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MEMORIAL TO DR. ROBERT H. GODDARD

GOVERNMENT

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HEARING
BEFORE THE
COMMITTEE ON
SCIENCE AND ASTRONAUTICS
U.S. HOUSE OF REPRESENTATIVES
EIGHTY-NINTH CONGRESS
FIRST SESSION
ON
H.J. Res. 597

SEPTEMBER 7, 1965

[No. 5]

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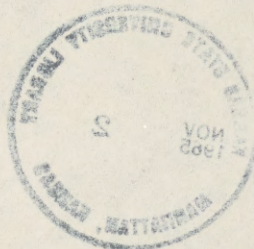
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PROVIDING FOR THE ERECTION OF A MEMORIAL TO THE LATE DR. ROBERT H. GODDARD, THE FATHER OF ROCKETRY

TUESDAY, SEPTEMBER 7, 1965

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

The committee met, pursuant to notice, at 10 a.m. in room 2318, Rayburn House Office Building, the Hon. George P. Miller (chairman of the committee) presiding.

The CHAIRMAN. The committee will come to order.

This hearing has been called to consider House Joint Resolution 597, introduced by the Honorable Harold D. Donohue, providing for the erection of a suitable memorial to the late Dr. Robert H. Goddard, considered by many of us to be the father of rocketry.

This memorial would consist of an appropriate sculpture in bronze or other enduring metal to symbolize the role of Dr. Goddard in his pioneering efforts in the space age. The memorial would be located on Clark University campus in Worcester, Mass., on a site to be donated by Clark University. The site would be adjacent to the proposed Robert Hutchings Goddard Library.

(H.J. Res. 597 follows:)

[H.J. Res. 597, 89th Cong., 1st sess.]

JOINT RESOLUTION Providing for the erection of a memorial to the late Doctor Robert H. Goddard, the father of rocketry

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the National Aeronautics and Space Administration shall erect in the Commonwealth of Massachusetts an appropriate memorial to the late Doctor Robert H. Goddard, former professor of physics at Clark University in Worcester, Massachusetts, and the father of rocketry.

The memorial shall comprise a sculpture in bronze or other enduring metal and shall symbolize the scientist's role as the pioneer of the space age. It shall be located on the Clark University campus in Worcester, Massachusetts, on a site donated by the Clark trustees adjacent to the Robert Hutchings Goddard Library. The National Aeronautics and Space Administration shall request the advice and comment of the Commission of Fine Arts and consult with Clark University trustees with respect to the design and setting of the memorial.

The memorial shall give appropriate recognition to the pioneering efforts of the late Doctor Goddard in his country's achievements in rocketry and supersonic flight.

SEC. 2. There are authorized to be appropriated such sums as may be necessary to carry out the purposes of this joint resolution.

The CHAIRMAN. I would like to call to the attention of all those present that this committee considered a similar resolution, House Joint Resolution 787, during the second session of the last Congress. This committee favorably reported out that resolution. However,

since there was some question as to the exact location of the proposed memorial and the fact that land had not been acquired or made available, the resolution was not reported to the House in time.

The question of land has been solved. I think it very appropriate that the memorial be located on the campus of the university where Doctor Goddard did so much of his fine work in rocketry which in turn has made it possible for this Nation to reach its present position in space.

This morning, as witnesses, we will have Mr. Donohue, followed by Mr. Hyde of Clark University, Mr. Dale Grubb of the National Space Club and Mr. Scheer of NASA.

Before hearing testimony, I might say that I have already received statements in support of the resolution from the Speaker of the House, Senator Kennedy, Congressmen Boland, Bates, and Morse, General Schriever and others.

Without objection, I will include some of these statements in the record of the hearings.

(The statements follow:)

STATEMENT OF HON. JOHN W. McCORMACK, OF MASSACHUSETTS

U.S. HOUSE OF REPRESENTATIVES,
Washington, D.C., August 7, 1965.

HON. GEORGE P. MILLER,
Chairman, Committee on Science and Astronautics,
House Office Building, Washington, D.C.

DEAR MR. CHAIRMAN: I am in receipt of your letter advising me that the committee will hold hearings on August 11 on the bill introduced by Congressman Donohue of Massachusetts, regarding the construction of an appropriate memorial to the late Dr. Robert Hutchings Goddard. While I will not be able to attend the hearings, I would like to be recorded in favor of this bill. I think an appropriate memorial to the memory of the late Dr. Robert Hutchings Goddard is completely justified.

With kind regards, I am,
Sincerely yours,

JOHN W. McCORMACK.

STATEMENT OF HON. WILLIAM H. BATES OF MASSACHUSETTS

Mr. Chairman, I welcome this opportunity to record my support of House Joint Resolution 597, introduced by my distinguished colleague from Massachusetts, Mr. Donohue, to authorize the National Aeronautics and Space Administration to erect an appropriate memorial to the father of rocketry, the late Dr. Robert Hutchings Goddard. The resolution calls for this monument to be located at Clark University, Worcester, Mass., where Dr. Goddard formerly served as professor of physics and did much of the pioneering toward his valuable contributions to mankind.

Like so many great men, Dr. Goddard endured and was not dismayed by disappointments and public ridicule, and he finally realized the fruits of his dream when he successfully launched the world's first liquid-fuel rocket on March 16, 1926, in the town of Auburn, Mass. Thanks to the foresightedness of the Smithsonian Institution, the invention and theories of Dr. Goddard were developed and preserved to form the basis of the vast new era of space flight and exploration, as well as defensive rocketry, which we are now privileged to share.

It is entirely appropriate that this national monument to Dr. Goddard's achievements be erected in Worcester, Mass., because it was there that he was born and graduated from Worcester Polytechnic Institute. Auburn, where his first rocket soared, is a Worcester suburb. The people of Massachusetts are especially proud of this famous son of their State, and they are happy to lend their voices and efforts to add to the honors his memory so richly deserves.

I hope, therefore, that your committee will act favorably on this joint resolution so that the Congress can permit the Nation to appreciate this permanent tribute to one of our foremost American scientists.

STATEMENT OF HON. EDWARD P. BOLAND, OF MASSACHUSETTS

Mr. Chairman, I am pleased to support Congressman Harold Donohue's resolution, House Joint Resolution 597, which would provide for the erection of a suitable memorial to America's pioneering developer of rocket propulsion, Dr. Robert H. Goddard. Robert Goddard was born at Worcester, Mass., on October 5, 1882, obtained his doctorate degree from Clark University and launched the world's first liquid propelled rocket from a farm near Auburn, Mass., on March 16, 1926. We are very proud of Dr. Goddard in Massachusetts, and, as the era of space exploration unfolds around us, the entire United States has become conscious of the remarkable achievements made by this gifted scientist.

It is worth noting that when his meager funds ran out early in the course of experimentation, he applied to the Smithsonian Institution for aid. That venerable organization requested an estimate as to how much a high-altitude rocket might cost. Dr. Goddard pondered this innocent question for several days and finally proposed an initial grant of \$5,000. As a member of the Appropriations Subcommittee which handles the NASA budgets, I have participated in the funding of billions of dollars to help give more complete and meaningful expression to national requirements for military security and leadership in space exploration, both depending on the capabilities resulting from this original project undertaken shortly before the First World War.

As is the case with many great men, Goddard was not widely recognized during his life. He was a shy and reticent New Englander. He was basically a research scientist, interested in seeking the truth about nature through his experiments. He was committed to excellence and, as a young physics professor, made important contributions to the understanding of electricity, quite apart from rocket experiments. He also had the trait of Yankee ingenuity and craftsmanship which enabled him to go into the machine shop and reduce his ideas to practical reality.

Although as a very young man at the turn of the century he speculated about achieving interplanetary flight, he shunned sensational claims for his inventions and concentrated on building a careful body of technical knowledge which could serve future scientific development. That he succeeded is attested to by the fact that no rocket could be built or launched today without incorporating one or more of the 214 Goddard patents. The U.S. Government recognized this contribution in 1960 by awarding his estate \$1 million for the use of these inventions.

Dr. Goddard served his country well. In World War I he gave up his research experiments to concentrate on developing military rockets for the U.S. Army Signal Corps, and several useful devices had been tested when the war ended. In 1940, his work became the basis for the solid-propellant rockets which were developed for jet-assisted takeoff of aircraft, early forms of the bazooka antitank weapon and artillery rockets. Shortly before his death at 63, in 1945, he was assisting the Navy at Annapolis on variable-thrust, liquid-propellant engines.

