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THE WHITE HOUSE

TEXT OF THE ADDRESS BY THE PRESIDENT,  
DELIVERED FROM THE PRESIDENT'S OFFICE,  
IN THE WHITE HOUSE, THURSDAY EVENING,  
NOVEMBER 7, 1957, AT 8:00 P. M. EST

SCIENCE IN NATIONAL SECURITY

My subject tonight is Science in National Security.

Originally this talk was to be part of one I intend to make in Oklahoma City next week. However, I found that I could not possibly deal with this subject in just one address. So tonight I shall concentrate on the most immediate aspects of this question of the relationship of science to the defense of our country.

Let me tell you plainly what I am going to do in this talk and those to follow.

I am going to lay the facts before you -- the rough with the smooth. Some of these security facts are reassuring; others are not -- they are sternly demanding. Some require that we resolutely continue lines of action now well begun. Others require new action, and still others new dimensions of effort. After putting these facts and requirements before you, I shall propose a program of action -- a program that will demand the energetic support of not just the government but every American, if we are to make it successful.

I.

First: some facts about our present security posture. It is one of great strength -- but by no means should this assurance satisfy any of us. Our defenses must be adequate not just today, but tomorrow and in all the years to come, until under the safety of these defenses, we shall have secured a durable and just peace for all the world.

As of now, the United States is strong. Our nation has today, and has had for some years, enough power in its strategic retaliatory forces to bring near annihilation to the war-making capabilities of any other country.

This position of present strength did not come about by accident. The Korean War had the effect of greatly expanding our peacetime defense forces. As we began the partial demobilization of these forces we undertook also an accelerated program of modernization.

As a first step, scientific surveys were instituted soon after the Korean Armistice. The result was a decision to give a "New Look" to the defense establishment, depending for increased efficiency more upon modern science and less upon mere numbers of men.

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In succeeding years there has been an across-the-board program to bring all units of our defense into line with the possibilities of modern technology. There has been, also, a high level of expenditure on research and development for defense -- now running in the aggregate at something over \$5 billion dollars a year.

Later, scientific surveys focused attention and emphasis on long range ballistic missiles. Development on this item got into high gear more than two years ago. We have since been spending a billion dollars a year on this item alone.

Before discussing some of the things we urgently need to do, I would like to give you a few samples of the things that have been done in recent years by our military forces, scientists and engineers to put current scientific discovery at the service of your defense.

In our diversified family of missiles, we have weapons adapted to every kind of distance, launching and use. There are now thirty-eight different types either in operation or under development.

All combat vessels of the Navy built since 1955 have guided missiles in place of, or to supplement, guns. The Navy has in both oceans, submarines which can rise to the surface and launch, in a matter of minutes, a missile carrying a nuclear warhead, and submerge immediately -- while the missile is guided to a target hundreds of miles away.

The Navy possesses an atomic depth bomb.

Since Korea, both the Army's and Navy's anti-aircraft guns have been largely replaced by surface-to-air missiles. All of our new interceptor aircraft are armed with air-to-air missiles.

Many of the traditional functions of the Army's artillery and support aircraft have been taken over by guided missiles. For example, we have already produced, in various distance ranges, hundreds of Matador, Honest John and Corporal missiles. To give you some idea of what this means in terms of explosive power: Four battalions of Corporal missiles alone are equivalent in fire power to all the artillery used in World War II.

Some of these missiles have their own built-in mechanisms for seeking out and destroying a target many miles away. Thus, the other day, a Bomarc missile, by itself, sought out a fast-moving, unmanned airplane 45 miles at sea and actually met it head-on.

Except for a dwindling number of B-36s, there is hardly an airplane in the combat units of the Air Force that was in them even as late as the Korean conflict. The B-52 jet bomber, supported by its jet tankers, is standard in our Strategic Air Command. Again, to show you what this means in terms of power: One B-52 can carry as much destructive capacity as was delivered by all the bombers in all the years of World War II combined. But the B-52 will, in turn, be succeeded by the B-58, a supersonic bomber.

Atomic submarines have been developed. One ran almost sixteen days without surfacing; another cruised under the polar ice cap for over five days.

A number of huge naval carriers are in operation, supplied with the most powerful nuclear weapons and bombers of great range to deliver them. Construction has started which will produce a carrier to be driven by atomic power.

Since 1956 we have developed nuclear explosives with radioactive fall-out of less than 4 percent of the fall-out of previous large weapons. This has obvious importance in developing nuclear defenses for use over our own territory.

In numbers, our stock of nuclear weapons is so large and so rapidly growing that we are able to disperse it to positions assuring its instant availability against attack, and still keep strong reserves. Our scientists assure me that we are well ahead of the Soviets in the nuclear field, both in quantity and in quality. We intend to stay ahead.

We have already shown that we can, with the precision to make it a useful military weapon, fire a large ballistic missile well over a thousand miles. Our ballistic test missiles have had successful flights to as much as 3,500 miles. An intercontinental missile is required, and we have some of them in an advanced state of development. But, because of our many forward positions, for us an intermediate range missile is for some purposes as good as an intercontinental one.

