The Heritage Lectures 38

Assessing Strategic Defense

Six Roundtable Discussions

Edited by
W. Bruce Weinrod

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Introduction

On March 23, 1983, Ronald Reagan urged that the U.S. begin investigating the possibilities for defending itself against nuclear attack. He then sketched what is now known as his Strategic Defense Initiative—or SDI. The Reagan speech could become a milestone in the evolution of how the U.S. confronts the dangers of the nuclear age. For one thing, SDI marks an effort to move away from the strategic primacy played by offense since the development of atomic weapons. For another, SDI signals a frontal assault on the concept, long accepted in the U.S., that deterrence can be assured only by leaving civilian populations totally vulnerable to nuclear destruction (a concept which, in any event, the Soviets never fully accepted). Further, SDI is stimulating a fundamental questioning and rethinking of the nuclear doctrines developed in the 1950s and 1960s.

Not surprisingly, proposing a fundamental shift in the U.S. nuclear policy raises questions. Critics of SDI, often rushing to judgment, predictably have offered numerous objections. Yet even sympathetic observers have raised important issues. In response to the intense public interest and discussion, The Heritage Foundation hosted a series of discussions in May 1984 on the key issues involved in strategic defense. While many of these issues are interrelated and actually interact with each other, the review of SDI was separated into six distinct areas for purposes of discussion:

I. *Technologies of strategic defense:* The threshold question surrounding strategic defense is whether it can work and, if so, which technologies would be most effective. In this session, experts summarized the technical aspects of the major SDI technologies, the time required for development, and each technology's particular advantages. The panelists agreed not only that several technology options are very promising but that potential Soviet countermeasures would not undermine the system. SDI, for example, could overcome many possible countermeasures, while deployment of other countermeasures would require the Soviets to reduce significantly the nuclear capabilities of their powerful heavy land-based ICBMs. The panelists also agreed that the cost to the U.S. of adding new defensive measures probably would be substantially less than the cost to the Soviets of adding the offensive weapons necessary to overwhelm U.S. defenses. As such, the panelists felt that SDI research and development

should be placed on a fast track with a specific deadline required for a report to the President on which technology or group of technologies should be approved for actual development.

II. *Soviet response to SDI:* Perhaps the most fundamental point made by this panel was that the Soviets already are involved heavily in developing strategic defenses. Any Soviet "response," therefore, would be merely a continuation of present policies. Nonetheless, the prospect or actual deployment of a U.S. strategic defense system would be a major development and the panelists assessed how Moscow might react. Among the possible responses, the Soviets might: continue to take actions which violate the spirit if not the letter of the ABM Treaty, seek to force the U.S. to withdraw from the Treaty first, thereby reaping a propaganda advantage by blaming the U.S. for "undermining arms control," develop countermeasures for the SDI, or seek to cause a unilateral U.S. halt in its SDI program through a propaganda offensive for the "demilitarization" of space.

III. *Transition from offense to defense:* Several important questions arise when contemplating a U.S. move toward SDI—how to get from here to there; what will happen to the U.S. need for offensive strategic nuclear weapons; and what, if any, are the implications for strategic stability during a transition to strategic defense? The panelists agreed that a transition to strategic defense need not be destabilizing. Indeed, if managed correctly, it could create a more stable U.S.-USSR nuclear relationship since retaliatory (or second-strike) weapons at least would be protected, which would lessen the temptation for a Soviet first strike. In any event, the panelists suggested that even with a strategic defense system, the U.S. would also need to retain a reduced, but substantial, offensive capability and also develop its civil defense network.

IV. *Implications for arms reduction:* The discussions by this panel demonstrated that the relationship between the SDI and the arms control offers great opportunity for creative thinking and for rethinking the existing approaches to arms reduction. The panelists agreed that the U.S. should be willing to consider whether the goals of arms control might be met not by treaties in the SALT mold, but through a shift from an offense-dominant to a defense-dominant strategic environment, or by methods other than formal agreements. Even without formal agreements, SDI could achieve at least some traditional arms control objectives, such as strategic stability, lower damage capabilities of nuclear arsenals, and reduced damage should conflict occur. At the same time, SDI could

make an arms reduction agreement more acceptable by minimizing the damage of a surprise attack from concealed nuclear weapons.

V. *SDI and the Pacific Basin:* U.S. strategic thinking has focused almost exclusively on the European theatre. Yet, the U.S. has large and growing security, political and economic interests in the Pacific Basin. The day is past when the Pacific can be ignored when evaluating any significant proposed new U.S. strategic initiative. The Heritage panel on the implications of SDI for the Pacific Basin was the first sustained public consideration of this matter. Among the most important points made were: 1) strategic defense could help protect Japan and Korea; particularly with its sensitivity toward nuclear weapons, Japan might be receptive to strategic defense, which could also make it less susceptible to Soviet nuclear blackmail; 2) the U.S. maritime position in the Pacific could benefit from naval strategic defenses, especially against Soviet cruise missiles; SDI could also protect critical U.S. naval and air force installations in the region and 3) Asian technical capabilities and financial resources could help the U.S. develop strategic defense. It was agreed that the Pacific Basin nations generally have an open mind on SDI and could become active participants in the effort.

VI. *SDI And NATO:* NATO remains the most important defense and security commitment of the U.S. Indeed, the U.S. extended deterrence nuclear strategy was developed primarily as a way of deterring a massive Soviet conventional attack on Western Europe or defending against such an assault. Any U.S. effort to change the nature or the doctrinal support for current NATO defense policies would therefore arouse considerable interest in Europe. Initial Western European reaction not surprisingly ranged from skeptical to hostile. In recent months, however, there are mounting signs that many Europeans are willing to consider SDI with an open mind; some European groups, such as London's Institute for European Defence and Strategic Studies (IEDSS) have been sympathetic to SDI.

Concern was expressed on the panel that SDI could divert resources from efforts to strengthen NATO's conventional capabilities. It was also suggested that SDI might spark political controversy, similar to that accompanying the 1983 deployment of the intermediate range missiles. In response to this, other panelists pointed out that the credibility of the U.S. pledge to defend Western Europe, now in doubt, could be bolstered by SDI, since the U.S. no longer would be as vulnerable to a Soviet first strike, nor would the U.S. be open to Soviet nuclear blackmail after a surgical first strike had decimated its nuclear retaliatory capability.

Some panelists contended that it is technically feasible to develop defenses for Western Europe as well as the U.S., thereby providing more direct protection for Europe, and protecting important conventional NATO capabilities now subject to destruction by a Soviet first strike. Finally, the technological advances associated with SDI might prove attractive to West Europeans seeking ways to modernize their economies and become competitive internationally.

CONCLUSION

While many differences of opinion were expressed by the panelists, there was general agreement that the development of a strategic defense system is technically possible and that short-term partial systems could be deployed within about five years. More comprehensive systems could be developed within a decade or so. On policy-related issues, such as strategic stability, arms control, and the implications for U.S. allies, there was general agreement that none of the concerns raised thus far is sufficiently serious to warrant abandoning SDI efforts.

More important, there is sufficient possibility that SDI might help protect the U.S. and its allies, help pressure international strategic stability, and further the objectives of arms reduction, that the allocation of very substantial resources to the program is justified. The Heritage Foundation hopes that the readers will find the discussions which follow to be of use in evaluating the problems and prospects of strategic defense.

W. Bruce Weinrod
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Panel 1

The Technology of Strategic Defense

Panelists:
Angelo Codevilla, Senate Select Committee on Intelligence
Fred Redding, DCS Corporation
Lowell Wood, Lawrence Livermore Laboratory
John Rather, DESE Research and Engineering, Inc.

April 27, 1984
The Louis Lehrman Auditorium
The Heritage Foundation

Bruce Weinrod: The Heritage Foundation has initiated a Strategic Defense Project which includes a series of publications, working groups and discussions such as the one we are sponsoring today. On the following two Fridays, there will be expert panels discussing crucial policy implications relating to strategic defense. These include the implications of strategic defense for arms control policy, the problems and prospects of a transition from offense to defense, and the implications of strategic defense for Western Europe and the Pacific Basin.

Because of the interactive nature of many of these issues, there will inevitably be some overlap between the panels. Nonetheless, we think it will be useful to have the same issues addressed from different perspectives.

Today, we want to begin at the beginning. The most fundamental question relating to strategic defense obviously is the technological one. Is the technology already available, or can technology be developed to construct a system which would protect against incoming nuclear missiles? We know that there may not yet be conclusive answers to some of these questions, but we want to raise them and go into as much depth as we can.