The true memorials to Robert Goddard are the powerful boosters at Cape Kennedy, lifting payloads of men and instruments in daily proof of his early thesis on "A Method of Reaching Extreme Altitudes", the modest title of a landmark paper that he submitted to the scientific community in 1920. The peaceful goal of our space program of expanding human knowledge is quite in keeping with the spirit of this dedicated and quiet scientist. It is the purpose of the memorial envisioned in this resolution to inspire our youth to the persevering pursuit of an idea despite financial obstacles and without concern for personal wealth or recognition. The proposed memorial will perpetuate the thought "It is difficult to say what is impossible, for the dream of yesterday is the hope of today and the reality of tomorrow." This, in 1904, was the creed of Robert H. Goddard. It is a fitting creed now, for our young scientists of tomorrow.

STATEMENT OF HON. SILVIO O. CONTE, OF MASSACHUSETTS

Mr. Chairman, I want to thank you and the members of the Committee on Science and Astronautics for extending me this opportunity to add my remarks in support of House Joint Resolution 597, providing for the erection of a memorial to the late Dr. Robert Hutchings Goddard, the father of rocketry. As you know, I had introduced a similar resolution myself, House Joint Resolution 426, on April 13, 1965.

There is little perhaps that I might add to what has been said and what will be said about Dr. Goddard and about his historic accomplishments. I would

stress, of course, my enthusiastic support for this resolution. But, although the name Robert Hutchings Goddard was once known to but a few men of science it has in recent years become a household word. There is little any of us might say to add to the luster of his brilliant accomplishments.

It seems altogether fitting and proper that a memorial to Dr. Goddard should stand on the campus of Clark University in Worcester, Mass., where he performed so much of his early research and experimental work. If Dr. Goddard is the father of rocketry, then Clark University may be said to have been its cradle.

What is also striking to me is the fact that Dr. Goddard not only conducted his early experiments on the Clark campus, but that he also taught classes there, and was therefore able to leave his personal imprint of great genius on the minds of young men and women fortunate enough to have enrolled in his classes. A memorial to this great man of science seems all the more fitting for the inspiration and encouragement it can provide to the young scientists of today, just as he himself inspired and encouraged so many of them two generations ago.

There can be no question of Dr. Goddard's unique niche, not only in the scientific history of this country, but in the history of the world and, indeed of the universe. He has opened the veil to the future, and it is not to our credit that we have taken so long to fully grasp the scope of his vision or the power and beauty of his dreams.

The question is frequently raised whether society owes a debt to the progressive visionaries and scientific geniuses who propel us more swiftly, more efficiently, and more comfortably down the road of history. The modest, self-effacing genius of Dr. Goddard himself would doubtless insist that the success of his work, the final realization of his dreams, is honorarium enough for his efforts. Many of these individuals gain fame and notoriety during their lifetime. But for many others, recognition does not come until many years after their death.

Sadly, this seems to have been the case with Dr. Robert H. Goddard. It is only since his untimely death in 1945 that many Americans have even heard of him. This is undoubtedly due to the fact that it is only since his death that we have been able to grasp the significance of his achievements. It is only within the last decade or so that men have truly begun to flex their fingers at the stars. We have at last begun to see in the work of Dr. Goddard the means to bring reality to the dreams of the ancients.

I am most enthusiastic about this resolution and I urge the committee to act swiftly and favorably upon it. Thank you very much.

STATEMENT OF HON. F. BRADFORD MORSE, OF MASSACHUSETTS

Mr. Chairman, these hearings by the House Science and Astronautics Committee are a tribute to the tremendous diligence and dedication of Congressman Harold D. Donohue, of Massachusetts, in insuring that Dr. Robert Hutchings Goddard will have the honor and respect to which his memory is entitled for his pioneering efforts in the field of space rocketry.

Dr. Goddard was one of the most famous sons and longtime resident of the Congressman's own hometown of Worcester. The Congressman has played an important role in calling attention to his achievements.

Only in recent years have Dr. Goddard's contributions been appreciated fully. The advances in space science and technology in recent years have dramatized the initial efforts he made as far back as 1926. He was truly a man ahead of his times.

I think that it is only fitting that a statue be erected to his memory at Clark University in Worcester. Although the Space Flight Center in Greenbelt was named in his honor, the city and the university to which he gave so much and which regard his work with great pride should be the location for a suitable memorial.

I hope that the committee will act favorably on this legislation.

STATEMENT OF SENATOR EDWARD M. KENNEDY, OF MASSACHUSETTS

Mr. Chairman, I wish to express my full support for House Joint Resolution 597 introduced by Congressman Harold D. Donohue. This resolution authorizes a memorial to Robert Hutchings Goddard to be erected on the campus of Clark University in Worcester, Mass.

Dr. Goddard's pioneering efforts in rocket research and development should be honored with a permanent national memorial. A memorial, such as would be authorized by this resolution, would serve to remind succeeding generations of Americans of this man's crucial contributions to the technology of our era. Among his scientific achievements, Dr. Goddard was the first to develop and test rocket motors using liquid fuel, liquid-fuel-powered rockets, and multistage rockets.

This memorial would most fittingly be located on the Clark University campus as an adjunct to the Goddard Library presently being planned. Dr. Goddard was born in Worcester on October 5, 1882. He was educated in the schools and colleges of Worcester. He served on the faculty of Worcester's Clark University for 29 years. He was buried in Worcester's Hope Cemetery in 1945. The memorial therefore can rightfully be located nowhere other than Worcester, and his intimate association with Clark University warrants its location on that campus.

The achievements of Dr. Goddard, although unheralded during his own lifetime, have significantly shaped the context of our Nation's space exploration program. It is altogether fitting that his life be marked by a national memorial, and it is most proper that this memorial be located on the Clark University campus. I hope this committee will act favorably upon this resolution.

STATEMENT OF GEN. B. A. SCHRIEVER

HEADQUARTERS, AIR FORCE SYSTEMS COMMAND,
U.S. AIR FORCE,
ANDREWS AIR FORCE BASE,
Washington, D.C., August 3, 1965.

HON. GEORGE P. MILLER,
Chairman, House Committee on Science and Astronautics,
House of Representatives

DEAR CHAIRMAN MILLER: I was very pleased to learn of your sponsorship of a joint resolution calling for NASA to erect a statue to commemorate the pioneering achievements of Dr. Goddard near the site of his early labors.

It is most fitting that Congress should recognize the accomplishments of Dr. Goddard in some permanent way. This proposed statue will provide for a lasting expression of appreciation from a grateful Nation.

Your support, as well as the endorsement of your committee in this effort also represents in my opinion a tribute to those who are aware of the full meaning of Dr. Goddard's legacy. It would, therefore, be a privilege to me if you would consider this letter as witness to my sincere desire to contribute in this noble endeavor.

Sincerely,

B. A. SCHRIEVER,
General, U.S. Air Force, Commander.

The CHAIRMAN. Mr. Donohue, we are very happy to welcome you here as the author of the resolution and the gentlemen in whose district Clark University is located, and in whose district Dr. Goddard once lived.

You may proceed, sir.

STATEMENT OF HON. HAROLD D. DONOHUE, A REPRESENTATIVE
IN CONGRESS FROM THE STATE OF MASSACHUSETTS

Mr. DONOHUE. Mr. Chairman and members of the Committee, I would first like to express my deep personal appreciation to you, Mr. Chairman, and to your associates on this great committee for scheduling this hearing this morning, being mindful that we are at the height of this session's legislative urgency and in the midst of daily accelerating numbers of other congressional obligations and duties that are still pending before us.

My own gratitude, I am certain, is fully shared here this morning by my congressional colleagues that you have heard from, by the officials of Clark University, by the representatives of the different

space organizations, and by many thousands and thousands of citizens throughout the country who are vitally interested in the objective of House Joint Resolution 597, providing for the erection of a memorial to the late Dr. Robert H. Goddard, one of the world's most famous pioneers in space experiment and projection, a memorial, as proposed in the resolution, to be erected on the campus of Clark University in Worcester, Mass. I am sure that the other witnesses here this morning will thoroughly reveal the most extraordinary life and almost unbelievable space achievements of Dr. Goddard, so I will not detain you here with any detailed recitation on these subjects. However, I think it may be pertinent to the record at this point, and to the objective of the resolution, to emphasize that Dr. Robert Goddard was born in the city of Worcester, that he is buried there, that he was graduated from the Worcester Polytechnic Institute, and that he received his master's degree and his doctor's degree at Clark University in Worcester, and that he was a member of the faculty at Clark for 29 years.