A different kind of missile, the air-breathing Snark, recently travelled over a guided course for 5,000 miles and was accurately placed on target.

We have fired three rockets to heights between 2,000 and 4,000 miles, and have received back much valuable information about outer space.

One difficult obstacle on the way to producing a useful long-range weapon is that of bringing a missile back from outer space without its burning up like a meteor, because of friction with the earth's atmosphere.

Our scientists and engineers have solved that problem. This object here in my office is an experimental missile -- a nose cone. It has been hundreds of miles to outer space and back. Here it is, completely intact.

These illustrations -- which are of course only a small sample of our scientists' accomplishments -- I give you merely to show that our strength is not static but is constantly moving forward with technological improvement.

Long range ballistic missiles, as they exist today, do not cancel the destructive and deterrent power of our Strategic Air Force.

The Soviet launching of earth satellites is an achievement of the first importance, and the scientists who brought it about deserve full credit and recognition. Already, useful new facts on outer space have been produced, and more are on the way, as new satellites with added instruments are launched.

Earth satellites, in themselves, have no direct present effect upon the nation's security. However, there is real military significance to these launchings, which I have previously mentioned publicly. Their current military significance lies in the advanced techniques and the competence in military technology they imply, evidenced, for example, by the powerful propulsion equipment necessarily used.

But in the main, the Soviets continue to concentrate on the development of war-making weapons and supporting industries. This, as well as their political attitude in all international affairs, serves to warn us that Soviet expansionist aims have not changed. The world has not forgotten the Soviet military invasions of such countries as Finland and Poland, their support of the war in Korea, or their use of force in their ruthless suppression of Hungarian freedom.

Eternal vigilance and increased free world military power, backed by our combined economic and spiritual strength, provide the only answer to this threat until the Soviet leaders themselves cease to consume their resources in warlike and expansionist purposes and turn them to the well-being of their own peoples.

We frankly recognize that the Soviets are building up types of power that could, if we were attacked, damage us seriously. This is because no defensive system today can possibly be air-tight in preventing all break-throughs of planes and weapons.

To aid in protecting against this, we, in partnership with Canada, have long been constructing a continental defense system reaching from far out in the Pacific around the northern edge of this continent and across the Atlantic approaches. This is a complex system of early warning radars, communication lines, electronic computers, supersonic aircraft, and ground-to-air missiles, some with atomic warheads. This organization and equipment is under constant improvement; emphasis on this improvement must be increased.

In addition to retaliatory and continental defense forces, we and our allies maintain strong ground and naval units in strategic areas of the world. In the strength and readiness of all these varied kinds of power -- retaliatory, defensive and local -- properly distributed and supported, lies the real deterrent to the outbreak of war. This fact brings home to all of us the tremendous importance to this country of our Allies. Not only do they maintain large military forces as part of our combined security, but they provide vital bases and areas that permit the effective deployment of all our forces for defense.

It is my conviction, supported by trusted scientific and military advisers, that, although the Soviets are quite likely ahead in some missile and special areas, and are obviously ahead of us in satellite development, as of today the over-all military strength of the free world is distinctly greater than that of the communist countries.

We must see to it that whatever advantages they have, are temporary only.

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II.

The next question is: How about the future?

I must say to you, in all gravity, that in spite of both the present over-all strength and the forward momentum of our defense, it is entirely possible that in the years ahead we could fall behind. I repeat: we could fall behind -- unless we now face up to certain pressing requirements and set out to meet them at once.

I address myself to this problem knowing that for every American it surmounts any division among us of whatever kind. It reminds us once again that we are not partisans of any kind, we are Americans! We will close ranks as Americans, and get on with the job to be done.

According to my scientific friends, one of our greatest, and most glaring, deficiencies is the failure of us in this country to give high enough priority to scientific education and to the place of science in our national life.

Of course, these scientists properly assume that we shall continue to acquire the most modern weapons in adequate numbers as fast as they are produced; but their conviction does expose one great future danger that no amount of money or resources currently devoted to it can meet. Education requires time, incentive and skilled teachers.

They believe that a second critical need is that of giving higher priority, both public and private, to basic research.

As to these long range requirements, I shall have something to say next week.

Tonight I shall discuss two other factors, on which prompt action is possible.

The first is the tragic failure to secure the great benefits that would flow from mutual sharing of appropriate scientific information and effort among friendly countries.

Most great scientific advances of the world have been the product of free international exchange of ideas. There is hardly a nation that has not made some significant contribution to modern science.

There instantly comes to mind the contribution of Britain to jet propulsion, radar, and infra-red rays; Germany to rocketry, x-rays, and sulfa drugs; Italy to wireless telegraphy; France to radio activity; and Japan to magnetism.

In the free world, we all have a lot to give and a lot to gain in security through the pooling of scientific effort. Why should we deny to our friends information that we are sure the Soviets already have? -- information our friends could use toward our mutual security.

Why, for want of the fullest practicable sharing, should we waste American research funds and talent struggling with technological problems already mastered by our friends?



Here is a way in which, at no cost, we can dramatically and quickly magnify the scientific resources at the disposal of the free world.