As many of you know, this basic question raises a whole host of subsidiary but equally important questions. How effective could any such system be? How effective need it be in order to justify the costs? What can or should it protect? What would the costs be? How soon could such a system be available? If a combination of systems is necessary, which is the best combination? Is the same or a similar technology also effective against submarine-launched missiles? What are the vulnerabilities of the technology? What countermeasures could be devised, and what would be the cost ratio between offense and defense in such a situation? Also, what is the specific theory behind the technology? Is it to directly provide a nearly impermeable shield to the civilian population; or to protect vulnerable retaliatory forces; or to deter by uncertainty, thereby indirectly protecting populations; or perhaps some combination of these or other purposes? Finally, can protection be extended to our allies?

One's conclusions on these questions will have a major impact upon one's policy perspectives regarding strategic defense. It is the premise of the Heritage Foundation that strategic defense is not, as one critic recently put it, "a strange interlude that is evanescent and will quickly fade," but rather expresses a fundamental moral and practical impulse with respect to strategic nuclear arms doctrine and systems in the contemporary world. If there is possibly a way to strengthen deterrence and either minimize or substantially eliminate societal destruction should

a conflict between nuclear powers break out, then it seems not only appropriate, but obligatory, to allocate the resources necessary to find out whether such a system will work and to implement it if it does.

At the same time, it is clear that difficult technical and policy issues are raised by strategic defense. It is to further public discussion on these issues that we are pleased to begin our Strategic Defense Panel Series with individuals knowledgeable about the most significant technologies that are being considered to implement a strategic defense system. I know there are many in the audience who are already familiar with at least some of the issues to be addressed today. However, I have asked our panelists to assume only the most basic level of knowledge or expertise in order that all can follow the presentations. I have also asked the panelists to be as brief as possible in their opening remarks. This will, of course, make it impossible for them to be as thorough as I am sure they would like to be, but we want to allocate as much time as possible for questions and discussion. Finally, I have asked the panelists to focus only upon the most crucial aspects of their technology. Clearly, many related support systems—some of them crucial, such as sensors and battle management systems—will be necessary, and to the extent that they are very relevant they will be addressed. However, the primary focus will be on the most essential elements of the systems.

Our first speaker will be Dr. Angelo Codevilla.

Dr. Codevilla: Thank you. In 1979, Senator Malcolm Wallop, for whom I work, and I became acutely conscious of the fact that the Soviet Union had, for all intents and purposes, won the race for supremacy in strategic ballistic missiles. Hence we looked for a way of undoing that victory. We quickly saw the very great difficulties that we would face in attempting to build more missiles than the Soviets had, and began to look for means of negating the Soviet Union's obviously great capacity to rain counterforce warheads upon us.

The field of anti-ballistic missile defense had been largely neglected in the United States since the signing of the Anti-Ballistic Missile (ABM) Treaty in 1972, although not at all neglected in the Soviet Union. We saw that advances in data processing had made the revival of ground-based ballistic missile defenses profitable, and we urged such a revival. Indeed, we worked very hard to put extra money in there. But we also noticed that some new developments had taken place in the field of directed energy weapons, and set about increasing the funds available to those initiatives and publicizing them.

I want to say at the outset that although much of our work has focused on infrared chemical lasers, from the very beginning we have sought to

increase funding for all directed energy weapons; indeed, for all anti-missile weapons. Our purpose is not to simply further the fortunes of chemical lasers, but to further the fortunes of ballistic missile defense in the United States. That is because we believe we have no decent alternative to ballistic missile defense. We want it any way we can get it, and as soon as possible.

Now, I believe that I am the only person here who, in his efforts to increase the prospects of ballistic defense, has not sought to diminish the prospects of any system involved in ballistic missile defense. So the fact that I am speaking on behalf of chemical lasers should not be taken as opposition to the building of anything else. Indeed, Senator Wallop's position and my own is that all technologies in this field ought to be brought along as quickly as possible. In the case of chemical lasers, as I hope to show, that means systems integration as quickly as possible. That means right now.

What is a chemical laser? A chemical laser is, first of all, a chamber within which various chemicals, in this case, hydrogen and fluorine, are mixed. As the chemicals mix, they form a compound (hydrogen fluoride) in a highly excited state. That is to say, the compound holds together, but only slightly. The outer electron orbit of the hydrogen fluoride molecules is stretched to the limit. These highly energized molecules exit this chamber through nozzles into an area of very low pressure. Because of the very low pressure, they exit very quickly. Indeed, the faster the exit, the better; the lower the pressure on the outside of this chamber, the better. Space offers the ideal environment for this reaction because, of course, in space the perfect vacuum environment is to be had for free. As these molecules exit the chamber, the level of energy in them drops simply because of a drastic lessening of pressure. The outer electron orbit contracts, much as a rubber band contracts when pressure upon it is released, and a bit of energy is released. That energy is always released at a wavelength of 2.7 microns. This reaction, of course is repeated billions of times because of the number of molecules involved. The light is caught between two concave mirrors, one of which has a hole in it, allowing the beam to be drawn off. The beam is then drawn off, shaped, and used. In a moment I will talk about how that is done.

The power of a chemical laser depends entirely on the number of such molecules undergoing this reaction. This means that it can be increased rather readily by increasing either the number of nozzles, or the throughput of fuel. Much work is being done on making the process more efficient. But by strictly brute force means, the power of chemical lasers can be increased at will. In 1979, we found that the Defense Advanced

Research Projects Agency (DARPA) had a program called "Alpha" underway which aimed to build a 5 million watt chemical laser. By 1980, the Rocketdyne and TRW companies had taken this basic 5 megawatt design and, by improving the efficiency of the nozzles, had turned it into a 10 megawatt design which was and is in the process of being built section by section. If you want a more powerful chemical laser, you simply lengthen the bank of nozzles.

We were impressed with the prospects for using this by a series of experiments which the Army commissioned to determine the hardness, i.e., the level of resistance, of ballistic missiles to laser weapons. These tests showed that aluminum cylinders which simulated missiles in their thickness, in their design, and in the pressures and temperatures to which they would be subjected under boost phase, would blow up having received as little as 80 joules per square centimeter of long-wave laser power. This is very little. A joule is a watt-per-second. Eighty joules per square centimeter is really a very low amount of energy. As recently as last year, a Thor missile with its engines burning was destroyed by placing that amount of energy upon it.

Given the power of a 10 megawatt laser focused by a main beam director of 10 meters wide, such a missile could be destroyed in much less than a second at distances well over 3,000 kilometers. Solid fuel missiles, being built not of aluminum but of composite materials, are considerably harder, considerably more resistant. Tests by the Air Force Weapons Lab which were made public well over two years ago, show that about 800 to 1,000 joules per square centimeter are required. Again, this is very much within the range of a chemical laser at 3,000 kilometers. At 3,000 kilometers, the 10 megawatt design that I spoke of would put approximately 700 watts per second per square centimeter on a target. This would require slightly over a second to destroy that target.

Now then, we also noticed that the pointing and tracking system that such a laser requires (and that, indeed, would serve almost any other directed energy weapon), was in the process of being built. This is the "Talon Gold" program. This involves two telescopes: the first one features an infrared focal plane upon which the images of targets (missiles in this case) would be registered. The entire assembly would be moved so as to shift the desired images to the center. At this point, the other telescope would take over. This is a small active laser-ranging telescope. The small laser would hit the target and return to focal plane allowing a lock-on to take place. Movement of the main beam direction would be synchronized.

The Lode Program, which was also ongoing at the time, and still is, although somewhat reduced in scope, would have, and in fact does now

permit, the fabrication of the segments for the 10 meter mirror that would be required for this weapon. There are several companies involved, but perhaps the main one, Eastman Kodak, believes that it could turn out these large mirrors, with the proper amount of money, within a couple of years. They believe that this is not a technological problem, but rather a problem of production.

Senator Wallop and I saw that these three programs, Alpha, Talon Gold and Lode, could be combined, and sought to have this happen. Senator Wallop succeeded in passing an amendment to establish within the Air Force a program office to get all of this done. He urged President Reagan to commit himself to strategic defense on the basis of the availability of these and other technologies. We are delighted that the President has done this. We are not so delighted that the Fletcher panel recommended the building of no anti-missile system whatsoever, but rather the long-term research into systems which may or may not shoot down ballistic missiles at some future date. We know that ballistic missiles can be shot down by chemical lasers and that the prospect of hardening ballistic missiles to resist the power the chemical lasers can put out is, to put it mildly, unproven and, I might add, advanced by some in a not totally sincere manner. We believe ours is a valid initiative.

Are there countermeasures to destroying ballistic missiles in this way? Well, of course, there are always countermeasures to everything. But we most certainly decry the attempt to posit, by fiat of the mind, perfect countermeasures which always work to defeat real attempts to defend ourselves. A chemical laser is thoroughly capable of destroying any missile sent up against it at the short ranges at which the defense of such a chemical laser would occur. The chemical laser is capable of putting as much effective flux upon the target as any other kind of laser. There is a handsome curve on this published in the 1982 issue of *The Journal of Defense Research* which I commend to all who have clearances.

