aid to helping them understand the exhibits and presentations (wherever possible), e.g., Spanish, Japanese, Chinese, French, Italian, German, Russian.

(8) Time system to keep everyone aware of the time (in alpha numeric system). Clocks will be at both ends, and a globe clock in the center of museum. People will be notified upon entry into the museum the average time it takes for one to go through the exhibits. Special exhibits taking up specified amount of time will be so noted at its entrance.

(9) Special smoking lounges for smokers because smoking will not be permitted in the display areas (for safety purposes).

(10) Up-to-date status board of all items in space, with information on the life and disposition of the space vehicles.

(11) Latest state of the art safety features, fire suppression and display protection.

(12) Message and courtesy telephone system. If a spectator visiting the museum is expecting an important phone call, the message center at the entrance will issue the spectator an automatic page buzzer which will notify him that a call has been received for him at the switchboard. All the spectator has to do in that case is go to the closest courtesy telephone and take the call (two phones will be located on each floor level).

(13) Computer operated snackbar operations. Ordering of snacks by the selection of preprogrammed computer cards and inserting them into the ordering card readout, etc.

(14) Modern rest rooms, lounges and waiting areas, with local area activity news, places to eat, stay, etc. (eg., Palto Alto, Mountain View, Sunnyvale, Menlo Park, Atherton, etc.)

(15) Computer operated book and souvenir shop where the spectators could buy special publications and aerospace oriented quality gifts and mementos.

(16) Historical computerized aerospace information center. Library with information on all documents put out on U.S. and maybe foreign aerospace happenings. As a source for people doing research on aerospace.

(17) Main communication and control console to maintain proper flow of people in the museum, monitor via TV areas creating tie-ups, maintain proper control of temperature and humidity, regulate schedule time for showings, public announcements, control entrance to shows, background music, etc.

(18) An automatic display trouble indicator system. An electrical display system showing the location of the malfunction in an exhibit, rest rooms, etc., identifying floor level, area and exhibit, etc. (Alerting system for immediate exhibit repair.)

(19) Special maintenance elevator for transporting new exhibits, etc. to different floor levels—strictly for service use.

(20) Built-in cleaning equipment. Vacuum equipment, built into walls for cleaning displays and display areas. The caretakers will not have to push trash boxes or brooms, thereby preventing bangup of displays minimizing dust in the exhibit areas, etc.

The above 20 items are just some of the special qualities of the aerospace museum. Other special features (e.g., technical meeting areas, theater, projection rooms, cafeteria, restaurant, observatory, etc.) will be discussed in detail when responsible supporters of the museum feel that the museum will have financial support and be a worthwhile project.

Museum exhibits

Most of the museum exhibits will be mockup, operational models, prototypes, wind tunnel models, gifts, specimens from other planets, special dynamic spectator participation exhibits, lunar surface set, gentry with remodeled spectator elevator, etc.

In a majority of the cases, the mockups and equipment to be exhibited are government property, paid for in full. Presently, in many cases, if there is no storage space or further use for the equipment, it is their scrapped (destroyed) or dismantled and stored for years without any functional use. Yearly, millions of dollars are spent on functional mockups (eg., SST, LEM, MEM, etc.) and destroyed without letting the general public have the opportunity of seeing or coming in contact with the models for which they paid for through their tax dollars.

Scaled wind tunnel models and dynamic operation mockups could be kept in top condition in the museum in such a manner as to enable immediate use of the models or mockup when necessary for retesting or research. It would make it worthwhile and economical from the research standpoint and, at the same time, let the museum perform a triple function; (1) exhibit, (2) store, and (3) upkeep, update, and maintain.

Museum personnel

To operate the museum autonomously, coordinate meetings, tours, maintain exhibits, contract concessions, facility upkeep, maintain safety-security, generate new displays, etc., it will take 58 persons.

Museum cost

It is estimated that inclusive of new roadways to and from the Bayshore Freeway (U.S. Route 101), building interior remodeling, items discussed under the section on the operational qualities of the museum, electrical systems, computer operations, etc. will cost approximately 28 million. The breakdown of the costs is as follows:

[In millions of dollars]

(1) Three-level floor modifications.....	5.0
(2) Entry, causeway, blockhouse, gantry.....	2.0
(3) Parking area and road to freeway.....	4.0
(4) Heating and air conditioning.....	1.0
(5) Electrical, status, computer, etc.....	3.0
(6) Food facilities.....	2.0
(7) Theater (seats, screen, projectors, acoustics).....	2.0
(8) 5 special elevators.....	1.0
(9) Special graphics.....	2.5
(10) Displays (dynamic, moon surface, etc.).....	2.0
(11) Emergency exits.....	0.5
(12) Auditorium and lecture halls.....	1.0
(13) Benches, tables, offices, shops, chairs, etc.....	0.5
(14) Fabrication-restoration-maintenance shop area—glassblowing, electrical, etc.....	0.5
(15) Landscaping, outside painting, signs, lights, etc.....	1.0
Total	28.0

It would be wise to make the decision for undertaking this big task as soon as possible and not ponder too long because the cost of building material, labor, equipment, etc. is rising in leaps and bounds.

It is furthermore estimated that the cost of the museum would easily be paid back totally in about 8 years at the present rates if admission and concessions are endorsed.

Why the Museum?

It is a known fact that researchers-scientists are the worst salesmen for their projects. Once their funds for research and investigation are granted, they are content to isolate themselves in their experimental environment, or with their specialist groups, communicating little with those outside of their technical area. Even if he does, his communication-discussion level creeps to levels far above the listening lay audience, leaving the would be supporters (taxpayers) cold with little understanding of what he is doing with the taxpayers' monies. Numerous articles, over the years, have spotlighted this fact and a bridge across this chasm has not yet been constructed other than by the one shot news media.

The average citizen must be informed as to the difference between NASA's effort, COMSAT consortium, and the United States Air Force's effort, what NASA is trying to accomplish, what NASA stands for, research fallout impact to the taxpayer, why the agency was established, where NASA Centers are located, what type of research is being carried on other than that of the space effort, what discoveries have been made, etc.