The second immediate requirement is that of greater concentration of effort and improved arrangements within the government in the fields of science, technology and missiles -- including the continuing requirement for the closest kind of Executive-Legislative cooperation.

### III.

As to action: I report the following items to you tonight.

The first thing I have done is to make sure that the very best thought and advice that the scientific community can supply, heretofore provided to me on an informal basis, is now fully organized and formalized so that no gap can occur. The purpose is to make it possible for me, personally, whenever there appears to be any unnecessary delay in our development system, to act promptly and decisively.

To that end, I have created the office of Special Assistant to the President for Science and Technology. This man, who will be aided by a staff of scientists and a strong Advisory Group of outstanding experts reporting to him and to me, will have the active responsibility of helping me follow through on the program that I am partially outlining tonight and next week.

I am glad to be able to tell you that this position has been accepted by Dr. James R. Killian, President of the Massachusetts Institute of Technology. He is a man who enjoys my confidence, and the confidence of his colleagues in the scientific and engineering world, and in the government.

Through him, I intend to be assured that the entire program is carried forward in closely-integrated fashion, and that such things as alleged inter-service competition or insufficient use of overtime shall not be allowed to create even the suspicion of harm to our scientific and development program. Moreover, Dr. Killian will see to it that those projects which experts judge have the highest potential shall advance with the utmost possible speed. He will make sure that our best talent and the full necessary resources are applied on certain high-priority top-secret items that, for security reasons, I know you will not expect me to enumerate.

In looking to Dr. Killian to discharge these responsibilities, I expect him to draw upon the full abilities of the scientists and engineers of our country.

Second: In the Defense Department is an official, directly responsible to the Secretary, in charge of missile development. I have directed that the Secretary make certain that the Guided Missile Director is clothed with all the authority that the Secretary himself possesses in this field, so that no administrative or inter-service block can occur. Dr. Killian will, of course, work intimately with this official.

Third: The Secretary of Defense and I have agreed that any new missile or related program hereafter originated will, whenever practicable, be put under a single manager and administered without regard to the separate services.

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Fourth: There will be laid before the Congress proposed legislation to remove legal barriers to the exchange of appropriate technological information with friendly countries.

Fifth: If the necessary authority is granted, I shall support, along the lines of the agreement reached with Prime Minister Macmillan, a Scientific Committee organized within NATO to carry out an enlarged Atlantic effort in research. Similar action in SEATO and comparable organizations will be studied. And, to help carry out these measures of mutual effort, the Secretary of State will appoint a Science Adviser to himself and Science Attaches in appropriate places abroad.

At any point in any of these actions where additional legal authority proves necessary, that authority will be asked of Congress at the outset of its next session. These matters will be discussed in my forthcoming bipartisan meeting with the leaders of Congress. They will be requested to consider every feasible step to hasten needed legislative action.

These, my friends, are the most immediate steps that are under way in scientific areas as they bear upon security.

Even in two talks I cannot, by any means, cover the entire subject of defense, but only selected questions of pressing and current importance. Accordingly, I am not at this time even alluding to a number of key items bearing strongly on defense, such as mutual aid, and Civil Defense. Likewise I have not dwelt upon the urgent need for greater dispersal in the Strategic Air Command, or for providing all the means that will enable airplanes to take off in the shortest possible time after receipt of warning.

In this whole effort it is important to see that nothing is wasted on non-essentials. Defense today is expensive, and growing more so. We cannot afford waste.

It misses the whole point to say that we must now increase our expenditures of all kinds on military hardware and defense -- as, for example, to heed demands recently made that we restore all personnel cuts made in the armed forces.

Certainly, we need to feel a high sense of urgency. But this does not mean that we should mount our charger and try to ride off in all directions at once.

We must clearly identify the exact and critical needs that have to be met. We must then apply our resources at that point as fully as the need demands. This means selectivity in national expenditures of all kinds. We cannot, on an unlimited scale, have both what we must have and what we would like to have.

We can have both a sound defense, and the sound economy on which it rests -- if we set our priorities and stick to them and if each of us is ready to carry his own share of the burden.



In conclusion: Although for tonight's purposes I stress the influence of science on defense, I am not forgetting that there is much more to science than its function in strengthening our defense, and much more to our defense than the part played by science. The peaceful contributions of science -- to healing, to enriching life, to freeing the spirit -- these are the most important products of the conquest of nature's secrets. And the spiritual powers of a nation -- its underlying religious faith, its self-reliance, its capacity for intelligent sacrifice -- these are the most important stones in any defense structure.

Above all, let me say for all to hear that, so far as we are concerned, the amassing of military might never has been -- and never will be -- devoted to any other end than defense and the preservation of a just peace.

What the world needs today even more than a giant leap into outer space, is a giant step toward peace. Time and again we have demonstrated our eagerness to take such a step. As a start in this direction, I urge the Soviets now to align themselves with the practical and workable disarmament proposals, approved yesterday by a large majority in the United Nations.

Never shall we cease to hope and work for the coming of the day when enduring peace will take these military burdens from the back of mankind, and when the scientist can give his full attention, not to human destruction, but to human happiness and fulfillment.

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