It is entirely possible, of couse, to irradiate such a laser battle station by a more powerful laser from farther away, just as it is possible for one tank with a longer-range gun to destroy a tank with a shorter-range gun. But it is also possible to armor these lasers in very interesting ways. A study done by the Lockheed Corporation, I believe, was aimed at enabling a satellite to withstand a one megaton nuclear explosion within 10 miles. This is an ambitious goal but it is one that can be met.

A variety of subsidiary technologies for the chemical laser battle station exist already, for example, the one which isolates the vibration of the laser from the very great stillness that is required for pointing and aiming at long distances. The mirror technology that is necessary for

aiming is very much in hand and in use every day. This is one of several sets of technologies that is available to the country right now, and Senator Wallop will make sure, I am told, that it is going to be part of any strategic defense initiative that is actually approved. There is some doubt as to whether any will be approved, but if it is approved, it will be approved with something that is capable of defending the American people in this century and indeed, at the very end of this decade. Thank you.

Mr. Weinrod: Continuing our discussion is Mr. Fred Redding.

Mr. Redding: First, let me say that my profession is generating advanced concepts, and so it's not normally my style to appear in public in an issue discussion. However, I felt duty bound to represent one end of the spectrum of technology—this being a technology panel. The other considerations of ballistic missile defense will be discussed anyhow in other panels.

When the President gave his speech on March 23, 1983, it was not a result of a change in threat, nor a result of a perception of a change of threat. It was, however, a change in strategy by the Commander-in-Chief of the armed forces and President of the United States. So I began to look at the problem anew from the point of view of what can be done with existing, or consolidated, or at least near-term technology. (In advanced concepts, it is not required that we use very advanced technologies.) My conclusion is that I am not terribly impressed with the difficulty of the problem in terms of being able to shoot down ICBMs, SLBMs, and so forth. I am impressed, however, with the problem of survivability and of the limited capability of the United States with respect to national resources (principally money). So I am not by any means trying to suggest that there is an easy, quick solution. I am saying, however, that as far as I can tell the Fletcher Committee, for example, did not address the near-term solution to the current threat.

When I read and re-read the President's speech and directives, it is not clear as to whether he intended that we solve the problem now or whether he had been advised that it is not possible to solve the problem now. I would surely like to hear from those on the inside as to what he believes, because it is he who is our President.

I believe there should be a truly objective technical response and that it should include near-term technology. I am not in any way critical of the mid-to-far-term higher technology efforts. I applaud them because I believe that the President is 100 percent correct. However, there is a real threat there and we should address it as soon as possible. So please do not interpret anything I say as being in any way negative with respect to the directed-energy ways of doing things on this issue. But I also believe we

should find out what the current and near-term technologies will provide. I charge Congress to ask those questions and expect proponents of the technologies to speak to the issues.

I would like to suggest, from a conceptualist's point of view, that we should do system concepts research not just on the technology but on the whole system put together. When I was asked by the High Frontier group (actually it was before the High Frontier was organized) for my judgments as to whether a near-term ballistic missile defense is feasible, my first reaction was negative. But upon thinking and talking with others, my answer was "Yes, I think it's feasible." What we presented in the High Frontier document[1] was simply a road map, expressed in terms that the non-technical person can understand to get a better grasp of the whole situation. For example, I presented a block diagram of a generic total system. Each of those blocks needs to be developed conceptually. We could give a briefing on each of the blocks. Yet I do not see block diagrams. I do not see discussions of total systems. I think we are preoccupied with high technology, and that we should consider the near term and do it with a total-system-concept point of view. Any effort in this direction will help us to understand better the comprehensive system problem that will sooner or later have to be faced by the high technology systems anyhow. Such a system as I am talking about may also be the underlay to help protect the later, higher technology systems that would probably be in high orbit.

I believe we should do the systems conceptual research, generate and analyze the whole systems, evaluate them fully and objectively, then selectively demonstrate their operation. For example, the systems I have in mind could probably be demonstrated within two years even if we used the Orbiter[2] and fired out of the Orbiter against re-entry vehicles deployed out of Vandenberg. Now that may give a headache to NASA, but I am talking of the national interest. I believe we should use any asset we can to make an early and, it is hoped, low-cost demonstration. Then, if necessary, we can postpone the production and deployment, if postponement is in the national interest, but be prepared to go if we must. Also, I believe everything I am proposing is synergistic, complementary to the high technology concepts.

I am going to give you a couple of examples of the kind of technologies I am talking about. I just wish we had more time, but I wanted to go on

[1]High Frontier, established in 1981, is a private non-profit organization based in Washington, D.C. The objective of the High Frontier Study was to formulate a national defensive strategy option maximizing the use of U.S. space technology.

[2]The Orbiter is one of the U.S. space shuttles.

record to say that yes, I believe that it may be feasible. And, that I do not believe we are giving it proper attention. But I do not want to beg the question, so I will give you some technologies to consider.

Let me just give you a brief example. I mentioned the Global Ballistic Missile Defense (GBMD) system which was in the High Frontier proposal in a few pages. The document which I submitted was about 30 pages. So probably none of you here have seen much of the GMBD. It was a road map. I have continued to work on that road map to improve it.

The first improvement was of sufficient nature so that we renamed the system. I call this system the Global Defense Against Ballistic Missiles (or GDABM). The key feature added is a special kind of gun—a gun for which the technology has been available and has been demonstrated for well over 20 years. The gun is put on each satellite and we have proliferated the satellites. Let us assume about 1,700 satellites. Now that may impress you as being a large number. But I will remind you that it is a matter of writing a check, not a technology problem. The launch vehicle for these satellites is the MX booster. Throw away the warheads. Throw away the post-boost vehicle.[3] But this GDABM self-propelled satellite is on top and that is how we get it into orbit. We are not talking about or requiring or paying for a new development program for launch vehicles.

Once in orbit (I am just giving parts of it), there is the gun. The gun is a Gatling[4] kind of gun, but very different from what you have seen before. It can fire, in the configuration for which there are preliminary design drawings, a million pellets in one second with a muzzle velocity of 4,000 feet per second. A cloud is formed that is 4,000 feet long and up to hundreds of feet in diameter when the cloud is near the target. The clouds are deployed against deployed reentry vehicles. In other words, any reentry vehicle that has been deployed will have to pass through a cloud, not only over Eurasia but also over North America. That is, those reentry vehicles that go up must come back down and, with our global network of satellites, they will come back down where we will have another shot at them. Thus this is a two-tier system for the one price of a single tier. The gun we use as a representative gun has 10 shots—each shot produces one cloud of one million particles.

In addition, because the cloud gun is not effective against a jinking (that is, bouncing and sinking), accelerating vehicle such as a post-boost vehicle (bus) or a final stage, in this particular GDABM concept configuration we also use a homing vehicle system. The homing vehicle

[3]The part of a missile that carries warheads and their controlling devices which remains after the rocket boosters have separated from it.

[4]An early machine gun with a cluster of rotating barrels.

would go down and intercept the post-boost vehicle or the final stage. Because we have proliferated the low-altitude satellites, we need a very reduced number of such homing vehicles per satellite.

Let me emphasize the proliferation. Once I understood the value of proliferation, I found it changes the whole ball game. There are always satellites around, so the ranges to and from the threat are much less. With this much shorter range than with most other systems, much stronger signals are received, thus, a much less sensitive sensor is required. There are a lot of benefits in such a system, e.g., survivability; you have got many warriors (satellites) coming over the hill every time they shoot down one of these things. That is the way to go.

The latest version of the GDABM is sufficiently new and different that I call it GDABM-II. We use the cloud-gun against the deployed reentry vehicles and targets of opportunity such as buses, but now add a new technology dimension, which happens to be directed energy, at one end of the application spectrum. We deploy a homing or non-homing vehicle (let us make it non-homing, to keep it inexpensive) down to the target, which is in the post-boost vehicle or the final stage. When the vehicle gets in the vicinity of the target (anything from hundreds to thousands of feet) it goes "Ka-Boom." But it is not a warhead, so there's no debris. Nothing happens except an electromagnetic pulse in the giga-watt[5] power range. By using today's advanced technology in terms of the extremely high energy-rate-release battery (lead-acid is one of them properly designed and demonstrated), with very elementary signal conditioning, and going out through a device which has been demonstrated with a small solid-angle cone of electromagnetic pulse, we're talking way up into the giga-watts. It should wreak havoc with any post-boost vehicle or booster, which has so many miles of wires and solid state components. So this deployed EMP is an additional directed energy technique and several of these devices would sit on your chair. We are not talking about megabucks for these. We are talking in terms of hundreds to thousands of dollars and buying them in large quantities with the associated economies of scale.