Recently, articles on the poor salesmanship of scientists and lack of interest in research, etc., have been published in many news media (see attachments 1, 2, 3, 4, 5, 6) and if our aerospace effort is to survive, yearly, we must do the selling by getting the message across to the average citizen by a permanent living-dynamic monument, a NASA museum.

The Russians have found that their space museum is so successful that they are now planning their second museum to keep their citizens abreast of their space effort (see attachments 7 and 8).³

Conclusion

If we are to keep the NASA operational, acceptable to, and supported by the public, every means must be used to communicate NASA information to the people, and in so doing, a NASA museum in which the attendee can have an experiential happening would be ideal, (optimum).

Greater scientific and technological advances are still at their threshold, and for future research to be choked off by the lack of understandable information reaching the taxpayers will bring this infant U.S. space age to an early death.

In closing, a quote by Mr. Gerald Wendt I feel is quite apropos. "The immediate products of science are highly valued, and research to provide more of them is handsomely supported. Yet we fail to understand on the other hand, the sources of all these miracles, or to appreciate on the other hand, the deep and pervasive social changes which they bring with them. Surrounded as we are by the products of science in the form of new materials, enormous power, numberless tools and conveniences, the age of science still lies in the future."

LETTERS TO THE EDITOR

(attachment 1)

NEW ERA

I have read your editorial "New Era for NASA" (AW&ST Aug. 7, p. 17) with interest. I agree that the space agency cannot get every penny it asks for under current conditions.

However, I think you misunderstand the mood of the public. I do not believe the general public has ever really understood the goals of the space work. Scientists apparently do not make good salesmen. It is true that if Apollo fails, it will be catastrophic for the space program. Yet, even at the height of the Mercury and Gemini successes, I believe that a large percentage, if not most, of the public did not favor the program and the large funds spent on it. In Russia, such programs can operate without widespread support, but here the public cannot be ignored for any length of time. It is only natural that politicians will make cuts where there will be the least outcry and objections. They are finding that the space program is an easy target, and you can expect more cuts.

I think a "selling job" to the public is a necessity if space work is ever to get long-range support. The scientists and space workers cannot just work away quietly in their laboratories and let their achievements on the Apollo program speak for themselves. Even if all goes well, the public reaction is going to be, "Fine, but so what?" As long as the public views the merit of the space work as mainly a "stunt" for prestige purposes. They will feel the money can be better spent on social programs. If the technological community wants any share of the tax funds, it is going to have to sell the new hardware and also the long-range goals and benefits of the space work.

The success of Apollo is essential to the "selling job" because the sale is difficult even when all goes well. But the success of Apollo, alone, will not do the job. Perhaps a space lobby is not the best method of getting the necessary support. The case for engaging in space projects is going to have to be better presented to the public itself—to the voters—if the program is to have continued support on a large or small scale. RUTH A. HALL, St. Louis, Mo.

[From the San Jose Mercury News, Aug. 18, 1968]

SPACE AGE—WAR, GHETTOS STRIKE HARD AT SCIENCE

(attachment 2)

(By Bob Lindsey)

Science in America is taking a battering from echoes of the wars in Vietnam and problems of our urban ghettos and of a president's pledge to reach the moon by 1970.

Uncle Sam bankrolls most of the nation's research in universities and industry. Now, as the country endures a financial squeeze because of Vietnam, the War on Poverty and other reasons, Uncle Sam has cut back his largesse to science—and scientists are complaining.

³ Attachment 8 may be found in the committee files.

Russia's orbiting of Sputnik I in 1957 had an effect on science and scientists like a fair godmother waving a golden wand.

Almost overnight, scientists, long regarded as dull fellows eking out a bare living while pursuing obscure objectives, became heroic figures in our society.

Congress opened up the nation's treasury to them. Scientists found they could get big contracts for the asking on virtually any trivial matter they suggested.

But this has changed. Federal spending on research and development, which hit \$16.7 billion in 1967, has dropped to about \$16.5 billion and President Johnson's pledge to cut \$6 billion from the next fiscal year's budget is expected soon to knife deep into this figure.

University scientists emphasize only about \$1.4 billion of this total finances fundamental, basic scientific research, the kind which fuels future technological progress.

And they say inflation alone raises costs 5 per cent a year so they must have this much more money yearly merely to stay even.

Palo Alto's Stanford University exemplifies the national problem. Stanford, which receives more than half of its operating funds and almost all of its research budget from Washington, faces a cut of at least 20 per cent in federal support this year.

Thus, it has about \$12 million less to keep the university running than its administrators budgeted for only a few months ago.

Some Stanford scientists face at least the threat of unemployment. Projects in which millions have been invested are now being shelved in mid-stream because of the dollar drought.

Especially hurt by the cutbacks is scientific research in the U.S. space program.

Because the National Aeronautics and Space Administration is striving to meet the 1962 vow of President Kennedy to reach the moon "before the end of this decade," NASA has pared most of its purely scientific research away so it can finance the costly Apollo moon program.

As Stanford's Nobel laureate Dr. Joshua Lederberg, a leader in the NASA exobiology effort to detect life beyond earth, commented last week.

"Apollo is the last useful element of the space program from a scientific viewpoint."

Yet, as NASA's budget was cut from \$5.2 billion to \$3.85 billion during the past 18 months, Project Apollo has been about the only major space program to survive.

Today, there are no major U.S. civilian space programs scheduled after the first landings on the moon.

In a 1962 interview, Lederberg forecast in the Mercury-News the U.S. would land a robot probe on Mars in the 1965-67 period to answer perhaps the most important and fascinating question of science—does life exist elsewhere besides earth?

This project got off the ground—but barely. It was delayed, cancelled, revived and killed again.

Now, the U.S. has no formal program to land a life-seeking capsule on any planet.

The repeated cancelling and postponing of scientific ventures by NASA when money is short has caused some discouragements among scientists who had invested their careers in this work and now see it fading away, Lederberg said.

"We wonder if we will see the results of our work in our life-time," he said.

Lederberg said he personally had foreseen the possibility of stop and go government funding and had picked out other fields of study. Also, he had meshed his development of remote laboratories to analyze Martian soil for living organisms with automated laboratories for future research and analysis on earth.

Nevertheless, he said the cutbacks are hurting some scientists—especially younger ones who haven't had time to build a reputation. In his own laboratory, he said the budget has been cut by 25 per cent. He has avoided lay-offs so-far, but expected pay-raises and purchase of new equipment is impossible.