It was mainly during his teaching career at Clark University that Dr. Goddard developed the technique and initiated the experiments that led to the unique space accomplishments of this famous scientist.

As a result he is now held to be and is practically universally acclaimed as the father of modern rocketry. It is startling to recall and to realize that more than 50 years ago this then obscure, unknown, and even ridiculed scientist envisioned such modern projects as jet-driven aircraft, rocket-borne mail and express, and manned space travel. It has been well said that if we had the good sense and understanding to capitalize on Dr. Goddard's revolutionary inventions some 30 years ago, there is no question that we would have had an unbeatable lead in today's space race.

Mr. Chairman, may I say that it is not the sole purpose of this resolution to just give an additional honor to Dr. Goddard; it is equally or more our purpose to forever hold up this remarkable man as a true and moving example to others of the mighty heights that can be reached against discouragement and disdain by unswerving belief in one's self, by persevering study, and by persevering effort. Indeed, it is our further intention through this resolution to memorialize the excellence of his character as well as his scientific triumph.

Dr. Goddard was a man of recognized integrity in all of his private and scientific activities. He was a gentleman of vast intelligence, with a shy but warm personality and possessed of the staunchest faith, courage, and perseverance. He was a loyal and unselfish patriot who cheerfully volunteered his personal and professional service to his country in two wars, and his contributions to our military space projections and security are immeasurable. He was a devoted husband, a diligent scholar, a dedicated and enlightened teacher, and a genius of science. He had also the talents of a musician, a painter, and a poet. He was a person of broad and wholesome balanced interests. In short, he was a person and a symbol of goodness for all ages and for all times.

In my conviction, it is a major part of our duty as Members of Congress, especially in these challenging times to reasonably provide striking inspirations for the pursuit of true excellence and the acceptance of individual responsibilities to those who are now or will hereafter obscurely labor in the various fields of human endeavor. By the

adoption of this resolution I believe our common duty can be pre-eminently carried out.

With the increasing complexity of this modern world, the need for meaningful example and heroic inspiration was never greater. The life and the achievements of Dr. Robert Goddard surely offer a most unique example, a most timely inspiration. The means, through this resolution, to create such example and inspiration are reasonable and properly prudent. The full cooperation of Clark University officials is evident in their offer to donate to the Government a most appropriate and suitable site for the memorial proposed by this resolution.

In the very early stages of his experiments, Dr. Goddard wrote:

It is difficult to say what is impossible, for the dream of yesterday is the hope of today, and the reality of tomorrow.

Mr. Chairman and members of this committee, I most earnestly hope that in your considered judgment and wisdom you will see fit by the approval of this resolution to forever preserve and project for us and for those who come after us the bright, shining adventurous spirit proclaimed in those immortal words that are imbedded in the hallowed traditions of this, our great and free Nation.

I want to thank you, again, Mr. Chairman and gentlemen of the committee, for permitting me to present my thoughts on this resolution.

The CHAIRMAN. I want to thank you, Mr. Donohue, for an excellent statement. As a matter of fact, it is so good, it is one of those we could almost quit, right here, and have our case. However, there are some others here, and we will go on.

We thank you, and I am hopeful that the committee will heed your recommendation and will pass the bill out favorably.

Mr. TAYLOR. Mr. Chairman, that statement is so good that I would like to have a copy of it.

The CHAIRMAN. It will be included in the record; you can get it there.

Mr. PELLY. Mr. Chairman.

The CHAIRMAN. Mr. Pelly.

Mr. PELLY. Mr. Chairman, I am reminded of the senator of ancient Rome by the name of Cato who once said that he would rather that people would ask why there was no statue of him, than why there was a statue of him.

After listening to the testimony, I am sure that no one will ever ask why there was a statue of this great man.

Mr. DONOHUE. Thank you very much, Mr. Pelly.

The CHAIRMAN. This, incidentally, will not be a statue. Mrs. Goddard has expressed the thought that she much prefers something symbolic of space, rather than a physical reproduction of Dr. Goddard. I think this is a very generous and farsighted thought on her part.

Mr. PELLY. I agree. I used the word "statue" in the sense of a memorial.

The CHAIRMAN. That is right; a memorial.

Mr. Karth?

Mr. KARTH. Mr. Chairman, I would like to congratulate our colleague, Mr. Donohue, for the very excellent statement in favor of this resolution. While I always had extremely high regard for Dr. Goddard, I don't think that any words could better express the

affection this country holds for him, especially the scientific community, than has been expressed by our colleague. I congratulate him for having said it, and when the time is appropriate, I should be happy to make the necessary motion.

Mr. DONOHUE. Thank you.

The CHAIRMAN. Mr. Casey.

Mr. CASEY. I think our colleague has very aptly stated the reasons why this great man should be honored.

I don't want to throw any discord in here. However, I wonder if he had an opportunity to read the statement of the NASA representative that will be heard here later. NASA doesn't urge the adoption of this resolution, but merely states no objection to it while pointing out all the other memorials in honor of Dr. Goddard. Do you have any comment on that?

Mr. DONOHUE. Well, I am very mindful and very conscious, sir, that other honors have been conferred upon him by our Government, but I am not unmindful that probably in the last 50 years there is no American that has contributed more to our country and to the scientific world. This is evidenced every day when we read about our astronauts spending 8 days in space and others for shorter periods, and the things that were accomplished during World War II and that have been accomplished since, because of his persevering achievements in this field of science. I don't think this man could be memorialized too much, because of his contributions to our country and to the world, and the inspiration, Mr. Congressman, that he will be to future generations and to future ages.

Mr. CASEY. That is unquestionable. In my opinion, he is truly the father of the jet age, and the space age, and it is a shame that others didn't listen to him more closely when he was first struggling on a few dollars to carry out this mission. I daresay if we would get as much results from our dollars as he did, we would be considerably more advanced, because he was evidently a man who not only had the scientific knowledge, but also the burning desire to do it on a very low budget. So I don't argue that point with you at all. I am just bringing this up because it may be something we will face on the floor of the House.

Mr. DONOHUE. I might mention this to you, Mr. Chairman, and to the gentlemen of this committee: I was born and raised within the shadows of the spires of Clark University and as a boy I used to see Dr. Goddard frequently, and I regret to say that, like a lot of people around Worcester, did not regard him as the great man, the great scientist, that he has proven to the world to be.

Mr. CASEY. That is a case where too often a man is recognized after he has gone.

Mr. DONOHUE. So I approach this committee with a little sentimental feeling for this great man.

Mr. CASEY. I again compliment you on your statement.

The CHAIRMAN. Mr. Taylor.

Mr. TAYLOR. I would like to congratulate our colleague on an excellent and convincing statement. I don't know any statement I am more anxious to have for my records.

Mr. DONOHUE. Thank you very much. I would be very happy and pleased to furnish a copy to you.

The CHAIRMAN. You were late, Mr. Bell, so I will pass you for the time being.

Mr. Anderson?

Mr. ANDERSON. Mr. Chairman, I just wanted to associate myself with the remarks of the chairman and the other members of the committee on this most excellent statement, and certainly one of great feeling. I think that our colleague from Massachusetts, Mr. Donohue, has rendered a real service, not only to the committee, but to the actual cause of the space age, as we consider it in this overall perspective.

Mr. DONOHUE. Thank you very much.

The CHAIRMAN. Mr. Schisler.

Mr. SCHISLER. I have nothing to add.

The CHAIRMAN. Mr. Bell.

Mr. BELL. Well, I didn't hear the very excellent presentation of our good friend and colleague, but I know that whatever he would state would be very well stated, and I know this from my longtime association and friendship with his family.

The CHAIRMAN. Thank you very much, Mr. Donohue.

Mr. Robert Hyde, executive vice president of Clark University.

STATEMENT OF ROBERT M. HYDE, EXECUTIVE VICE PRESIDENT, CLARK UNIVERSITY

Mr. HYDE. Thank you, Mr. Chairman.

Mr. Chairman and members of the committee, my name is Robert M. Hyde, and I am executive vice president of Clark University and assistant secretary of the board of trustees. It is a great pleasure for me to testify here today on behalf of the university and its trustees, and to express our support of House Joint Resolution 597.