I believe that there has been disproportionate attention paid to the long-term high technology solution. The country deserves that near-term solutions also be pursued. Finally, I would say that because the threat problem is so severe, let us do what the President effectively said and leave no stone unturned. Thank you.

Mr. Weinrod: Thank you very much Fred. The next panelist is Dr. Lowell Wood.

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[5]One billion watts.

Dr. Wood: By way of background with respect to discussing the more advanced technologies, I would just like to review for you what has changed since the last time defense against ballistic missile attack was debated in this country, roughly a dozen years ago.

There have been a number of relatively new wrinkles in this area. I will just call four to your attention briefly. The first, of course, is one that perhaps captures the public imagination most readily. It's concerned with directed energy and directed matter "screens" that are potentially the "kill" modality of strategic defense systems. But they are by no means the only technologies which have advanced very substantially in the last dozen years. Most of these directed energy and directed matter technologies are classified. About all that I can say about them generically is that there have been both very large quantitative advances and, in several notable cases, qualitative advances. Systems approaches and technologies that did not even exist a dozen years ago are in existence now. Some of them have advanced a very substantial distance since their inception.

Other technologies are also crucial to the prospect of defense against strategic attack. One is computers. Everybody is familiar with the microchip revolution that occurred in the 1970s. That has had very substantial consequences for the ability to manage engagements that involve not only thousands, but potentially hundreds of thousands of objects in an all-out strategic war situation.

Yet another axis of great importance is that having to do with communications. You are all familiar with the possibility which is being exploited these days in a smashingly successful fashion to use fiber optics—to use light as a means of ordinary (not only voice and video) communication, but of transmitting information in defense systems in a fashion which is not only vastly more cost effective but far more robust than ordinary electrical means of communication.

Yet another technological axis in which advances have been very striking since the last debate about ballistic missile defense is that of sensors. You have all seen or heard about cameras which are flatter than your hand and which record information not on film, but on extremely and impressively advanced semi-conductor devices and store them on magnetic tape. These are just examples, and relatively pedestrian examples at that, of the enormous strides that have been made in the ability to detect systems, objects, targets, and form images of them even though they are at very great distances and very small.

And indeed these four technological axes that I have briefly invited your attention to are just some of the more striking ones along which enormous progress has been made, and which very specifically constitute

enabling technologies, for a variety of strategic defense systems, which simply did not exist a dozen years ago.

In contrast, ballistic missiles themselves, as an outstanding example of strategic offense, have changed relatively little. Ballistic missile technology, of course, has been under development for about 50 years now, since the Germans started the V-2 development in the 1930s under von Braun and his colleagues. It has been under extremely intensive development for more than a third of a century. Technologies that have been developed for that long, particularly when a great deal of effort and resources have been put behind them, tend to have reached or attained, relatively speaking, technological plateaus. They do not have much additional mileage in them, if you will. When you stack an emerging technology against a mature technology, if the case can be made even in principle that the emerging technology can be effective in combat against the mature technology, you are well-advised to place your bets on the emerging technology in the long haul. That, I believe, is one of the fundamental premises for the strategic defense initiative.

One of the major new wrinkles in strategic defense or defense against strategic attack involving nuclear weapons that has occurred in the last dozen years, I would suggest, is the concept of attacking delivery vehicles. You recall that in the ABM debate in the late 1960s and early 1970s the emphasis was on killing reentry vehicles as they penetrated the atmosphere and descended onto their targets over the United States. A major emphasis, and certainly not the exclusive one, of the strategic defense initiative is to attack the delivery vehicles themselves while they are relatively close to the points at which they have been launched. In contrast to the extremely robust reentry vehicles that were the targets of defensive operations a dozen years ago or more, consider the nature of the delivery vehicles—whether they are bombers or ballistic missiles or, for that matter, even cruise missiles—relative to the reentry vehicles which were the alternative targets.

First of all, these delivery vehicles are big, slow, and tagged[6] by their own exhaust streams in an extremely dramatic fashion, as in the case of ballistic missiles. Ballistic missiles have an output power in their exhaust stream which is comparable to that of all the electrical power which is dissipated by the largest cities in existence. These delivery vehicles have no one starting location; that is to say they come from bomber fields, they come from cruise missile launching sites, they come from no one missile silo. They have no one trajectory—that is to say you are not much

[6]Tag: identification of its position by an infrared sensor.

concerned if they are not headed for the United States or allied powers. They are in an uncluttered environment—that is to say there are no hydrogen bombs going off deliberately or accidentally over the attacker's missile fields or over his bomber fields, kind of by assumption. And most importantly, they carry a huge amount of destructive power in them. They not only typically carry multiple weapons, but they carry an enormous amount of material, chaff,[7] decoys, etc., which—if dispersed in the attack environment—pose enormous problems for the defense. It is an extremely higher leverage act to destroy at an early point the attacking ballistic missile itself, which may contain literally dozens of warheads, than it is to attack a single object coming down from space where odds may be greater than 90 percent that it's merely a decoy. And if it happens to be a real object (i.e., a warhead), it was perhaps 3 percent, 4 percent or 5 percent of the payload of the ballistic missile that launched it.

So the ability, the possibility and the exploitation of that capability of attacking delivery vehicles is a very striking change in the current strategic defense initiative, relative to that of the proposals for defense of ballistic missile attack of a dozen years ago.

Moreover, carrying the attack to the homeland of the attacker, or over the homeland of the attacker, fulfills a very important function. It breaks up the attack. An echeloned, massed attack by ballistic missiles is a very, very formidable thing to defend against. If you are trying to conduct the defense over your own homeland, the reentry vehicles are within a few minutes of detonating. The attacker may well choose to detonate, say 3 percent, 10 percent, even 30 percent of them in order to destroy or defeat or neutralize a defense which you are attempting to conduct over your homeland. The standard gambit which is employed in this respect, which is a fearsome one indeed, is of salvage fusing[8] all warheads which are attacked by a defense and then echeloning[9] such warheads. In a circumstance like that, the attacker can literally press a trail of thermonuclear fire all the way on down from 1,000 miles in space onto targets that he's determined to destroy. There is no known defense even in concept against that type of attack. If he succeeds in salvage fusing, if he echelons so that he can ladder down, he can succeed in literally pushing a trail of fire many miles wide and a thousand miles long down on to the targets that he is af-

[7]Radar reflecting wires, or other devices which, when deployed, generate misleading radar readings.

[8]If a salvage fused warhead detects that it is about to be destroyed by enemy defenses it will detonate so as to cause some damage instead of just being neutralized.

[9]Echeloning is the system of firing in sequence so that less damage to offensive forces can result from enemy defense efforts.

ter. Only if an attack is broken up so that echeloning can be defeated can salvage fusing no longer be a guaranteed checkmate against the defense. So the concept of destroying 90, 99 percent, perhaps even more of the attack before it is upon you, before you have minutes to live at most, is an extremely important feature of the strategic defense initiative.

You ask "how in the world is this possible? How, if you are attacked and in the worst case have no warning, if it comes out of the clear blue sky, how do you possibly succeed in breaking it up through attacking enemy delivery vehicles? How do you succeed in making the attack sufficiently unlikely to succeed that it will never be launched?"

There are a number of technologies that are talked about in general at the present time, which unfortunately I cannot do more than allude to and provide a few ranges of numbers. They have been discussed immediately following the President's speech and in the 13 months since. They consist of very high-speed projectiles, of particle beams, and of energy beams. A number of these technologies move at or very close to the speed of light. They go as fast as ever possible. They cover the distances between continents in time scales in the order of a hundredth of a second. This is extremely important because the targets—the bombers, the missiles—themselves are moving at speeds of a tenth of a mile to several miles per second. It is very important, if you do not have the capability to track a very large number of targets over very long distances that are moving very fast, to have weapons that react very rapidly and which, once a target is localized, neutralize it very soon thereafter.

One of the technologies which has been discussed in public, of course, is the possibility of using X-ray lasers to destroy ballistic missiles in space or to destroy post-boost vehicles or to destroy reentry vehicles, or whatever. The concept perhaps of a laser which actually lases X-rays rather than visible light or infrared light, or whatever, is one which potentially seizes the imagination. But in principle, an X-ray laser is no different than any other type of energy beam. The thing which as a practical matter is unusual about X-ray lasers is that they offer the possibility of focusing enormous amounts of energy into relatively very tight beams, so that energy is of potentially destructive magnitude at distances on the order of the size of our planet—very great distances, indeed.

Another thing which is peculiar about them is that they derive their energies from nuclear explosions. Because of that, they potentially have access to extremely large quantities of energy and even larger quantities of power that they can potentially transduce into these beams.