Yet, it as it was reported last week from Washington, another billion-dollars must be cut from the budget, "we're in trouble. We're so close to the wire, another billion will kill all kinds of programs."

What will be the long-term effects of the roll back in federal largesse to science? Lederberg said it will help reduce the number of scientists at work in future years (a problem already existing because of the draft) "scientific teams will be broken up; and the nation's economy will suffer.

"Engineering work 10 years from now, which might have been done, won't be,

because of the erosion of basic science in the present. We won't feel the real effects until then," he said.

[From the San Jose Mercury News, Sept. 9, 1968]

(attachment 3)

SRI HAILS U.S. SPACE INVESTMENT

MENLO PARK.—America's long-term standing as a world power will decline if its civilian space program continues to be reduced, Stanford Research Institute said in a report released Monday.

SRI said the U.S. investment in space has had wide economic and technological benefits to the nation, but many economists have failed to recognize these benefits.

The study on "Major Impacts of the National Space Program" was financed by the National Aeronautics and Space Administration to the tune of \$87,000.

NASA has faced increasing budget cuts from Congress during the past two years, in which its appropriations have dipped from \$5.2 billion to less than \$4 billion.

SRI emphasized that the growth of NASA since 1958 has been so fast and so extensive much of its impact has been overlooked. The Space Agency, it said, has failed to convey to the public its contributions in aviation, science, electronics, medicine and other areas.

Much of the nation's position as a world leader, SRI said, results from its leadership in new technologies such as electronics, and this role will erode if space spending continues to drop.

Traditional economists, the report said, have tended to adhere to a theory that economic growth is a product of capital, labor and production.

HUMANIST THREAT

(attachment 4)

Events affecting the scientific and technical community in the past year reveal a grave trend that comes right out of C. P. Snow. The antagonism between the humanists and scientists is heating up to white heat, with the humanists winning at the scientific and technical communities' expense, and also at the expense of the society and specie they profess to defend from the scientific onslaught.

This trend is far more ominous than the negation of the B-52 as an effective weapon by the Foxbat, Flaggon, Fiddler and Bear flying radar platform. The trend is more serious than the forthcoming assumption of nuclear supremacy by the USSR next year because we "modernized" our strategic forces with cost-effectiveness studies instead of hardware. This trend is more grave than drastic reduction of all aspects of the space program, or the drastic reduction of R&D outlays, or Russia's FOBS. This trend is serious because it lies at the base of the other trends.

Talk to a "humanist" professor, or talk to one of his followers in the Congress or on the picket lines. They hate science, engineering and the people who practice such skills, and the humanists want to cut the scientists down to size in the worst way. If cutting down the scientist means weakening our deterrent to the point where it can not deter, so what? If cutting down science means curtailing "applications" satellites, so what? So what, they say. What good is your science and technology?

Back in the late 1950s, we stepped out of the dark ages as far as science is concerned. The scientific and technical community pressed its case with vigor and unity and enlisted the aid of politicians and the press at the same time. In 1960 John F. Kennedy set the nation on a course of excellence, balanced excellence in the arts, social sciences, science, technology and public services.

The Vietnam war has blurred these goals of Kennedy's, and should the liberals get in control, science and technology will be dropped from the list. So let's get together again. We are headed back into the dark ages. The Liberal Hour is coming, and so is a period of deep trouble for the scientific community.

The scientific and technical community has services that the nation and the world need. The press, the professors and the people have lost sight of this fact. The scientific community has rested on its laurels and turned against itself while the humanists have marshalled their forces together so they can suppress us again. Let us put science back on Page 1. Let us capture the public imagination as we did in the early 60s. Let it be known to all that this society needs technology to exist and grow, something the humanists are ignorant of.

Let it be known that space can be exploited for the general good. Let it be known that the seas must be mapped, biologically understood and exploited to feed and provision the expanding human race. Let it be known that R&D supplies the processes and technologies of the future. Let it be known that if we wish to avoid going to bed afraid of war, as we did in the late 50s, we must field a new strategic delivery vehicle and new aircraft and naval vessels. Let it be known that exciting discoveries are close at hand in biology, nuclear physics, metallurgy, transportation technology and other areas of science and technology.

We have serious domestic problems which must be solved, and the scientist who wants us to neglect human development is as far "off the beam" as the humanists I have referred to. The scientific community must try to avoid stooping to the level the humanists have by trying to reconcile the differences between the two camps and by aiming its endeavors to easing human problems. Until that Camelot of reconciliation is attained, however, the scientific community must stick together and vigorously advance its services and goals to the public. The scientific community must also try to prevent the bigoted humanists from using the war on poverty as an excuse for robbing the scientist of his money, his pride, and his humanity.

[From the Palo Alto Times, Sept. 17, 1968.]

SPACE AGENCY NOW TOP TARGET FOR FEDERAL SPENDING CUTS

(attachment 5)

WASHINGTON.—The National Aeronautics and Space Administration (NASA), once an area of high priority and generous funding, will suffer its fourth successive cutback in fiscal 1969.

As House-Senate conferees consider what is certain to be the lowest NASA appropriation since 1963, the agency is also being mentioned as a prime target for presidential spending cuts. The Bureau of the Budget on Sept. 9 estimated NASA's share of these possible cuts at \$100 million.

Such cuts by the President will be necessary if Congress does not carry out the fiscal 1969 spending reductions required under the Federal Revenue and Expenditure Control Act of 1968.

On Aug. 8, in anticipation of the presidential cuts, NASA made public an interim operating plan under which fiscal 1969 appropriations of only \$3,850,000,000 would be required. The action was taken in spite of the fact that the House and Senate had passed and sent to conference separate bills appropriating \$4,008,223,000.

NASA's drop on the list of national priorities has created uncertainty over the future of the agency. Administrator James E. Webb warned July 15 that NASA was approaching the end of its approved flight programs and that the time was coming when years might pass with very few NASA flights.

The NASA budget cuts have, in addition, stirred controversy over the agency's international priorities. Too much, critics say, has been spent on the relatively expensive manned space programs and too little on less expensive unmanned flights and planetary exploration.