This legislation calls upon the National Aeronautics and Space Administration to erect a memorial to Robert H. Goddard on the campus of Clark University. In my remarks I should like to address myself briefly first, to the appropriateness of the proposed memorial and then, more extensively, to the appropriateness of having such a memorial at Clark.

To those in the Clark University community who have long known the Goddard story, this resolution represents the culmination of a long series of events and actions which has brought the name of Robert H. Goddard from obscurity to great national recognition. All of us here today recognize Goddard as the pioneering scientist whose theories and practical experiments laid the foundations of the space age. The list of his "firsts" is astonishing:

He was first to develop a rocket motor using liquid fuels.

He was first to develop and shoot a liquid-fuel rocket.

He was first to develop gyro stabilization apparatus for rockets, antedating the Germans by 10 years.

He was first to receive a patent on the idea of multistage rockets.

He was first to develop in detail the mathematical theory of rocket propulsion and rocket flight; and

He was first to explore mathematically the practicality of using rocket power to shoot to the moon.

Speaking at Clark University last September at the unveiling of the Goddard commemorative airmail stamp design, Postmaster General

Gronouski recalled Dr. Goddard's launching of the world's first liquid propellant rocket on March 16, 1926:

It stood 10 feet high and built up a speed of 60 miles an hour, and came back to earth 184 feet away. This historic event stands beside a great undertaking 23 years earlier when Orville Wright first coaxed an airplane into the skies above Kitty Hawk for 12 seconds. The Wright brothers reduced the size of the world; Dr. Goddard reduced the size of the universe.

Indeed, Robert Goddard was more than the Father of Rocketry—he was a 20th century Marco Polo whose vision and tenacity led him to explorations beyond man's wildest imagination. Writing in the preface of "This High Man," Milton Lehman's definitive biography of Goddard, Charles A. Lindbergh recalls his first visit to Goddard in 1929:

Sitting in his home in Worcester, Mass. * * * I listened to Robert Goddard outline his ideas for the future development of rockets—what might be practically expected, what might be eventually achieved. Thirty years later, watching a giant rocket rise above the Air Force test base at Cape Canaveral, I wondered whether he was dreaming then or I was dreaming now.

But for all of his accomplishments, Robert Goddard died relatively unknown in 1945. During his lifetime, only one signal recognition had come to him—an honorary doctor of science degree awarded by Clark University in June of 1945. Like the Wright brothers and many other trailblazers far ahead of their time, Goddard was not to be appreciated until after his death. Only in the past decade, as man has begun to probe the mysteries of space, has Goddard started to receive in full measure the public acclaim he so deserved.

House Joint Resolution 597 proposes to establish an additional honor to Dr. Goddard—a national memorial symbolizing his role as America's pioneering astronautical scientist and father of the space age. We believe that the creation of this memorial by an agency of the Federal Government—the National Aeronautics and Space Administration—is a most appropriate step on two counts. First of all, because Dr. Goddard's contributions to America's space effort have been so fundamental and extensive that further national honor—and particularly by NASA—is fully justified. Secondly, because of the fact that, as splendid as are the honors which the Government has bestowed upon Goddard—a special Congressional Medal, a commemorative stamp, the naming of the NASA Center, a proclamation of National Goddard Day in 1965—there has not yet been created a permanent national memorial, per se.

By this I mean a monument or sculpture which as a work of art, will symbolize for all times and weave into this Nation's cultural history the fact of Robert Goddard's role as America's space pioneer.

I would now like to turn to the proposed site for the memorial, the campus of Clark University, and set forth two major reasons why we believe this is the ideal location for national recognition for Dr. Goddard.

The first of these concerns the long and intimate relationship between Goddard and Clark, and the second concerns the Robert Hutchings Goddard Library at the university, which is to be the international center for original information about the pioneer space scientist.

Clark University is an independent institution of higher learning with an enrollment of 1,000 undergraduate and 300 graduate students located in the city of Worcester, Mass. It has long been inter-

nationally known among educators and scholars as an institution of high academic standards which places very great emphasis upon scholarly achievement. Its graduate programs are unusually extensive for a small institution—the doctorate is offered in 10 fields, and post-doctoral work is conducted in 2 of these. A record 85 percent of its faculty holds the Ph. D., and last year more than \$1 million in basic research was carried on in its laboratories.

At a time when American higher education seems polarized between the leviathan multiversity and the struggling liberal arts college, Clark is an interesting combination of the strengths of both. With its small faculty and student body, it maintains to a large degree the intimacy and personal relationships of the small college. At the same time, because of its concern for graduate training and research, its campus also possesses the spirit of discovery and adventure which permeates the modern university.

Clark's unusual character dates back to its beginning. At its founding in 1887 it was, except for the Johns Hopkins University, the only organized graduate school in America, and enrolled only graduate students for the first 15 years of its existence. During those years it helped found the Association of American Universities and achieved international prominence as the birthplace of the study of psychology in America. Its faculty included such academic luminaries as G. Stanley Hall in psychology, Bolza and Taber in mathematics, and Michaelson and Webster in physics. The last of these, Arthur Gordon Webster, who was one of the greatest mathematical physicists of all times, was Robert Goddard's teacher, and his predecessor as chairman of Clark's physics department.

I would like to emphasize the importance of the foregoing background to an understanding of the Goddard-Clark relationship, which began in 1908 when Goddard registered as a graduate student in physics. For at this small university Goddard found the distinguished teachers to kindle the flame of his genius and the atmosphere in which to develop his remarkable inventiveness. In 1910 he earned his M.A. from Clark and a year later his Ph. D. After 2 years at Princeton University, he returned to Clark in 1914 as a member of the faculty. For the next 29 years, until 2 years before his death in 1945, he served on the Clark faculty without interruption.

As a faculty member Goddard reveled at Clark in the milieu that was most suited to his intellectual approach—that of the individual scientist. He developed and tested his theories and built his earliest rockets in the small physics department shop. He loved to teach and, in Clark's informal atmosphere, delighted and inspired a generation of Clark students who are today among the university's proudest alumni. He wooed and won the president's secretary, who was to be not only a devoted wife but a partner in his scientific adventures for the rest of his life. In the small Clark family Dr. and Mrs. Goddard made warm friendships and found the freedom to pursue the amazing goals he had set for himself.

For long periods away from Clark, Dr. Goddard was carrying on his work in New Mexico. During those years the university provided unlimited leaves of absence, thus providing the time so indispensable to his work, without interrupting the continuing faculty relationship which Goddard once described to President Atwood as "a constant source of inspiration." Indeed, the university's unflinching confidence in Goddard throughout the years is perhaps best evi-

denced by the fact that in 1921, when funds from the Smithsonian ceased, the Clark trustees voted the modest—yet in those days sufficient—sum of \$3,500 with which to continue his work.

In the light of this long and intimate association it is clear, I think, that Clark University was Robert Goddard's academic home as a graduate student, as an inspired teacher, and as a great scientist and inventor. Clark's campus in the old New England city of Worcester is less than 2 miles from the Maple Hill farm where he was born, where he climbed the famous cherry tree, where he and Mrs. Goddard lived, and where Mrs. Goddard, now a Clark trustee, still resides. Only a few miles away, too, is the pasture—now a golf course—where the first liquid-propellant rocket was launched. And, finally, in Worcester's Hope Cemetery, Robert Goddard was buried in 1945, thus ending the saga of one of Massachusetts'—and America's—most remarkable men. Here it all happened—and here on the Clark campus, we believe, is the logical place for a national Goddard memorial.

For many years, the trustees of Clark University have wished to honor Robert Goddard not only for his genius as a pioneering scientist, but also as a dedicated teacher and scholar. In the university's planned new library building, the heart of the physical plant whose use encompasses all areas of knowledge, they have perceived the ideal tribute. Accordingly, on June 6, 1964, the university announced its plans to create the Robert Hutchings Goddard Library as the international academic memorial to Robert Goddard.

The Goddard Library, key structure in Clark's long-range development program, has been dramatically conceived in architectural terms by John M. Johansen, one of the Nation's most distinguished young architects. A splendid contemporary building combining both strength and sensitivity, the Goddard Library will house 600,000 volumes, 1,100 readers, and serve the university's eventual planned enrollment of 2,800 students.