It is important to note that X-ray lasers are intrinsically weapons which are used either in space or at the very upper fringes of the atmosphere. It

is technically incredible on very fundamental physical grounds for X-ray lasers to be used to attack targets on the ground, or even targets in the low atmosphere.

X-ray lasers, therefore, have a peculiarly strong claim, deriving from fundamental physical considerations, to being non-offensive weapons. They cannot be used to hurt people—not by matters of policy or treaty or technology—but by matters which derive immediately from the fundamental laws of nature.

Another feature which is not unique, but is certainly interesting, is that X-ray laser beams potentially kill their targets in a fashion in which a jackhammer shatters cement. That is to say they apply impulses to the targets. They do not heat the targets and cause them to melt or soften or deform like hot wax, but they shatter their targets in a manner which is usually styled, in technical jargon, "impulse kill." They apply shockwaves to their targets and break them into pieces. This potentially is a very robust type of kill. It is very difficult to develop a countermeasure. There is no such thing as a system which is completely immune to countermeasuring, but an X-ray laser beam is potentially very difficult to counter.

The feature which is generic to all laser systems is that they have a great deal of reach. That is to say they put energy in a sufficiently parallel beam that this beam will go a very great distance before it has diverged enough that the intensity of the beam has been reduced to the point where it is no longer effective. X-ray laser beams share that characteristic of all laser beams. As I said, however, they contain very much greater energy and very much greater power than any other type of laser beam, again for very fundamental physical reasons.

But that was just a specific example. There are many different strategic defense technologies, not all of which involve energy beams, not all of which involve particle beams, not all of which involve projectile beams. There are many different ones. The existence of most of them is classified. X-ray lasers are a peculiar unclassified example for whatever reason. It's about the only one that I can cite in an unclassified context, but it is by no means unique.

X-ray lasers potentially offer a cost efficiency in unit terms of ten to a hundred-fold over the offense as we see it at the present time. That is to say, a unit of worth, a dollar or a ruble, invested in defense involving X-ray lasers appears to be about 10 to 100 times more efficient than a unit of worth invested in offense. If you are in a contest where one side is spending on offense and the other side is spending on defense, the offense

can be rapidly bankrupted if it attempts to maintain parity of offensive capability against this type of defense.

I will just summarize by saying that in strategic defense technologies in general, there is a great deal of technology in existence at the present time. The remainder which is needed for systems evaluation, for systems integration, for a reliable forecast of systems cost and systems effectiveness potentially is available on a five-year time scale. These systems obviously not only have to be cost efficient but they have to offer a relatively low rate of failure while under heavy attack by offensive threats. You cannot go up against current threats and talk about being efficient 10 years from now. You cannot talk about effectiveness against like threats because you may be faced with a very heavy attack. You have to be countermeasure resistant because the nature of the threat assuredly will evolve. And if there are defensive capabilities the offense will evolve as rapidly as it possibly can.

Also very important, of course, strategic defense must be stabilizing. It must be stabilizing at high crisis levels as well as low. It is becoming increasingly widely understood that the offense-dominated situation which the U.S. and the USSR have been in for the last quarter century is profoundly unstable. It is exceedingly unstable at high crisis levels. And as Freeman Dyson noted in his *New Yorker* series and in his recent book,[10] the Soviets at high crisis levels are very likely to attack preemptively. The Mutual Assured Destruction (MAD) doctrine,[11] as Dyson pointed out, has never been accepted by the Soviets. If we are proceeding on the basis of one strategic doctrine and the Soviets have a profoundly different one, a contradictory one, we are in very grave difficulties as a people, as a race, as a planet.

Strategic defense, I suggest to you, offers the realistic prospect of being stabilizing, not just at the low crisis levels which we have been in from time to time over the last quarter century, but the high crisis level that I suggest neither one of our nations will survive if we ever see it. It is for that reason I believe that strategic defense must be very seriously considered as quickly as the technological options, the costs, the efficiencies, and so forth are available. They can be available in this decade.

Mr. Weinrod: Thank you very much. The final speaker on our panel is Dr. John Rather, who will discuss particle beams and short-wave lasers.

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[10]Freeman Dyson, *Weapons and Hope* (New York: Harper and Row, 1984).

[11]The reciprocal capability of rivals to inflict unacceptable damage on each other during a nuclear war, even after absorbing a surprise first strike.

Dr. Rather: I am mindful now that we have heard three different technologies discussed so far: chemical lasers, kinetic kill devices, and X-ray lasers. And I have been asked to talk to you about four more of them: basically short-wave length lasers, embracing both eximers and free electron lasers, and particle beam weapons, embracing ground-based charged particle beams and space-based neutral particle beams. Being mindful that this is a non-technical audience, I will leave technical discussion for the question and answer section.

Now, you have heard a lot of organized objections lately to the concept of strategic defense. There are people who tell you that it is impossible.[12] There are people who claim to have the support of 125,000 scientists in the Union of Concerned Scientists. The Office of Technology Assessment came out just the other day with a report telling you why it is impossible. I think, however, that Lowell Wood and I and numerous other physicists and engineers who have spent 25 years working on the germane technologies and scientific topics in the various national laboratories, will stake our reputations on the fact that it is definitely not impossible, it is thoroughly possible, and we can do it soon.

A second thing that you hear a great deal about is the weaponization of space. It is argued that the last thing we should want to do is weaponize space. But space has been weaponized for the past 25 years. That's where the whole problem of strategic offense and defense is focused. The fact that the strategic and tactical missiles are sitting in silos or launchers on the ground or in submarines does not take away from the fact that the medium of their delivery is outer space, and that is how they get to their targets in 10 to 30 minutes.

Space is just as weaponized already as, say, the seas are, with perhaps two-thirds of the submarines in port much of the time. So we are not talking about something new in that sense. What we should be talking about is how to replace weapons of mass destruction, that hold hostage the populations of all of the major civilized areas of the world, with weapons of highly surgical, specific destruction that can kill the means of warhead delivery without hurting people. So we are talking about defending people. And as Lowell Wood has said, this can be done outside the atmosphere if we want to do it by that option.

Now the X-ray laser technology that Lowell has discussed—and incidentally three years ago he won the Lawrence Award (which is one of

[12]Ashton B. Carter, *Directed Energy Missile Defense in Space*. Background Paper, April 1984, Office of Technology Assessment, Washington, D.C. For a critical analysis, see Michael Warner, "Reassessing the Office of Technology Assessment," Heritage Foundation *Institution Analysis* No. 32, November 7, 1984.

our nation's highest scientific prizes) for this work and other contributions in the area of national defense—happens to be a nuclear concept. Therefore this possible approach to strategic defense immediately raises the hackles of many people who view as their mission to put the nuclear genie back into the bottle. But I suggest to you that we need to look again at the question of strategic defense to ask ourselves if, since we are talking about huge hostile energies in the form of nuclear energy released from weapons, it makes a little sense to use huge energies to put the genie back in the bottle? I think it makes sense, and in promulgating some non-nuclear options I do not want to detract in any way from the importance of the X-ray nuclear option. Maybe there is a necessary intermediate step between a nuclear freeze (or unilateral disarmament) and what we have got now, which is no defense whatsoever. I think very few people in the United States realize that we really have no defense whatsoever against instant war.

So it is a matter of great national importance to look again at the question of whether directed nuclear weapons are really so evil, given the totally horrifying offensive nuclear arsenal. Maybe they do provide the shortcut, the escape valve, that we need to defuse this powderkeg that we have been sitting on for so long. Basically, at present, we have put the survival of the world in the hands of the craziest guy around, namely the guy who thinks he can get the drop on the other person. This madman could be a submarine commander or a national leader, but putting our faith in him is mortgaging the future of the world on an unstable situation.

With all of that off my chest, let me come to what I am supposed to be talking about, namely some advanced technology options that might also get us a potent strategic defense in a hurry, utilizing non-nuclear approaches. After working and dealing with this problem for a long time, I concluded about six or eight years ago that these were the approaches that could get us there most quickly by the non-nuclear paths.

First of all, I will discuss short wavelength lasers. Why is short wavelength important? What does it mean? Wavelength means the color of the radiation—red light has a longer wavelength than blue light. You can carry that into the ultraviolet, which is shorter still, or into the infrared, which is longer. Physically what it means is this. Every one of you, as a child, played with a magnifying glass. You know that if you have a small glass and you focus the sun's rays that it will start a fire fairly quickly. If you go to a bigger glass, you set the fire faster. On the other hand, if you could take a glass of fixed size and could somehow make the sun radiate at a shorter wavelength, you would achieve the same thing. You could concentrate more energy in a smaller spot with the same small

glass. So the advantage of short wavelength lasers is that they can concentrate more energy into a smaller spot and therefore achieve a quicker kill. A second advantage is that the same capability means that the range of lethality is much greater; and therefore, by operating at short wavelengths, fewer laser devices can cover a larger volume of space. You need fewer of them, therefore they cost less.