NASA has resisted funding cuts in the Apollo man-on-the-moon project, the heart of the manned program. Since Apollo accounts for about half of the NASA budget, its effective immunity from the general congressional budget reductions has necessitated disproportionate cutbacks in other programs.

The emphasis on the Apollo project, however, could in the long run forward the cause of those who oppose the manned flights by diverting funds away from future manned programs and forcing NASA to concentrate on less expensive objectives.

Apollo Applications, the program intended to extend manned flight beyond the moon landing, has been among those hardest hit by the funding cuts. And Webb has spoken publicly of a two-year gap in the manned space program following Apollo.

NASA's interim operating plan provided only \$140 million out of a requested \$439.6 million for Apollo Applications in fiscal 1969.

While the U.S. space program was experiencing its fourth consecutive budget reduction, the Soviet Union, in the first eight months of 1968, appeared to be accelerating its space effort.

Through Sept. 4, the Soviet Union had reported 44 space flights in 1968 compared to 28 made by the United States. Additionally, the Soviet spacecraft were reported to have been of greater weight than their U.S. counterparts.

[From the San Jose Mercury, Sept. 18, 1968.]

(attachment 6)

NASA "WHIPPING BOY"

Congress and the incoming administration should pay considerable heed to the words of James E. Webb, who resigned this week after eight years as head of the National Aeronautics and Space Administration.

The Soviet Union, said Webb, now has a commanding lead in space exploration because the Soviets in the past two or three years have been expanding their program while the United States has been cutting back its own effort.

For the immediate future, Webb is doubtful that the United States will achieve the goal set nearly eight years ago by President Kennedy to place a man on the moon by 1970. For the long run, Webb sees the Soviets pushing ahead with ever-larger booster rockets and larger and more versatile space capsules.

All of which is attributable to the pressure on Congress for governmental economy coupled with the fact that NASA, even as the State Department, has no very effective constituency. Significantly, the largest budget cuts in the past few years have been made in NASA and foreign aid outlays.

In Webb's words:

"I think a good many people have tended to use the space program as a whipping boy."

They have, indeed, and the fact is both regrettable and potentially dangerous.

Webb is of the opinion that if the Soviets achieve some sort of breakthrough in space weaponry (despite their treaty pledges to desist from such activity) the United States could catch up in comparative safety. Webb is assuming that the nation's broad scientific and technological base would automatically provide this necessary lead-time.

He is probably right; certainly, every American must hope that he is right.

The Soviet Union orbited the first artificial satellite, and the Soviet Union placed the first man in space and the first multi-man team in space. Yet, the United States was able to catch up and, at a point in time approximately three years ago, even surpass the USSR in space achievements. Now, that hard-won lead has evaporated, thanks to Congress' penchant for using NASA as a fiscal whipping boy.

In the most fundamental sense, this is a penny-wise-pound-foolish policy.

Space weaponry aside, the nation has profited and will continue to profit handsomely from the scientific and technological advances that have come from research programs of NASA and other agencies. Whenever basic and applied research is cut back, man's ability to cope with his problems—both on earth and above it—is retarded proportionately.

It would be far better for the nation and for the world if Congress would concentrate its budget cuts on subsidies for corporate farmers, plug the tax loopholes enjoyed by millionaire oil barons and give NASA and similar agencies the money necessary to move the nation and its people more quickly into a better world.

THE COSMIC SPIRIT

(attachment 7)

There are three sights visible to even the most casual visitor to Moscow that offer some significant clues to how closely the Soviet citizens are identified with their national space program and why the cosmic spirit appears to have much deeper roots in the USSR than in the U.S.

First, are the tombs in the red-brick Kremlin Wall.

Second, are the advertisements of new consumer products such as wrist watches and radios labeled Vostok, Cosmonaut and Sputnik.

Third, is the permanent exhibition of Soviet economic achievement at the end of Mira Prospekt where the gleaming silver monument commemorating man's first orbital space flight soars 200 ft. over the city.

The greatest Soviet heroes of each era are buried in the Kremlin Wall. A black marble plaque marks the spot where the urn containing the ashes of each has replaced a few of the bricks. At the end of this line of Soviet heroes, when we visited Moscow a few weeks ago, were the plaques marking the final resting place of three Soviet spacemen. One is Sergei Korolev, the technical genius of the Soviet space program, chief designer of the space and ICBM rockets and of the Vostok and Voskhod spacecraft. Korolev, who died in 1966 at the age of 59, was virtually unknown outside Russian official circles in his lifetime. He wa

referred to in all press reports of his great achievements only as "the chief designer." Yet he had headed his own gas dynamics research institute in Lenin-grad since 1932 and pioneered development of liquid-fuel rockets about the same time as Dr. Robert Goddard and the German enthusiasts of Kummersdorf West. He was the chief architect of the Soviet space program that scored so many technical "firsts." Though cloaked by official anonymity in life, he now rests for all time in the Soviet Valhalla.

Another is Pavel Komarov, the first cosmonaut to lose his life in space flight. He perished with his Soyuz spacecraft when its drogue chute fouled and failed to brake his return to earth.

The third is Yuri Gagarin, the fun-loving, ebullient fighter pilot who was the first man to orbit the earth. He was killed later in an aircraft crash. The fact that these three spacemen are buried in the Kremlin Wall provides some evidence of official thinking. But what happens at the plaque of Yuri Gagarin provides a clue to the emotional feeling the Russians have for their space heroes. On the Sunday afternoon that we went to Red Square along with six other American aerospace writers to place some flowers to pass by his plaque was longer than the queue for Lenin's tomb.

Fresh flowers are an expensive commodity in Moscow. A single rose or gladiolus costs \$1. Many residents of the flower-growing areas of Georgia buy a round-trip Acroflot ticket from Tbilisi to Moscow and carry their maximum baggage allowance of fresh flowers, which they sell at a handsome profit over their air fare. When we went to purchase flowers, we told the women operating the open-air stand what we wanted them for.

"If you are really going to put them on Gagarin's tomb, will you take some along for me?" she asked.

We agreed, and she swept an armful of roses into the seven purchased for our delegation. When we reached Gagarin's plaque, the mound of fresh flowers was so high there was no room for ours. Only with the help of the security guards, in their bright blue shoulder boards, was a precarious place found atop the pile to perch the roses from our delegation and the Russian flower seller. This daily-replenished mound of expensive fresh flowers also provides a clue to how deeply the Soviet citizens identify themselves with their space pioneers.