A prominent feature of the building is to be the Goddard Memorial area. Here will be preserved for all time Dr. Goddard's personal and scientific papers which have been given to Clark by Mrs. Goddard. This priceless collection is a fascinating historical treasure chest of the beginning of modern rocketry. It includes such items as the original copies of Dr. Goddard's 214 patents, which Dr. von Braun has called "the blueprints of the space age," films of all of his rocket tests, his famous diaries, and the green notebooks in which he worked out the mathematical bases of rocket propulsion.

In this area, too, the university is planning a special Goddard exhibit hall in which, as an inspiration to future generations of Americans, the story of Robert Goddard's life and accomplishments will be told in graphic terms. As America's space program progresses and Dr. Goddard's fame grows, we expect that the Goddard Library will become an important port-of-call—indeed, another Kitty Hawk—for historians, scholars, and visitors from all over the world.

The Robert Hutchings Goddard Library is scheduled for completion in the spring of 1968. In support of this schedule the trustees of the university approved preliminary plans for the building in a special meeting on August 4, and hope to break ground in March 1966. The library will cost \$5,400,000, including minimum endowment. To secure these funds, most of which will come from private sources, the university has launched a national philanthropic program

in which many distinguished government, business, and scientific leaders have accepted roles.

Among the program's honorary chairmen are Mr. James Webb, Administrator of NASA, Mrs. Robert Goddard, Mr. Lowell Thomas, and Dr. Charles Abbot of the Smithsonian Institution. Mr. J. Leland Atwood, chairman of the board and president of North American Aviation Co., has accepted the national chairmanship of the program. Dr. Wernher von Braun heads the program's international sponsors committee, and among members of his group are Dr. Hugh Dryden, Associate Administrator of NASA, Mr. Arthur Collins, president of the Collins Radio Co., Dr. William H. Pickering, Director of the Jet Propulsion Laboratory at the California Institute of Technology, Dr. Robert R. Gilruth, Director of the NASA Manned Spacecraft Center at Houston, Congressman Harold D. Donohue of Massachusetts, and Congressman George P. Miller of California, chairman of this committee. With the interest and support of these and other distinguished Americans, the Clark University Goddard Library program is moving ahead swiftly.

The Goddard Library is to be built at the very center of Clark's campus. The Goddard area, to be located on the ground floor, overlooks the nearby science building in which the world's first liquid fuel rocket was built. In addition, this area will open out upon a terrace above a spacious lawn where Clark's commencement exercises were held for many years. Here Dr. and Mrs. Goddard sat on a June day in 1937 and heard the president of the university read a telegram from Charles A. Lindbergh praising Goddard's pioneering work.

And this is the ideal place, we at Clark believe, for the U.S. Government to erect the national memorial symbolizing Robert Goddard's historic achievements. Accordingly, on June 10, 1964, the trustees of the university voted to donate this or one of three other appropriate sites adjacent to the Goddard Library for this purpose. The trustees are prepared to deed the site to the Government, and guarantee perpetual access to it in strong support of the proposed legislation set forth in House Joint Resolution 597 to honor Dr. Robert Goddard.

Mr. Chairman, I would like to thank you and the members of the committee for permitting me to present this statement.

The CHAIRMAN. Thank you, Mr. Hyde, for a very stimulating statement with respect to this matter.

Are there any questions?

Mr. CASEY. Mr. Chairman, I would like to ask him one.

The CHAIRMAN. Mr. Casey.

Mr. CASEY. Mr. Hyde, it sounds like Clark University is indeed an outstanding school. It reminds me of one in my own hometown, Rice, which is very small, and concentrates on small classes, on arts and sciences, and lately, in the sciences.

What are the admission requirements in Clark, and how are the students selected?

Mr. HYDE. Well, sir, we are taking our students today from the top quarter to the top tenth of their classes from accredited high schools. They must present the standard 16 admissions units, and must take the Scholastic Aptitude Tests, of course. The median score for our students is in the 600 to 700 range on the verbal and mathematics tests.

Mr. CASEY. As a private institution, is it an endowed institution? Is that how it operates?

Mr. HYDE. Yes, sir. We have an endowment with a market value of \$13 million, which ranks us among the top 100 institutions in the country as far as endowment is concerned.

Mr. CASEY. Any tuitions charged?

Mr. HYDE. Yes, sir. Unlike Rice, I am sorry to say—

Mr. CASEY. Rice has changed, in case you didn't know it, as of this year.

Mr. HYDE. Unfortunately for us, they are still not in our league. Our tuition at the present time is \$1,700.

Mr. CASEY. Is there any restriction as to race?

Mr. HYDE. No, sir.

Mr. CASEY. I believe that is all, Mr. Chairman.

Thank you very much for a very interesting statement, Mr. Hyde.

The CHAIRMAN. Mr. Pelly.

Mr. PELLY. Thank you, Mr. Chairman.

I don't quite catch the picture as to the memorial. It will be, as I gather from your testimony, where there is now an open terrace?

Mr. HYDE. That is correct.

Mr. PELLY. It is not affixed or part of the library about which you spoke?

Mr. HYDE. No. The library site is at the center of the campus. The site is about 70,000 square feet, and it is going to be located on the present site of the home of the president of the university.

The result is that his terrace and very lovely garden and lawn area will eventually become part of the library site, and it is this area which we think is the most appropriate place for the memorial. Our trustees have offered four possible locations on the library site, but the location to which I referred, in my testimony, is the one on the southwest corner of the building which overlooks Dr. Goddard's original laboratory and physics building.

Mr. PELLY. Is there any thought that this might be a living memorial, some sort of memorial that would be used in any way to advance education, or would it just simply be a work of art symbolizing the achievements of Dr. Goddard?

Mr. HYDE. We have thought that this would be a work of art. I think that there are, among the many memorials which have been created to Dr. Goddard, some that are working things of one kind or another, such as the NASA Space Flight Center.

Our library itself will be a privately built working memorial, but as we have followed the course of this matter for a long time, and as our own interest in it as an institution has developed, we have felt that this would be a symbolic work of art; that really is the honor that has not yet been created for Dr. Goddard.

Mr. PELLY. I might say I was very interested in hearing about Clark. I had never even known it was such an outstanding institution.

Didn't our former Speaker, Mr. Martin, at one time try to help in raising funds for the library? He was interested I know in raising money for some library in Massachusetts.

Mr. HYDE. It was not our library. Congressman Donohue tells me it was Stonehill College.

Mr. PELLY. I must say, I am glad to know there are still some higher educational institutions that don't have enrollments up to the 10,000 and 20,000 and 30,000 students, where I think that some pupils don't quite get the same attention and develop their own potential as well as they do in an organization like yours.

Thank you very much for a very fine statement.

The CHAIRMAN. Mr. Anderson.

Mr. ANDERSON. No questions.

The CHAIRMAN. Mr. Schisler.

Mr. SCHISLER. I have nothing.

The CHAIRMAN. Thank you very much, Mr. Hyde.

Our colleague, Mr. Philbin, has now come in. We would be very happy to hear from the other distinguished gentleman from Massachusetts.

STATEMENT OF HON. PHILIP J. PHILBIN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MASSACHUSETTS

Mr. PHILBIN. Thank you, Mr. Chairman and members of the committee.

I am very thankful for the privilege of appearing before this very distinguished committee, whose great chairman, and others of your membership, have contributed so measurably in bringing the epochal achievements of the first space rocket pioneer, the late Prof. Robert H. Goddard, some of the national and worldwide recognition that he has so richly deserved.

This bill merely seeks to give our additional expression of pride and honor to the fabulous Dr. Goddard, which the Congress emphasized by the adoption of my resolution of some few years ago to strike off a gold medal in his honor.

Since that time, there has been increasing acknowledgment of his tremendously vital and memorable achievements, and the high place that he occupies in the alltime annals of science, and primarily in the science of space, so compelling to this fine committee and to all of us these days.

I could go on indefinitely singing the praises of Dr. Goddard, but this certainly is not necessary before this enlightened committee, and my dear and esteemed friend, Chairman Miller, one of the truly great leaders of the House and the Nation.

I have personally witnessed the early experiments of Dr. Goddard and, having direct knowledge of his long struggle to get the scientific world and the political world of his time to listen to him, and to realize the unbelievable importance and significance of his theories and his work, and having observed the cold shoulder and the derision that this great man had to stand from the galaxy of so-called leaders of his early time, I hail his vindication with special zest.