The cost, of course, can be an ultimate driver of anything that we do. Last summer, James Fletcher[13] was asked by the Defense Department to convene a panel to look at all of the options available for strategic defense. Instead of taking a few minutes as we are doing today, the Fletcher panel took all summer and looked at about 50 different approaches. Probably every one of those 50 different technologies could be made to work sometime, if we were willing to spend a trillion dollars and take 30-40 years. Probably every single one of them could be made to work, but our problem is to identify what mix of technologies can be put together soonest and most effectively to produce maximum defense with minimum expense.

Minimizing the weight in orbit is a very obvious way to do this because the cost of space systems is heavily tied to what it takes to get them up there. The short wavelength laser approach has led to a popular concept that has even been endorsed by the President's Science Advisor George Keyworth: simply launching mirrors into orbit and relaying laser beams from ground sites to mirrors in space and then to the target. I strongly believe that this is a very important near-term option that can reduce the weight in orbit by at least a factor of 20. And mind you, since the laser is on the ground, you need not worry about putting fuel in orbit or anything else that is highly energy intensive. You can run the lasers more or less indefinitely. People ask, "What about the ground sites, aren't they vulnerable?" Well the answer is that, if these mirrors are able to defend against missiles coming over the horizon, they can certainly keep out things that are approaching the much closer ground site. The hardness, or degree of survivability, of the ground site comes from this "keep out" ability both around it and around the mirror in space.

Now there are two short wavelength lasers that are available, called excimers and free electron lasers, that would make it possible to put the beam on a modest size mirror in space 2,000 or 3,000 kilometers out. Excimer lasers are an older technology. They have been around since

[13]James Fletcher is Professor of Technology and Energy Resources at the University of Pittsburgh. He led the Defensive Technologies Study, commissioned by President Reagan in 1983 to assess the technology necessary to develop a ballistic missile defense.

about 1970, and they use more or less traditional laser techniques to generate the light beam. The mixture of gases, whatever it happens to be, is excited to a high state by an electric discharge; in the process of dropping back from the excited state to the ground state, light is emitted. They tend to be somewhat cumbersome devices, and they work at the very short end of the spectrum—the blue end—and so they have to cope with a certain amount of atmospheric loss. One consequence of this is that it drives up the required power on the ground. But the excimer is a bird in the hand. It's been proven, it works and we know how to harness it and use it. It can be put together in a way that will lead to prodigious early capabilities and therefore it should be supported.

A second technology that still has something of a dark horse complexion is the so-called "free electron" laser technology. I want to give you a little background on that because I think it is an interesting example of how things even get parochialized a little bit in science and technology. The first lasers that were invented about 23 years ago used ruby rods and solid materials; later on, substances like glass were employed. They had a set of problems associated with them, such as how much heat can be applied before the glass breaks, that established limits on their capabilities. There was a generation of six or eight years of physicists who were devoted entirely to those problems. Then gas lasers were invented. The gas provided a means of carrying away the waste heat, so all of those problems disappeared and were replaced with a new set of problems centered around gas dynamics. People came in from aerodynamics and other branches of engineering and the composition of the scientific support for the high-energy laser program changed dramatically in the late 1960s.

Then the chemical lasers and the excimers came along, and once again there were new physics and new engineering problems associated with this. And so for another five or six years, new blood came into the program and we were charging off in other directions. In 1976, a fourth development came along, the free electron laser. This was from the area of high-energy physics, and none of the other guys had ever heard of any of the basic principles and so the free electron laser was sort of kicking against 15 years of established science and engineering wisdom. It had a little bit of trouble a-borning for that reason. However, thanks to the wisdom of the Pentagon's Defense Advanced Research Projects Agency, it has been supported and has succeeded on a shoestring budget. It has made very impressive progress. We now find ourselves in a situation where essentially all of the key physical issues have been answered and demonstrated. The experiments have been accomplished and proved that the theory was correct.

So we are now in a situation where this technology can be expanded very rapidly. It cures many of the problems that grow out of the other technolgies. It works in high vacuum. It does not have internal disturbances. It has an extremely clean beam. It can be tuned to any wavelength. It uses only electricity as its expendable resource, and therefore it can dispense with a lot of the problems of effluents that are associated with the other technologies. On the ground, it can run on the power lines or whatever power source you can give it. In space it could run off the combustion of hydrogen and oxygen, which NASA knows beautifully how to do. Look at the space shuttle; every time it takes off it uses that technology.

So the free-electron laser is a near-term key to short wavelength. It would really open up the whole field for maximum development in a hurry. I think that we can overtake and surpass the performance of any other kind of laser on a time scale of five or six years if we support a robust program in that area.

Now interestingly enough, the free electron laser program depends upon another technology which is directly related to the other subject that I am supposed to talk about—namely charged particle beam and neutral particle beam weapons—and that is high-energy accelerator technology.

Let me digress briefly and tell you what a charged particle beam weapon is supposed to be. This idea originated at Livermore back in the mid-1950s, and programs have been ongoing there for a quarter of a century. I worked there myself on those programs during the 1960s. This has led to the "state-of-the-art" accelerator technology which yields very energetic electron beams which can be used for weapons purposes. Now the charged beams, the electron beams, are usable only within the atmosphere. So what we are talking about is a near speed of light device that would be based on the ground and would shoot at the warheads coming in. It has the very unique property that it would actually penetrate the warhead and get right into the the middle of the nuclear device, and kill it from the inside out. It deposits a lot of energy in a small space and essentially blows the thing up from the inside out. And there would be no nuclear yield associated with that. In fact, you can show that it cannot salvage fuse. There is no way of getting the nuclear warhead to go off by whatever means. So charged particle beams could be extremely important for defending point locations on the ground.

From that work and from other lines of physical endeavor, people began to think about space-based particle beams. Charged particle beams will not work in space because the like-charges repel, that is, the beam wants to diverge in space. It turns out, though, that there are ways of

generating neutral particles which do not feel each other's electrostatic presence and do not expand. And these would have a very similar kill mechanism. They would also penetrate the target and kill it from the inside out. The neutral particle work has been spearheaded by research groups in Los Alamos National Laboratory, and they have brought the technology to a point where you can easily see how it can be generalized forward to accomplish these results. Different sets of problems pertain to each of these things, but every one of them is workable and can be achieved on a reasonable time scale.

What I am saying in a nutshell is that there are lots of ways of skinning the cat. What we need is a national policy saying that this is what we want to do. Every single major example you can think of—the Manhattan Project, the deployment of the nuclear submarines, the deployment of the ICBMs, the Apollo program—has been accomplished in five to eight years. Every one of them has been done under budget for less than $20 billion. These efforts have put people to work and have opened up many synergestic new technologies. All that has been required in every case is for the country to decide first of all what it wants, when it wants it, and then to get congressional support to put up the money to get there. Having those ingredients, turning loose the scientific and aerospace communities, we have always gotten what we have wanted, we have gotten it on time, and it has worked. Thank you.

Mr. Weinrod: I hope this discussion will contribute in small part to helping the country decide what it does want in this area. Before opening the floor to questions, I would like to give the panelists time to comment on what has been said here today.

Dr. Codevilla: Let me address two issues. Wavelength is important, all other things being equal. All other things being equal, you would rather have your knife sharp than dull. True, shorter wavelength penetrates better than a longer wavelength and is therefore preferable.

However, all other things are not equal. First of all, to handle a sharp knife, one needs a better set of gloves than to handle a duller one. In order to handle the so-called short wavelength lasers, one would have to use far better mirrors than we now have. The case of the free electron lasers is illustrative. Here is a fine candidate for short wavelength work which we hope will soon be put into operation, but which, unfortunately up until now, has been only been tested at 10.6 microns—the largest of practical laser wavelengths. Why? Of course the free electron laser could easily be tuned to a shorter wavelength. The problem is getting a mirror to handle it. We hope we will soon get one, but we do not have one now. So this great short wavelength laser will continue to be used at long wavelengths. Some

wavelengths are so short, the X-rays for example, that you can't handle them optically at all; you must rely on other means to narrow the beam. I must emphasize that the discussion of those other means is not so much limited by classification as it is by the relative paucity. One hopes that those means will grow, and that the beams for those X-ray lasers will be narrowed for long-range work because, indeed, they have plenty of power to spare.