Inside the permanent Soviet national exhibition of economic and technical progress is the finest space museum in the world (see pp. 40-43). Outside is a permanently mounted Vostok booster with its spacecraft atop the rocket clusters. Inside is a technically accurate replica of every type of Soviet spacecraft that has been launched, including the Cosmos standard booster and a wide variety of the satellites that have been orbited in this series.

Soviet citizens and foreign delegations pour through this exhibit in vast numbers. Among other things, they can peer into a Vostok spacecraft through a port-hole where the cosmonaut's head would normally be and get some feeling of what it was like to soar around the earth in that cramped sphere. They can study the detailed diagrams of the Voskhod's expandable air lock and follow Alexei Leonov's walk in space. Technical explanations of all the satellites and their experiments are in great detail. Guides are space-trained engineers who can discuss the technology in even greater detail.

Of particular interest to us was the extensive history of the pre-Sputnik Soviet space research program. It goes back through Sergei Korolev's first liquid-rocket experiments in the early thirties and rises from the intellectual wellspring of Konstantin E. Tsiolkovsky. He was the Kaluga schoolteacher whom the Russians believe was the philosopher-engineer who really kindled the fires of the space age. The Soviets are building a new space museum at Kaluga to supplement the shrine they already have made of the two-story, wooden frame house where so many of this decade's space achievements were first dreamed of by Tsiolkovsky and set down as engineering concepts. There is little doubt that the works and teachings of Tsiolkovsky have provided the Russians with an emotional drive to their national space program that has been equaled only momentarily in the U.S. The Russians know why they are in space and why they are there to stay. Tsiolkovsky wrote it for them many years ago:

"The earth is the cradle of reason, but one cannot live in the cradle forever."

Mr. KARTH. Do you have any idea when the National Aerospace Museum might be completed here on the Mall?

Mr. TAYLOR. No, sir, we don't know. It depends upon the appropriation by the Congress of the construction funds. We made a very strong effort this fall to obtain this.

Mr. KARTH. The Chairman suggests that I ask you a series of questions with respect to the procedure that has been followed, or more appropriate perhaps, not been followed.

Has the Smithsonian Institution requested funds annually since the first appropriations for this purpose were made? Have you continued to request appropriations from the Bureau of the Budget?

Mr. TAYLOR. Yes.

Mr. KARTH. What was the Smithsonian request for the fiscal years in which appropriations have been denied?

Mr. TAYLOR. I don't have that information here, but I can obtain it, of course.

Mr. KARTH. Can you supply that information for the record?

Mr. TAYLOR. Yes. I can say that for the appropriation requests and estimates for 1971, we did make a specific dollar request to begin the building, and this was not included in the President's budget.

Mr. KARTH. Do you recall roughly the neighborhood of that request?

Mr. TAYLOR. I am just recalling. I believe it was \$9 million.

Mr. KARTH. When this project was first initiated, does my recollection serve me correctly that the expected cost was \$75 million?

Mr. TAYLOR. Originally it was estimated to cost \$40 to \$42 million when the building was designed and at the time the design was completed, which was about 5 years ago, in 1965, it would have cost approximately \$42 million.

Since that time, because of the escalation of costs and the projection as to when the building might be built, the estimates are in the neighborhood of \$60 to \$65 million.

Mr. KARTH. Thank you. Please provide the budget history of this project for the record.

Information is as follows:

Funds were requested for the construction of the new building for the National Air and Space Museum as follows:

1966, \$40,045,000; 1967, \$40,331,000; 1968, \$9,500,000; 1969, \$9,500,000; 1970, Letter from the Bureau of the Budget deferred Federal construction in FY 1970; 1971, \$2,500,000.

Mr. FULTON. On page 5 of your statement you said "Gemini and Apollo spacecraft are currently touring Europe and the Far East either on a museum-to-museum basis or in cooperation with the U.S. Information Agency and the Department of Commerce. Future schedules are firm in Europe and the Far East through 1970."

I would like to have those, with the chairman's permission, put in the record to show what we are doing abroad in connection with foreign policy on this scientific deal.

There has not been emphasis put in the record as to what is done with this exhibit in the United States. With the chairman's permission, I would like this put in the record.

Mr. TEAGUE. You can have him submit it to you. I don't see that it belongs in this record that we are building.

Mr. FULTON. If we are having traveling exhibits, then the question arises: Do we need a further museum in addition to the one in Washington?

I am asking it in that connection. I am trying to get what the coverage is now of these exhibits, how they are doing it without a building and if it is being adequately done without a building, then maybe the building isn't necessary.

I would also like to point out that I have not heard very much about the Gemini and Apollo spacecraft being exhibited within the United States at various points other than space installations.

Then on page 6 of your statement, Mr. Taylor, you have a comment that the trends of future programs were being developed both in-house and under consultant contract.

With the chairman's permission, please put a statement of that in the record of how you are developing the trends of future programs in-house and under what consultant contracts so we can see what your direction is as compared to the direction of this proposed legislation—with the chairman's permission.

Mr. TAYLOR. Certainly.

Mr. FULTON. Will you submit those?

Mr. TAYLOR. I will submit those.

(The information requested follows:)

In response to Mr. Fulton's request for a statement on how the development of future programs of the National Air and Space Museum compares to the direction of the proposed legislation to study the feasibility of National Aerospace Museum for the Western United States, the following is submitted.

The staff of the NASM, together with the firm of Hellmuth, Obata & Kassabaum, Inc. of St. Louis, the architects for the new building, and the Research and Design Institute of Providence, R.I., a firm of program consultants, are developing the concept of how the new building will be employed and the opportunities it offers for extending the role of the Museum. This study is continuing; at the same time, the NASM is developing loan programs and similar relationships with other museums. The air and space craft that will be permanently exhibited in the new building will be highly selected for their historical significance. A flexible program of rotation of other planes and space components into the building will provide for important commemorative events and the development of temporary topical exhibits of current interest. In addition, the new building will provide opportunities for thematic displays on the science and technology of aerospace developments; on operational techniques, and the cultural impact of the air and space development. New exhibition techniques will provide for increased visitor participation and involvement with the technology of flight, with American contributions to aerospace, and the effect of aerospace progress on our understanding of the world and on human relations. In effect, this means that the bulk of the collections preserved for historical record and for study by historians, scientists and engineers, will be housed at nearby support facilities of the Smithsonian and not in the new building. This also means that a reasonable number of planes and spacecraft will be available for circulation to other museums and institutions. The trend is to develop these opportunities on a cooperative basis in which responsible borrowing museums will contribute the costs of effecting the loans as well as of the restoration of the craft borrowed.