I viewed the adoption and implementation of his ideas with special satisfaction and pride, and I revelled in the gold medal struck off to him by the Congress; the naming of the Goddard Space Center; the issuance of a commemorative postal stamp in his honor; the dedication of a plaque to him at Fort Devens where he performed some of his early experiments, and other belated honors that were heaped upon him after he had passed from the worldly scene, with the feeling that all these things would be much more laudable, if it were not for the fact that they occurred too late.

But I suppose, Mr. Chairman, and members, that it is better late than never, and I am happy indeed that it was here in the Congress, and here in the precincts of this Government that he received early encouragement and aid when he needed it most, and more recently,

as I have described, a measure of the recognition and honors that are his due.

I suppose there is nothing unusual about this kind of treatment of great creative men and their ideas in history, because we have many examples, and we do not have to look back farther than the Wright brothers, Robert Fulton, and can recall the ill-fated philosopher-scientist, who lost his head because he said that the world was round.

Now we have another great honor which the pending bill will make possible for Dr. Goddard, and that is a suitable, scientific type of memorial at the great university where he spent so much of his time and gave so much of his great talents—Clark University at Worcester, Mass., which you have heard so ably described in detail by Mr. Hyde. We of Massachusetts are very proud of this outstanding school.

It is particularly appropriate that Clark should move to honor its most illustrious and greatest son, and I feel very strongly on the point that it is now up to the Congress to sustain and assist with this laudable and commendable objective.

The amount of money involved here is not great; in fact, it is modest, considering the high purpose this new commemoration represents. This new remembrance of the great Goddard, like those which have preceded it, will not only honor Dr. Goddard, but will also honor Mrs. Goddard, the gracious, cultured, and dedicated lady who worked with him on his discoveries, shared his disappointments and humiliations, and lived to see the fruition of his hopes and fondest dreams.

It is fitting that she also should be honored, and certainly she should be thanked and esteemed; indeed, she deserves a golden crown of gratitude and praise for all that she has done and suffered to bring to the world the incredibly momentous fruits of Dr. Goddard's creative genius.

Commending the very able and distinguished president of Clark University and all his associates and all the others who have helped to initiate and who are strongly supporting this laudable objective, I want to say, Mr. Chairman, that I wholeheartedly associate myself with Congressman Donohue's views and the views of others who have or will appear here before you in support of it, and I hope that the committee, pursuant to its constant search for truth and for fairness and for justice and for constructive achievements, will move with all possible speed to report on this bill so it can be adopted by the House and the other body before adjournment.

If this is done, I think it will be another highly justified mark of honor to this great genius of space, and also an indication of our own firm belief that Robert Goddard is entitled to take his rightful place, as he has, in the company of the great and the never-to-be-forgotten leaders of science that this world shall ever know.

I think we can all take a lesson from some of the experiences of Dr. Goddard because if the worth of his ideas had been recognized in time by high leaders of this Government, this Nation would be so far ahead in the space race that no one would ever catch up to us. I suppose that the moral of this story is that we should never underestimate or belittle creative achievement.

Mr. Chairman, I want to thank you and the members for giving me this opportunity to present my views on this highly meritorious bill, and I certainly will deeply appreciate your consideration and urge your favorable action upon this measure.

I also wish to commend my esteemed and valued friend and colleague Congressman Donohue, for his able leadership in this fine cause.

Thank you very much.

The CHAIRMAN. Thank you very much, Mr. Philbin.

Are there any questions?

Thank you.

Mr. Dale Grubb, president of the National Space Club, we welcome you here, sir, as one of the great supporters of Dr. Goddard and the things for which he stood. I want to personally express to you my own appreciation, and I am sure I speak for the committee, of the great support that the Space Club has given the space effort in this field. We are very happy to hear from you.

STATEMENT OF H. DALE GRUBB, PRESIDENT, NATIONAL SPACE CLUB

Mr. GRUBB. Thank you very much, Mr. Chairman.

Mr. Chairman and members of the committee, as president of the National Space Club and on behalf of the club's executive committee, I wish to record the endorsement of the National Space Club on House Joint Resolution 597 which was introduced by Congressman Harold Donohue of Massachusetts. We believe that this legislation which calls for the erection of a memorial to Dr. Robert H. Goddard in Massachusetts is a significant tribute to the accomplishments of the father of American rocketry.

We believe Clark University in Massachusetts is a most appropriate site for a memorial.

Dr. Goddard was a native son of Massachusetts, born and educated at Worcester. It was in the State of Massachusetts that Dr. Goddard conducted much of his original research and testing in rocketry, and served at Clark University as a faculty member in physics for some 29 years.

It would seem then a memorial suitably placed in the land of his boyhood where he began fundamental studies for his early achievements would truly be an inspiration for the future generations of scientists. It was while he was teaching at Clark and carrying on his research that he conducted his historic March 16, 1926, firing of a liquid fuel rocket, and took out his first patent entitled "Rocket Apparatus."

The National Space Club has always been interested in seeing appropriate recognition be accorded to Dr. Robert H. Goddard, father of American rocketry. During the past year the club played an important role in the Post Office Department's issuance of the Goddard commemorative airmail stamp and also initiated the suggestion that legislation be introduced which resulted in President Johnson's proclamation of March 16, 1965, as National Goddard Day.

We sincerely hope that appropriate legislation will again be introduced to proclaim next March 16 as National Goddard Day, which will mark the 40th anniversary of the first firing of the liquid fuel rocket.

This committee is also aware that Dr. Wernher von Braun has been named Chairman of the International Sponsor's Committee of the Robert Hutchings Goddard Library program at Clark Univer-

sity. Announcements of Dr. von Braun's appointment was made by Clark University President Dr. Howard B. Jefferson, at the May 19 National Space Club luncheon here in Washington, where Dr. von Braun was the guest speaker.

Finally, the National Space Club feels that this is a worthy tribute to a pioneer of the space age and pledges its support on this important and appropriate legislation.

Thank you, Mr. Chairman, for giving the National Space Club the opportunity to endorse this very important and appropriate legislation.

The CHAIRMAN. Thank you for a very fine statement, Mr. Grubb. Mr. Teague?

Mr. TEAGUE. No questions.

The CHAIRMAN. Mr. Casey.

Mr. CASEY. No questions.

The CHAIRMAN. Thank you very much.

The next witness is Mr. Julian Scheer, Assistant Administrator for Public Affairs of the National Aeronautics and Space Administration.

We are always happy to have Mr. Scheer here. We congratulate him on the fine work he is doing, and the knowledge that he has which has sprung out of our mutual effort. It is nice to have you here.

STATEMENT OF JULIAN W. SCHEER, ASSISTANT ADMINISTRATOR FOR PUBLIC AFFAIRS, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Mr. SCHEER. Thank you very much.

Mr. Chairman, Mr. Casey has alluded to my statement, and I think the members of the committee have it, and it is virtually the same as I gave in 1963. I will submit it for the record, if you have no objection, and I will answer any questions.

(The statement referred to follows:)

STATEMENT OF JULIAN SCHEER, ASSISTANT ADMINISTRATOR FOR PUBLIC AFFAIRS, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Mr. Chairman and members of the committee, in the annals of modern science and engineering, few men can rival Dr. Robert H. Goddard as an inspiration. This quiet man whose life story reads almost like fiction has opened avenues of science and technology unequaled in human history. Because of his contributions a grateful nation has paid him honor.

The matter before this committee today, House Joint Resolution 597, is another recognition of Dr. Goddard's contributions and accomplishments. The legislation would require the National Aeronautics and Space Administration to erect an appropriate memorial to Dr. Goddard: a sculpture of bronze or other enduring metal, to be located adjacent to the Robert H. Goddard Library on the campus of Clark University in Worcester, Mass., where Dr. Goddard once taught.

It is rather difficult to estimate the cost of such a memorial, owing in part to the broad definition of the word "sculpture," which could be equally applied to a simple bas-relief or a statue of heroic proportions. On the basis of a conversation with a member of the Fine Arts Commission, a memorial might cost \$50,000 to \$150,000 or more.

The National Aeronautics and Space Administration has no objection to the passage of this legislation. It would be appropriate to note, however, that there have been at least a score of memorial recognitions paid to Dr. Goddard already, including several since earlier legislation on this same subject was introduced in December 1963. Here are a few typical examples:

(1) A major NASA installation—the Goddard Space Flight Center, Greenbelt, Md.—was named after Dr. Goddard in recognition of his pioneering research.

(2) The Dr. Robert H. Goddard Medal was awarded by the Congress, under the provisions of the act of September 16, 1959 (73 Stat. 562), in high recognition of his achievements.