As regards countermeasures, you know, this has been a large, growing, and not so terribly honest industry. There are people in this town who live by the so-called red team. That is to say, they spend their energies proving that almost anything around can be countermeasured. Well, they are many. Moreover, their work is almost entirely *a priori*. It is driven by the passion to say, regardless of the data, that any given device, whatever it might be, that we deploy against Soviet ballistic missiles, though it would be effective against current missiles, would be totally countered by the next generation of missiles. That sort of *a priori* statement cannot be countered with evidence because it is not based on evidence. Nevertheless, I submit to you that even if we were to deploy a defense that would protect us only against the current generation of offensive threats, but not against the next generation, we would have done a very great service to mankind. We would thereby have negated the efforts of a whole generation of Soviet citizens who have been impoverished, and driven to achieve superiority in ballistic missiles over the United States. We would then start *even* in the race for supermissiles, for countermeasured missiles. I submit to you that this is not a trivial goal to achieve. Indeed, any system we deploy, now or later will have to defend against those SS-18s, -19s, -17s, plus the -24s, and -25s that are coming along. Why not defend ourselves against them now, since we can do so?

As for these countermeasures, I really must ask anyone who thinks that these things are done easily to simply demonstrate it. Take the MX for example. It is not yet an operational missile. If it is so easy to harden missiles, as the Fletcher panel suggests, why don't these partisans of hard missiles make the MX able to resist 100,000 joules per square centimeter? When they do that, I will take off my hat to them. Until then, I will remain profoundly skeptical.

I most heartily subscribe to the things which have been said here as regards strategy. I believe that the only prudent means by which a nation enters a new field is multiple means. We must go into a new field, conscious of the fact that we do not know how the best creatures of our mind will work. We ought to build what we can, and try out all that we build. I am sure that, as in the case of airplanes, we will not wind up with a

single product. We will not wind up with a single shield anymore than we have ever wound up with a single sword, but rather that we will choose a prudent mix. Thank you.

Mr. Redding: I would just like to add one point with respect to having a large network of satellites at, say, approximately 300 nautical miles, which is a part of the kinds of things that I am talking about. Such a system can operate as a host system that, perhaps uniquely, can pay for this system. Those satellites can be used for solving C^3I problems. It is a point to point line of site around the world. It can be used for relative navigation such as the global positioning system.[14] It could be used internationally. We could help other countries with their problems using that network of communication. And furthermore, in solving its own problem, it's a distributed network where each satellite is not a complete thing all on its own, but rather is part of a distributed system, which means you don't have to have all the complexity on each one.

Dr. Wood: I would like to plead for a course that I believe will serve the nation and the free world very well in the next several years, namely looking at all the strategic defense technologies that could possibly be argued to be appropriate on a side-by-side basis, on equal footing at comparable levels of development, and this should be done as soon as possible. I say this not in self-interest, because X-ray lasers are of a comparably advanced stage of development, as are space-based chemical lasers. These two are perhaps the leading technologies as far as possibilities for near-term deployment. But I suggest that the best technologies in the long haul may be ones that are either relatively very early in development at the present time, or perhaps completely unheard of, or now exist only in the minds of a few people looking at them in a tentative fashion.

So I would suggest that what we want to do is configure this strategic defense technology program so that we get answers with respect to all of the technologies that might be feasible, might be efficient, and might be cost effective, as soon as possible, by all means at the end of this decade. Then we should choose as many of the best of these as can be afforded for subsequent development and evaluation. I think that there may be a number of tactical surprises both pleasant and unpleasant with respect to what might be possible in the way of the technical basis of strategic defense.

I would also suggest something that has been discussed very little thus

[14]Global Positioning System: A large network of satellites or "trucks" distributed in circular orbits of about 300 nautical miles. The point is to negate as many reentry vehicles as possible.

far today, namely, that there might be very substantial contributions along the lines of tactical developments and tactical capabilities from our allies. I specifically refer to the high technology powers in Western Europe and in the Orient. These people should not only be permitted to join us, but should be invited and encouraged to join us in these developments. I think this is extremely important.

I would point out to you that it is likely that strategic defense will not be cheap. I would remind you, however, that strategic offense is exceedingly expensive, not just if it is ever employed, but even in the preparations for it. The Administration is asking for $72 billion for strategic arms in this year's defense request. They are all offensive to an exquisitely high degree of approximation. At these rates, not just Reagan rates, but the rates forecasted by the Carter Administration as well, between now and the end of the century the United States will spend $1 trillion—present, current 1984 dollars—on offensive strategic arms. Ask yourself, if you will, what any reasonable fraction of this—a quarter, a third, a half a trillion dollars—might buy in strategic defense instead.

The strategic arms race is not cheap. People who attempt to attack the concept of strategic defense by saying, "Why, it might eventually cost a trillion dollars," are not telling you what strategic offense assuredly will cost if we continue on the course of the last few dozen years.

I would finally suggest that you consider the alternative between a system which fails deadly, as strategic offense assuredly will if it fails, and a system that's fail-safe, as strategic defense might fail if its ever employed. If strategic defense works poorly and there is a very little offense around, very few people will get hurt. If strategic offense is ever employed, if the MAD standoff ever fails, many hundreds of millions of people assuredly will die.

Dr. Rather: One thing that has not been addressed yet and should be is the question of stable versus unstable deployment of these systems. I think that the President and the Secretary of Defense have already taken the position that we are definitely expecting Soviet response in this area. It could even be an in-country response to develop defensive capabilities. It's interesting to ponder, too, that in the process of developing worldwide defensive systems, of course we are developing tactical defense,[15] which is not covered by the SALT agreements at all.

I looked some time back at questions of how this might be accomplished, and I believe that the only stable deployment is parallel deployment, where both countries do essentially the same thing. It is highly

[15]A defensive system which is used on a specific, local scale.

unlikely that anybody is going to get the drop on anybody else in anything this profound. There is basically nothing wrong with parallel deployment, because what we would be doing is providing a new first line of defense on both sides that has to be fought through before the offensive weapons come into play. It would give lots of time for the policy people to work out the details while all of these things are happening. So I do not agree that it's destablizing to develop these things. In fact, I think it is a logical intermediate step between the freeze-unilateral disarmament approach, and what we have now. It's an intermediate step where both countries play, and we defuse the existing powderkeg.

Another thing I want to address is the state of various technologies. I do not agree that mirror technology, for example, is highly suspect with regard to short wavelengths. Everything I know about it suggests that the required performance is entirely reachable. I think that every single major technical quantum jump that we have made has involved many uncertainties and many primitive things at the leading edge, but it is fascinating to look at how when you present the problem, it gets solved.

At the outset of the Manhattan Project, we had separated micrograms[16] of U-235 from U-238. We had a few atoms of plutonium. Nobody knew how to build a bomb. We had a full industrial base built and operating in four years after the need was established.

At the leading edge of the deployment of the ICBM program in the 1950s, the first challenge was how to shrink the size of the H-bomb by a factor of 100. The second challenge was how to make a warhead re-enter the atmosphere. People were looking at big copper ingots. Nobody had ever thought of ablative reentry which was, of course, the thing that solved the problem. All of that got done inside of five years. We built five different missiles in parallel: the Jupiter, the Thor, the Atlas, the Titan and then there was this long-shot known as the Minuteman, which used solid fuel. Of course, it is the one that was finally deployed.

So what was done in all previous successful examples was that the President said, "This is my man and I want him to get the job done." And the Congress said, "Okay, do it, and we're going to put up the support for it." And the whole thing got done on time and within budget. So it is a mistake to beg the question and prejudge any of the technologies. Instead we need to establish the objectives and the goals.

Mr. Weinrod: I thank all of you for the extremely enlightening comments. Now it is time to open the floor to questions.

Dr. Wood: I would like to make the point that objections which have

[16]One millionth of a gram.

been mustered to the tactical basis for strategic defense do not survive classified debate. That is to say, when the people who are opposed to strategic defense and who speak against it in public appear in classified forums, they are unable to make their case. I think that is a rather fundamental point. It is regrettable that the fundamental technical bases of strategic defense cannot be more widely discussed. But when they are discussed by these people, when everybody has clearances and no holds are barred, they do not make their case in front of an informed audience.

Pat Towell, *Congressional Quarterly:* I wonder if each of the four panelists could briefly crosswalk that technology against what we know in the open literature of the structure of the SDI program in the January 1984 budget. How much is in there now and how much of an increment, in your judgment and for your technology, would be useful in the first year?

Dr. Rather: I am not an expert on the congressional budgeting process, so I am really sticking my neck out. What I can say is that over the past many years, the technologies have been starving to death for the things that we're talking about, all of us I think. The only way we're going to get a resolution to this problem is to go on and have enough investment in the future of the country to find out what works and what doesn't. And we're beginning to approach that with the Strategic Defense Initiative if it can get on the spending track that has been proposed, which is a total of $26 billion in the next four years. If we can do that, then I think we will have the answers. But everything that has gone before has been very hurtful, and I frankly think we could have built a fairly successful system in the time that we have been talking about it if we had gotten busy and done it.