The loan programs are already in existence in a small and evolving way. Twenty-two aircraft are now on loan to other museums. The NASA-Smithsonian agreement for the custody and management of NASA historical artifacts is a part of the record.

The conclusion is that aircraft and space vehicles, engines, and instruments would continue to be available in limited quantities for circulation for temporary exhibition at other museums providing necessary security and preservation are provided and the costs for circulation, repairs, and restoration are assumed by the borrower.

CIRCULATION OF SPACECRAFT FROM THE NATIONAL AIR AND SPACE MUSEUM COLLECTION, 1970

The following is the schedule of the exhibition of spacecraft from the National Air and Space Museum collection in the United States and abroad in 1970. Included are all of the presently exhibitable manned spacecraft in the collection.

Spacecraft	On display at (or en route to)—	Loan period
Mercury:		
MA-2	Planetarium, Houston, Tex.	3-year renewable.
MA-6 "Friendship-7"	Smithsonian Institution	Permanent.
MA-7 "Aurora-7"	U.S. Naval Aviation Museum, Pensacola, Fla.	Until December 1972.
MA-8 "Sigma-7"	Alabama Space and Rocket Center, Huntsville, Ala.	3-year renewable.
MA-9 "Faith-7"	NASA Manned Spacecraft Center, Houston, Tex.	Do.
Mercury LJ-5B	NASA Wallops Station, Wallops Island, Va.	Until October 1974.
Mercury SC-17	Wings and Wheels Museum, Santee, S.C.	Until June 1971.
Mercury SC-19	Community Center, Hershey, Pa.	Until Sept. 10, 1970.
Gemini:		
Gemini 2	USAF Space Museum, Patrick AFB, Fla.	Until November 1973
Gemini 3	USAF Museum, Wright-Patterson AFB, Ohio	Do.
Gemini 4	Smithsonian Institution	Permanent.
Gemini 5	NASA Manned Spacecraft Center, Houston, Tex.	3-year renewable.
Gemini 7	Atlantic City Steel Pier, Atlantic City, N.J.	Until Sept. 10, 1970.
Gemini 8	McDonnell Planetarium, St. Louis, Mo.	Until Apr. 1, 1972 (renewable).
Gemini 9	NASA Kennedy Space Center, Fla.	3-year renewable.
Gemini 11	Community Center, Hershey, Pa.	Until Sept. 10, 1970.
Apollo:		
Apollo 4	Smithsonian Institution	Permanent.
Apollo 11 command module.	On a national tour by NASA until April 1971	

DISPLAYS ABROAD

Loan of space artifacts for display overseas is made both through other Federal agencies such as U.S. Information Agency and Department of Commerce, as well as directly on a museum-to-museum basis.

Spacecraft	On display	Loan period
Mercury:		
MR-2 "Ham"	Man and His World, Montreal; P.W., Canada	Until Sept. 10, 1970.
MR-3 "Freedom 7"	Expo-70, Osaka, Japan	Through December 1970.
Mercury 15-B	Now at National Museum of Science and Technology, Canada (Sept. 1—to U.S. Naval Academy).	Until December 1970
Gemini:		
Gemini 6	Caracas, Venezuela (USIA)	Through Sept. 10, 1970.
Gemini 10	World Exhibition Center, The Hague, Netherlands.	Through December 1970.
Gemini 12	Expo-70, Osaka, Japan (USIA)	Do.
Apollo:		
Apollo 8	do	Do.
Apollo 10	Budapst, Poznan, Bucharest, USIA tour	Through October 1970.

Mr. KARTH. Mr. Chairman, on page 6 Mr. Taylor says at the end of the first sentence of the last paragraph: "* * * a second national space museum should not be created by NASA."

Is it also your judgment that the second national space museum should not be created by the Smithsonian if the Smithsonian Institution was given the authority to study and work on the proposition as opposed to NASA?

Mr. TAYLOR. No; I am inclined to agree with Dr. Low's statement that the country is large enough and that it would be desirable to have at least display areas for the temporary exhibition of museum collections in other parts of the country.

Mr. KARTH. Your disagreement is with the mechanics, rather than the idea that it might well serve the national purpose to have a second aerospace museum in another part of the country?

Mr. TAYLOR. That is exactly right.

Mr. KARTH. Would it be your feeling that a second national museum such as proposed by this legislation would have to be as large as the one proposed by the Smithsonian?

Mr. TAYLOR. I don't believe it would have to be. I would hope that in the study we are asked to make that we could develop some of these ideas. The conclusion might be to provide a large space, as indicated earlier, into which rotating exhibits would be circulated. There are a number of possibilities for combinations of a few permanent exhibits combined with topical rotating exhibits that should be explored.

Mr. KARTH. So a second national museum would not cost as much as the one to be located on the Mall?

Mr. TAYLOR. It certainly wouldn't have to. This decision would be made later on in the study, I would suspect, as we develop the criteria that would be established for its location, and whether it would be located on an airfield, in a center of tourism, or elsewhere.

Certainly all these matters would have to be explored and depending upon the site selected, the cost of the facility might be determined by that decision.

You can have a simple, plain structure on an airfield, whereas if you were locating it in a downtown city, you might have to have a more expensive and appropriate architectural development.

Mr. KARTH. Then, the Smithsonian Institution has no objection to the proposed study suggested by this legislation. Your objection really is that the Smithsonian ought to make the study rather than NASA. I think the two groups are in agreement on that.

Mr. TAYLOR. Yes.

Mr. KARTH. This study would take the better part of 2 years, in your judgment?

Mr. TAYLOR. I believe the actual field study would take about 12 months and that another 2 months should be allowed for reporting and writing it up.