(3) Designation by the President, at the request of Congress, of March 16, 1965, as Goddard Day, with resulting ceremonial recognition being accorded to Dr. Goddard at NASA centers and elsewhere throughout the Nation.

(4) Issuance of the Goddard memorial postage stamp by the U.S. Post Office on September 24, 1964.

These are only a few of the most important and most recent tributes paid to Dr. Goddard. Other recognitions worthy of mention include the American Institute of Aeronautics and Astronautics Goddard Award; the National Rocket Club's Goddard Memorial Trophy; the American Rocket Society's Goddard Memorial (a marker at the site of the first rocket flight); and athletic field; an oval on a military reservation; a powerplant; four schools; a tower; two streets; an industrial center, a professorship; a library; and numerous awards and prizes.

Mr. SCHEER. As you well know, we all in this room and all of us in the program stand in awe of Dr. Goddard. NASA has stated no objection to the passage of this legislation. Dr. Dryden has taken the lead, I think, in many of the memorials mentioned here today and Dr. von Braun and Mr. Webb are very active in the project to build a Goddard Memorial Library at Clark University, which we feel is most appropriate, and I am here at your pleasure, sir.

The CHAIRMAN. Thank you, sir.

Any questions?

Mr. KARTH. Mr. Chairman, Mr. Casey has indicated that the statement shows somewhat less than enthusiastic endorsement of the bill. I was just wondering whether or not that lack of enthusiasm primarily comes about as a result of the cost that is involved?

Mr. SCHEER. Yes, I think that is a proper assumption, Mr. Karth.

The CHAIRMAN. Mr. Pelly.

Mr. PELLY. I have two questions I would like your comments on. One has to do with the bill as printed. On page 2, line 4, reference is made to the Commission of Fine Arts. I wondered if there should be a more specific designation as to which commission this is. I assume there are a great many commissions of fine arts throughout the country. Is that the one in Massachusetts or the one in the District of Columbia?

Mr. SCHEER. That would be the Presidential Commission.

Mr. PELLY. The Presidential one?

Mr. SCHEER. Yes.

Mr. PELLY. Well, I think the record should show that.

The CHAIRMAN. Mr. Pelly, Mr. Gerardi informs me that he had called the Commission on Fine Arts and asked them what their exact title was and he was informed it was just the Commission on Fine Arts. So I think this answers your question and the record will pinpoint whom we mean by this commission.

Mr. PELLY. In other words, the report on the legislation would specify it is the one and only Commission on Fine Arts?

The CHAIRMAN. That is right.

Mr. PELLY. My other question has to do with the open-end authorization which might very well have some bearing on your coolness on account of cost. This language provides that "it is authorized to appropriate such sums as may be necessary," which could be millions of dollars, if the Commission of Fine Arts should recommend such a thing.

I think when it comes to the floor of the House for consideration, or in the Senate, there might be some question as to the wisdom of not placing a limitation.

I wondered if your agency would object if we put in a limitation, such as "not to exceed \$150,000?"

Mr. SCHEER. That is not in my bailiwick, Mr. Pelly. Our assumption is that it will be a suitable memorial, and would be in that ball park. We would estimate anywhere from \$50,000 to \$150,000 as being what was in the mind of Mr. Donohue.

The CHAIRMAN. I would refer you again to the report which will provide for a maximum of \$150,000.

Mr. PELLY. Mr. Chairman, do you think that it would satisfy Members of the House if it were in the report, rather than just simply adding the language, "such sum not to exceed \$150,000" in the bill? If it were in the language of the bill, it might be easier to satisfy some Members on the subject. Of course, we could take that up when it comes to executive session.

The CHAIRMAN. Yes, in executive session.

Mr. PELLY. That is all.

The CHAIRMAN. Thank you.

Any other questions of Mr. Scheer?

Mr. CASEY. Yes, Mr. Chairman.

The CHAIRMAN. Mr. Casey.

Mr. CASEY. Mr. Scheer, of course I am sure your position is to be as objective as possible in your statement, namely that you are not opposed to the bill although you list various honors that have already been awarded this great man, without giving their locations. I am interested whether any of these you have listed are located at or near Clark University or Worcester, Mass?

Mr. SCHEER. Yes, Mr. Casey, we have the Robert H. Goddard Industrial Center, which is at Worcester. There is the American Rocket Society Memorial Marker, at Auburn, close by.

Mr. CASEY. Is this industrial center a community project, or just some real estate development; do you know?

Mr. SCHEER. I do not know.

Mr. HYDE. I can tell you. It is an industrial park composed of a number of small manufacturing plants. It is strictly a local park and it merely bears his name.

Mr. CASEY. Whoever developed the project may have thought it was a good idea to promote and encourage industry to locate there. We know real estate developers have done that. Is that what it is, or is it a thing of beauty that really honors this great man?

Mr. HYDE. I would say as industrial plants go, it is fairly attractive, but I would not want to call it a thing of beauty.

Mr. CASEY. It will be something that in time may disappear; is that right? Something else may spring up there?

Mr. HYDE. Very definitely; yes.

Mr. CASEY. How about the tower you mentioned here? Where is that, and what is it?

Mr. SCHEER. It is at Fort Devens, Mass., where Dr. Goddard did his early testing in 1920 to 1930.

Mr. CASEY. What kind of tower is it? Is it a memorial tower?

Mr. SCHEER. I have not seen it. It is called a memorial tower with a replica of his first rocket, and here, again, Mr. Donohue or Mr. Hyde may be able to enlighten you.

Mr. CASEY. Is this a work of art or something that will be a permanent memorial to this great man?

Mr. SCHEER. I can't answer the question because I am not familiar with the tower.

Mr. CASEY. I am personally interested in it. Would you furnish it to me?

Mr. DONOHUE. Mr. Casey, if you will pardon me, I know that Congressman Philbin would be very familiar with that tower at Fort Devens, because Fort Devens happens to be located in his congressional district.

Mr. CASEY. Do we have any permanent work of art in memory of this great man at the Goddard Center?

Mr. SCHEER. We have a bronze bust of Dr. Goddard in the lobby.

Mr. CASEY. Of course, that can be moved and disappear when the buildings or the use of the land changes; is that correct?

Mr. SCHEER. Yes, sir.

Mr. CASEY. What we are considering here is a permanent work of art to commemorate this great man. Do we have any permanent work of art that you know of that will stand as a tribute to this man's great achievements and to this great scientist anywhere in the United States?

Mr. SCHEER. I think this is perhaps a matter of definition. I would say that in the mind of the author of this bill no, there is not a physical presentation anywhere in the United States such as a statue, a replica of anything that would be as appropriate as suggested under this legislation.

Mr. CASEY. There is not going to be any statue in this. It is going to be something symbolic and a work of art that is supposed to call attention to this great man and his achievements and so far as you know, we don't have anything like that, do we?

Mr. SCHEER. No, sir.

Mr. CASEY. This tower isn't such?

Mr. SCHEER. No, sir.

The CHAIRMAN. Will the gentleman yield?

Mr. CASEY. Yes.

The CHAIRMAN. I would say that with regard to the tower erected on a military installation such as Fort Devens, which in my time was known as Camp Devens, the land could be declared surplus in the event that we reach that peace which we are all looking for, just as any other military installation may be declared surplus, and the tower would go with the land.

Mr. CASEY. Mr. Chairman, that is what I am trying to point out; that most or all of these honors he has listed in his statement can disappear. Street names can be changed, schools become obsolete and torn down, and of course, even the great Goddard Center can change and disappear. I see nothing of any permanent nature listed, and that is one thing I wanted to point out, because you and I know that there is a gentleman on the other side of the aisle on the floor that likes to question these things, and with a list like this, he might think we already have something suitable for this great man.

The CHAIRMAN. I thank the gentleman for making the record in this case. I may point out that one of the great men in the past who made a substantial contribution to our defense, Dahlgren, is almost forgotten. Very few people know who he was and what he was, and yet Dahlgren invented the rifle. There is a question of whether we would be where we are today without his contribution. But he seems to have vanished. Many of the great inventors of this country have

been forgotten in time, even though their inventions created work that helped us greatly.

Where do you find a statue of Fulton? Perhaps you will find one down in the Smithsonian Institution, but one could go on ad infinitum about inventors and great men who have done many of these creative things without proper recognition.

I would like that to be part of the record.