Mr. KARTH. So that the 2 years suggested by this legislation would be adequate?

Mr. TAYLOR. Yes, indeed.

Mr. FULTON. If this committee recommended that the Smithsonian make such a study, could you do this within your current appropriations without additional money being necessary?

Mr. TAYLOR. No, sir; we could not.

Mr. FULTON. What proportion of the money necessary for the study would have to be added on to your current appropriation?

Mr. TAYLOR. All of the money that I have stated in this tentative estimated budget would have to be supplied. What the Smithsonian would provide is indicated in the outline of this study, a lot of consultative advice, a lot of documentation of existing museums, and a lot of information about prospective programs that might be mounted in museums.

The Smithsonian would provide a good deal of in-house expertise, but we could not provide any of the out of hand costs for the employment of a coordinator and his secretary, for the travel, for the employment of consultants, or for the employment of specialists who might assist in the economic feasibility study requested.

Mr. FULTON. It is always interesting to look at the obverse of the point. For example, if at certain installations of the United States there are surplus buildings of a large size that are easily convertible for the purpose of an aerospace museum, then the question arises, is it worthwhile or necessary to build a new, most expensive building in Washington, D.C., on the Mall for the same purpose?

Do we have the cart before the horse in that any proposed studies such as we are talking about of another location for an aerospace museum should be put off or the construction of it put off until the museum already authorized, but not appropriated for or funded, has been finished in Washington?

Mr. TAYLOR. We are strongly of the opinion that the development in air and space must be memorialized in the Nation's Capital at a place where literally millions of people come, and there is no doubt in our minds that a national air and space museum is very definitely needed and would be very appropriate in the Capital.

We are not proposing that the study of the feasibility of a museum in the western regions of the country be put off, we are simply recommending that appropriations for the conversion or construction of facilities for this not be put ahead of appropriations for the National Air and Space Museum already authorized by the Congress.

Mr. KARTH. Will the gentleman yield?

Mr. FULTON. Just 1 minute.

There is no inference in my question. I have been on the committee for the construction of the Museum of History and Technology. I think that has been a tremendous success in Washington, but the direction of my questioning has been that these outlying installations would then be no substitute for what has already been planned for the air and space museum in Washington.

Is that correct?

Mr. TAYLOR. In my opinion, sir, that is correct.

Mr. FULTON. That is all, sir.

I will be glad to yield to Mr. Karth.

Mr. KARTH. Mr. Taylor, in connection with the line of questioning that has been pursued by the gentleman from Pennsylvania, to wit, that we not start a second museum until the one that has been initially funded for on the Mall has been completed, if appropriations were again allowed, let us say in fiscal year 1971, how long, in your judgment, would it take to complete the construction of the aerospace museum on the Mall?

Mr. TAYLOR. Mr. Fulton referred to the Museum of History and Technology. He probably remembers I was closely associated with it when he used to come and view the construction as it was going on in progress. So I have had this experience in the construction of a major museum.

My belief is that if the appropriation were made—and it probably wouldn't be made until 1972 at the earliest—it would require a restudy to some degree of the plans already in hand for the museum. With this restudy and with the preparation of whatever new plans are indicated by that study, the process of then going onto the market for bids and all the other required steps, plus getting the building finally opened, I

think would probably take a minimum of 4 years from the date of the appropriation before the building would be opened with exhibits installed.

Mr. KARTH. Well, in conclusion, I merely want to say this: I am not one of those who favors studying to death a situation such as this. I think if you are talking about a proposition that involves the expansion of technological knowledge, that is one thing you may want to accommodate yourself to so you are current with the state of the art, but if you are talking about a building that is going to house the artifacts that will serve as a museum, I doubt that you have to study it to death. You just have to update it. The concept doesn't change a great deal. I would caution the Smithsonian against going into a lengthy and arduous study of what they have already restudied.

Thank you.

Mr. TEAGUE. Thank you, Mr. Taylor.

We will next hear from Colonel Hornsby, who is the director of the Air Force Museum, USAF, Wright Patterson Air Force Base, representing the Department of Defense.

STATEMENT OF COL. JOSEPH D. HORNSBY, DIRECTOR, AIR FORCE MUSEUM, USAF, WRIGHT PATTERSON AIR FORCE BASE, REPRESENTING DEPARTMENT OF DEFENSE

Colonel HORNSBY. Thank you, Mr. Chairman.

Mr. Chairman and members of the committee:

I am Col. Joseph D. Hornsby, director of the Air Force Museum, U.S. Air Force at Wright-Patterson Air Force Base, Ohio.

I am representing the Air Force as the executive agent for the Department of Defense, and I appreciate the opportunity to appear before you today to express the views of the Department of Defense on H.R. 10771, 91st Congress, a bill "To provide that the Administrator of the National Aeronautics and Space Administration shall investigate and report to the Congress as to the advisability of establishing a permanent National Aeronautics and Space Administration Aerospace Museum."

Thomas Jefferson once said, "* * * a fragment of genuine history is a thing so rare as to always be valuable." It is with this very philosophy that the Department of Defense looks upon the preservation of aerospace historical items.

Many reasons can be cited as to the value of museums in general. These same reasons can be applied across the board to museums relating to aviation and the space program. If you ask the average individual, "what value do you place on a museum?" he probably will reply, "It is an interesting place to go to learn about our past."

Certainly no one would quarrel with that answer, although a more in-depth look at museums would reveal that they not only are designed for entertainment, but to create a pride in our past, to educate or instruct, to provide historical documentation of our accomplishments, to create a sense of national pride of esprit de corps, to motivate youngsters in various fields, and so forth.

In addition, researchers often find that needed grain of inspiration for application of an old idea to a new project. For example, we at the Air Force Museum have been told on numerous occasions that we have saved aerospace designers many months in new research by having available for study a previously developed piece of hardware. Even legal matters have been resolved through items saved by the museum.

All of these reasons for the value of museums apply directly to the museum experiences of the U.S. military services.

The first step of any museum before it becomes of any value obviously is the collection of materials to be shown. For some museums this is difficult if the subject matter is prehistoric man or American Indians in the Midwest or the Civil War.

That is the one advantage of museums relating to aerospace history. The span of coverage is roughly 67 years since the first successful flight. Even with that relatively short period it is becoming increasingly difficult to locate original historic items to make meaningful collections. We are certainly at that point in our history when documentation of our space program activities could best be accomplished. At no time in the future will the job be any easier than starting today.

Thirty years ago museum attendance in the United States totaled 50 million visitors a year. Today the total is reported to be in excess of 200 million and is probably nearly 300 million. From all predictions, it appears that this increased demand on America's museums will continue indefinitely.

Surely this alone tells us concretely of the growing interest in our heritage and the need to preserve the tangible evidence of our aerospace heritage as a source of knowledge and inspiration for future generations.

At this point in time we look with awe at the first airplane flown by the Wrights at Kitty Hawk in 1903, now displayed in the Smithsonian Institution. One hundred years from now just think what interest that plane will engender. The same is true of Neil Armstrong's Apollo 11 capsule—we're thrilled to see it today, but what will it be worth in terms of interest 100 years from now?

I can truly report that the Department of Defense is vitally interested in preserving the heritage of America. We in the Department of Defense are ready to cooperate fully with the agency selected to study the advisability of establishing a permanent National Aeronautics and Space Administration Aerospace Museum. We do want to point out, however, that this matter more directly involves NASA and the Smithsonian Institution; consequently, the Department of Defense defers to those agencies.

It has been a privilege to appear before this subcommittee and to present the views of the Department of Defense on this bill.

Thank you.

MR. TEAGUE. Mr. Fulton?

MR. FULTON. Does the Department of Defense want to put up any money to help out?

Colonel HORNSBY. To help in the study?

Mr. FULTON. Well, help on anything. You are just giving us your advice. Are you ready to put any money in it?

Colonel HORNSBY. We are ready to furnish advice and assistance, in in-house expertise, that is available.

Mr. FULTON. Since you in the Department of Defense have been so active in the air portion of the scientific advance of the American people and NASA has been such a propellant in the space region as well as the old National Advisory Committee for Aeronautics, the predecessor of NASA, don't you think that you people, within your current budgets, could come up with some money to help the Smithsonian get started on a study?

Don't look so sad!

Colonel HORNSBY. I am not prepared to answer that.

Mr. FULTON. Maybe this is a three-way team, the Smithsonian comes up with part of the money in its budget, and the other two agencies come up with a little bit of money out of your current budgets, and among the three of you, we might get started on some such study.

If we are going to wait for an independent authorization of appropriation for such a study, you might be a long time waiting.

I just don't want sad looks, I just want an answer.

Colonel HORNSBY. I wouldn't be able to comment on the economics. We will assist in any way possible.

Mr. FULTON. Can you assist?

Colonel HORNSBY. I can't commit anyone economically.

Mr. FULTON. Would there be a possibility of assisting? If the Smithsonian can't do it, maybe the three of you can get it started and we can help you with some authorization money later. This is no commitment. I am just asking you for interest.

Dr. Low. I did not discuss funding in my presentation, but we have discussed this with the Smithsonian. Within the authority of the National Aeronautical and Space Act, NASA would be able to fund the study within the limits Mr. Taylor has specified.

Mr. FULTON. Thank you.

Now, how about the Air Force, now that we are having you come up to the rail?

Colonel HORNSBY. We would have to study whether we would be able to get into the economics of it. We would be able to assist in many ways, making our museum facilities available, as well as the expertise in the Department of Defense.

Mr. FULTON. With this kind of assistance, Mr. Taylor, do you think that you could make a recommendation of your interest in getting along with the study if this committee requested that you do it under the Smithsonian Institution?

Mr. TAYLOR. I think we certainly could. I see no difference really between putting it through the whole process of legislation if this committee recommends and NASA as indicated will finance it. I see no reason why we couldn't act upon a recommendation from the committee or from NASA.

A way of doing it is to suggest that NASA be prepared to request this study. Then we could simply make a proposal to NASA of what

we would need to do and NASA, in turn, could make a grant to the Smithsonian for the purpose.

Mr. FULTON. Couldn't this committee request you to make a study? Wouldn't that be sufficient, because I am talking of a three-way team? I am not talking about NASA financing it entirely. I am talking about the Smithsonian and the DOD as well as NASA going into the study under your leadership.

Mr. KARTH. On the last question, I think the committee would like to explore that. I think no legislation is required.

Mr. TEAGUE. I wouldn't expect the committee to take any action today. We would like to explore what has been said. Let us all look into it to see if we need legislation.

Mr. FULTON. Would it help you if the committee requested you to make the study?

Dr. Low. Yes, sir.

Mr. TAYLOR. It would certainly be helpful. I still have to make a statement of our position with regard to money, though. We do not have the money to do this.

I heard you, Mr. Fulton, when you said you did not expect NASA to do it all, but I think the Smithsonian would be doing a great deal, really, in managing this, recruiting the coordinator, giving advisory help to the coordinator, and keeping this study moving to a final conclusion. I think we would be contributing a great deal, but we do not have the money in our current appropriation.

Mr. FULTON. That isn't quite the point. In your basic personnel, don't you have people you can assign to follow up on the preliminary study that you have already made?

Mr. TAYLOR. Yes.

Mr. FULTON. That is all we are talking about.

How about the Air Force? Can't you likewise cooperate?

Colonel HORNSBY. Yes, very definitely. We surely can.

Mr. FULTON. How soon can you get together? Will it take 2 to 4 years, or would it take a reasonable amount of time?

I used to make my living cross-examining, Mr. Chairman.

Could we have than answer? Could you do it pretty quickly or is this 2 to 4 years in the future?

Dr. Low. NASA would have to defer to the Smithsonian. We would be able to provide the funds, hopefully split between fiscal years 1971 and 1972.

Mr. FULTON. That is all.

Mr. TEAGUE. We will be back in touch with you very soon.

Mr. KARTH. I want to make one statement.

The Colonel has been very modest on the part of the Department of Defense. On the west coast, particularly, the Air Force has a great deal to offer to the museum—missile and launch vehicle development, the Department of Defense satellites. Perhaps even a major part of that museum could exhibit Department of Defense hardware.

Thank you.

Mr. TEAGUE. We will be adjourned.

(Whereupon, at 11:30 a.m., the subcommittee was adjourned.)



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