Mr. CASEY. To continue my position as a devil's advocate, I think that Clark University has been established long enough that it looks like it is going to be permanent.

The CHAIRMAN. I think so.

Mr. CASEY. Thank you.

The CHAIRMAN. Any other questions?

Mr. TAYLOR. Mr. Chairman?

The CHAIRMAN. Mr. Taylor.

Mr. TAYLOR. You were asked about this privately owned industrial center, and you mentioned it, as a recognition of Dr. Goddard which was located near Clark University. Was that constructed for the purpose of honoring his name, or did they just use his name for promotional purposes?

Mr. HYDE. The latter is the case.

Mr. DONOHUE. It is probably 6 miles from Clark University, sir.

Mr. TAYLOR. So it is not a permanent recognition of him, at all?

That is all, Mr. Chairman.

The CHAIRMAN. If there are no further questions, thank you very much.

I would like, without objection, to have permission to put into the record statements in support of the bill submitted by Senator Saltonstall, Mr. Martin, and others, and without objection we will leave the record open for 3 or 4 days so that other people will have an opportunity of preparing and submitting their statements.

If there is no objection, that will be the case.

(The statements referred to follow:)

STATEMENT OF HON. JOSEPH W. MARTIN, JR., OF MASSACHUSETTS

Mr. Chairman, I am happy to record my support for House Joint Resolution 597, the Donohue bill being filed by this committee calling for the erection of a memorial to the late Dr. Robert H. Goddard on the campus of Clark University in Worcester.

In honoring the late Dr. Goddard, we honor all dedicated teachers who relentlessly pursue new truths. We honor universities which, like Clark, stand by the loyal faculty members whose knowledge is the lifeblood of their teaching. We honor men of science who dream of distant horizons and who labor with self-sacrifice to reach them.

Dr. Goddard was a rare teacher. He was a rare scientist. He pursued his goals in rocketry with a dedication unmatched in human history. Almost 50 years ago, he believed that man could—and would—reach the moon, when such a thought was generally regarded as a sure sign of lunacy. But his dreamed-of goal is now nearly within the reach of new rockets—which fly according to the scientific rules which he discovered.

My attention was called to this remarkable man by the publication a few years ago of his official biography. I filed the first bill at that time calling for this memorial. I felt that the man and the home State that produced him and stood by him should be jointly honored. I appreciate the warm support that this committee has given the legislation. The memorial to be authorized by our bill should be a worthy tribute.

STATEMENT OF HON. JAMES C. CLEVELAND OF NEW HAMPSHIRE

I appreciate this opportunity to express to your distinguished committee my complete support for House Joint Resolution 597, which is similar to legislation I introduced in the last Congress (H.J. Res. 799, 88th Cong.). This measure, cosponsored by the gentleman from Massachusetts Mr. Martin was approved by this committee but, unfortunately, no further action was taken by the Congress.

My bill did not specify that such a memorial be erected at Clark University in Worcester, Mass., where Dr. Goddard was a physics professor for many years. This direction is contained in House Joint Resolution 597 and is entirely appropriate, in my opinion.

There can be no doubt that Dr. Goddard was the father of rocketry. I was a member of the House Select Committee on Government Research, which functioned during the 88th Congress, and heard James E. Webb, Administrator of the National Aeronautics and Space Administration, testify that:

"* * * the development of the rocket engine as we know it today stemmed from theoretical work done by Dr. Robert Goddard at Princeton University in 1916 and his later experimental proof in 1926 of the practicability of the use of liquid oxygen carried in the rocket and the efficiency of the multistage concept. Dr. Goddard's developments gave mankind a radically new engine that could develop its power in a vacuum and thus permit flights out beyond the earth's atmosphere and into space * * * the United States did not develop Dr. Goddard's concepts, but the Russians and the Germans did. The German V-2 rockets of World War II and the Russian intercontinental ballistic missiles of the 1950's were the dramatic results."

Leading German scientists, among them Dr. Walter Dornberger, who commanded the German rocket research center at Peenemunde, where the V-2 was developed, and Dr. Wernher von Braun, who helped develop the V-2, have testified to the vital importance of Dr. Goddard's pioneering studies to their work. In listening to their accounts, and to Mr. Webb's statement, one is struck painfully by the lack of vision demonstrated by authorities in this country at the time Dr. Goddard was working and presenting his demonstrations. Not for the first time in our history, American know-how was first and best, but unrecognized at home. This is a subject perhaps more suitable for a broad essay than for statement such as this, but the point is valid here: we must not make such mistakes again.

The presence of a suitable memorial to Dr. Goddard, set at Clark University in the scenes of many of his accomplishments and where his friends and colleagues, at least, recognized and supported his work, will serve not only as a personal tribute to his genius, but as a continual reminder to the country against repeating our past mistakes. The Federal Government's research budget is upward of \$15 billion a year. We should remember that not only is research important but that it is also important to capitalize on the results quickly, wisely, and well.

I urge adoption of this bill.

STATEMENT OF SENATOR LEVERETT SALTONSTALL, OF MASSACHUSETTS

U.S. SENATE,
COMMITTEE ON APPROPRIATIONS,
September 7, 1965.

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

MY DEAR MR. CHAIRMAN: I am pleased to have this opportunity to express my support for legislation which would authorize the construction, in my own State of Massachusetts, of a suitable memorial to Dr. Robert Hutchings Goddard, the father of modern rocketry. I have introduced a similar proposal in the Senate. Earlier in this session of Congress I sponsored legislation, which has since been enacted into law, to honor the memory of Dr. Goddard and his contributions to the whole spectrum of scientific knowledge by designating March 16, 1965, the 39th anniversary of the launching of the first liquid-propellant rocket, as Goddard Day.

The achievements of Dr. Robert Goddard and his associates in the early years of the space age are well known to us all. Without his basic research efforts and his persistent attempts to test and launch experimental rockets, the U.S. space program would have attained neither the status nor the scope it has today.

We in Massachusetts are proud of Dr. Goddard and what his theories and his experiments have meant to scientific progress during this century. I, therefore,

think it most fitting that the Congress should authorize the erection of a statue to his memory in Massachusetts, to serve as a lasting reminder to this and future generations of Americans of the many accomplishments and contributions of this pioneer of the space age.

I am hopeful that your committee will act favorably on this legislation. With kind regards, I am,

Sincerely,

LEVERETT SALTONSTALL, *U.S. Senator.*

STATEMENT OF HON. RICHARD L. OTTINGER, NEW YORK

Mr. Chairman and members of the committee, it is my pleasure today to present testimony in support of House Joint Resolution 597, which calls upon the National Aeronautics and Space Administration to erect a memorial to Dr. Robert H. Goddard on the campus of Clark University, in Worcester, Mass.

Dr. Goddard is considered by layman and scientist alike to be the father of rocketry. A memorial in his honor would be fitting tribute to his years of research and experimentation.

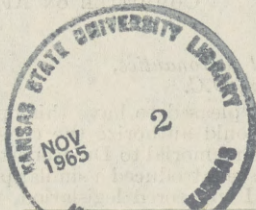
One of Goddard's earlier important projects was to demonstrate the theory that the rocket would operate without any air to push against, that it could go through the airless voids of space. He did this despite the firm beliefs of his contemporaries that he had gone off the track. Another accomplishment which was looked upon askance was the development of a submarine detector. In addition, along with Hickman, he demonstrated the infantryman's personal artillery which was to lead, in World War II, to the tank killing bazooka projector. Neither of these experiments was noted favorably by the military in World War I. Following Dr. Goddard's efforts to prove the virtue of the recoilless rocket, the Army did develop, in World War I, a high velocity rocket to be fired from planes, but the war was over too soon to prove its effectiveness, and the rocket was forgotten until World War II.

In our recent experiments with flights to the moon, we are further reminded of Dr. Goddard's work. He was the first to explore mathematically the practicality of using rocket power to shoot to the moon. As Robert M. Hyde, executive vice president of Clark University, so aptly testified, Robert Goddard was "more than the father of rocketry—he was a 20th century Marco Polo whose vision and tenacity led him to explorations beyond man's wildest imagination." Indeed, his explorations are far too numerous for me to mention all in one statement.

Had Dr. Goddard lived to demonstrate the vital importance of rocket power, our position in the space race might be quite different. Dr. Goddard was, assuredly, far ahead of his contemporaries.

The CHAIRMAN. The committee will go into executive session.

(Whereupon, at 11:20 a.m., the committee proceeded to executive session.)



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