Dr. Codevilla: The technologies are still starving to death. The $1.7 billion that was proposed was arrived at by going down the left hand margin of the defense budget and designating certain programs as strategic defense and others as not. In fact, the programs themselves have been, in Pentagonese, "de-scoped," that is to say the scope has been reduced so that only very, very basic technology is now being addressed. Indeed, the ability of the technology, the readiness of the technology, to be integrated into systems has been reduced, in some cases very sharply.

A great deal of money is being spent to try to build an information architecture that would provide data on ballistic missiles and their debris from, as they say, "birth to death," and which will integrate all of this knowledge into a single node. In other words, an attempt is being made to reduce strategic warfare to the status of a video game. This is why Dr. DeLauer in his published statements has said that "you will be staggered at the cost" of the technologies, and that the problems involved dwarf those of the Manhattan Project. I assure you that if you approach the

defense against ballistic missiles in that way, attempting to reduce it all to a fully informed, fully inter-netted video game, the problems are indeed staggering. Of course, the Soviets don't approach it that way and common sense would not approach it that way.

Mr. Redding: People who are in charge of or very involved with any particular program in the Department of Defense have to worry about what Congress will do if Congress feels there's an upper limit of spending. It may come out of their pocket, and apples and oranges today are comparable when competing for the same funds. So there is that element. There are those who do not believe in defense as we are talking about it here, and they are fighting against it. There are constituencies of all kinds. So I fear for objectivity in all this.

In a very specific way the system I was talking about is near-term and uses state-of-the-art but advanced technology. It was submitted to the Fletcher Committee, but with concern that it would not be reviewed because of the Committee's inclination toward the long-term, I asked the gentleman who briefed industry what to submit and with what format to submit our concepts and ideas: "Will you really consider near-term?" Later I found out that it was against the marching orders of the Fletcher Committee to look at the truly near-term concepts. So to the best of my knowledge—and I have been searching—I know of no one who has examined what I am talking about in any degree at all. Most people, including the Office of Technology Assessment this morning, told me that they have not even heard of it.

Dr. Wood: I am afraid that I have to agree with the trend of the three previous remarks. The Strategic Defense Initiative as it is before the Congress at the present time has a large component of gentlemanly fraud about it. It was prepared in haste by the Pentagon bureaucracy and it is a fraud both on the President and on the Congress to attempt to show motion. They essentially swept through their programs and wrote down in the margins—so much of this program, such and such a fraction of that program, and so forth. They have suddenly discovered after March 23rd, 1983, it is really strategic defense and they thought themselves quite wonderful for having anticipated the President's policy. The amount which is proposed in the budget submission, something in the order of $1.75 billion, consists largely of relabelled programs. There is very little growth for any of the new technologies that are applicable to strategic defense in the fiscal 1985 budget submission. There is the promise, or the threat, or whatever you want to call it, that there will be substantial growth in the out-years—fiscal 1986 and beyond—which will total to $26 billion, at least that's the suggested five-year plan.

What actually happens, of course, is anybody's guess. Promises in the out years are the grown up version of fairy tales which are told to children. I would suggest to you that while $26 billion is not a negligible sum of money, it is something of the order of 6 or 7 percent of the amount which will be spent on strategic offense during the same period. Admittedly it's an apples and watermelons comparison. One is already in testing and evaluation, the other is mostly procurement, deployment and operations, but still the sums which are proposed to evaluate and develop the strategic defense technologies are negligible—literally negligible—compared to what will be spent on offense in the same period, and I suggest to you, with very little debate.

Bud Andrews, *Washington Times:* Dr. Rather, you mentioned before that we need to set a policy, we need to set objectives. What would you do beyond what the President has already done, beyond what the Pentagon hasn't already done in terms for asking for money?

Dr. Rather: The President in the last 13 months has taken the two large initial steps necessary to get a policy: he stated the policy, said what he wanted, and implied when he wanted it, although it hasn't been tied to a specific date as some of us wish that it would be. The second step has been completed just lately with the appointment of the "Star Czar" (Lt. Gen. Abrahamson). The fact that there now is a leader who is charged with delivering this is very important. The third element that is needed, of course, is to give him his budget and the necessary executive clout to get the job done, and that is what has not yet been defined. We believe that this is in process at top levels of the Administration and the Pentagon now. With those elements in place, then you can go about the business of just exactly how the budget is to be cut up to resolve the unanswered issues. The amounts of money that have been talked about are reasonable if you start looking at the individual technologies that were surveyed by the Fletcher Committee last summer, and particularly at the generic, physical and engineering questions associated with that. Then you see that the amounts of money that have been put forth are not frivolous, but are based on very reasonable scientific engineering questions.

Sidney Graybeal, Systems Planning Corporation: I would like to address a question to Dr. Rather and I would like to preface it with a comment. Dr. Wood made the point that we should explore all technologies to find the best combination of these that makes imminent progress possible. I also remind you that Johnny Foster made a comment that, "We should explore advanced technologies, as I want to have been there when the Soviets get there." So I think there's a very sound reason for doing this. But then, Dr. Rather, you made a comment that the only stable

deployment is a parallel deployment. In view of Johnny Foster's comments earlier and in view of the present Administration's concern over transfer of technology, I am not sure I understand how you would implement that recommendation.

Dr. Rather: I think it is going to become a *fait accompli* pretty soon because while we're marking time, I believe that the Soviets are pushing forward with these things and we are going to be in our traditional role of catching up. So parallelism is probably evolving naturally. I do not know more what I can say about it than that.

Mr. Graybeal: You would not care which technology?

Dr. Rather: I think that by fiat the technology is here. I think that most of the technologies are in the public arena. Edward Teller himself said to the National Press Club in October 1982 that in order to make an intelligent decision, the people of the United States need to know what all of the technical issues are. It doesn't mean you have to be an expert in all of these areas, but just that you have to have access to the knowledge, at least to the extent that you know what's being talked about. And I think that forums like this go a long way toward achieving that. What Dr. Teller said is that we could put all of these things before the world without laying down the specific engineering drawings and quantitative details on how much and how and why and wherefor. This is another thing too that upsets me about the activities of the Union of Concerned Scientists, because they are really overlooking things that are right out in the open, abundantly apparent, and the analysis they come forward with is simply myopic. So it is not a question in a case like that of requiring classified information for clarification. It is just a question of putting on blinders and not looking at the complete scope. In fact, my interest in this grew out of an interest in solar power from space. One has to generalize and broaden the scope, rather than narrow it.

Dr. Codevilla: Let me point out that Johnny Foster will find that if and when we ever get there, the Soviets will already have been there. There was a hearing in the Senate Armed Services Committee on Tuesday, April 24, 1984, at which several high and well-paid personages discoursed theoretically on the possibility of defending against short-range ballistic missiles. There was no need for that discussion to be theoretical, because the Soviet Union has a system called the SA-12 which does that job really rather well. There is no reason why we should not have a system such as the SA-12. We have the technology and have had it for a long time. We simply have chosen not to build a system like the SA-12.

Dr. Wood: I would suggest that indeed, as Dr. Codevilla indicated, the Foster dictum, while it is reasonable and prudent, has long since been

abandoned by this country. It's the case, regrettably these days, that when we get to a vantage point, we find Soviet beer cans littering the landscape. You can cite instance after instance of this. Angelo can tell you about, at least within some limits, Soviet progress in very large chemical lasers. Their program is estimated in the unclassified literature to be within three to five times the annual expenditure of of the United States. I can just point out to you that the Soviets led the open literature field during the entire period in the 1970s in short wavelength and X-ray lasers, until they abruptly stopped publishing in that area toward the end of the decade. They were not just months ahead, they were several years ahead of the entire Western effort. And that was just what they were publishing.

Again and again you can find that the Soviets, by playing tortoise to the U.S. "hare" get across the finish line first. It's not that we are equal; we are way behind. What the consequences of this will be are really very difficult to say. But they very probably will not be pleasant ones. And the thing which is most disheartening about this is that it tends to speak to the issue which President Reagan spoke to last March 23rd. He said, "Free people must voluntarily, through open debate and democratic means, meet the challenge that totalitarians pose by compulsion. It is up to us in our time to choose and choose wisely between the hard but necessary task of preserving peace and freedom, and the temptation to ignore our duty and blindly hope for the best while the enemies of freedom grow stronger day by day." It is very difficult to argue that we are not making that choice every day. And it is hard to argue that we are making it wisely.

Paul Chadwell, *National Defense Magazine:* My question is directed to Dr. Wood. Dr. Codevilla said that within five to eight years we might be in a position to defend ourselves against ballistic missiles. Now in view of the panel's discussion of all the possible combinations and ramifications of systems, do you feel that we are still five to eight years off to a solution?

Dr. Wood: If we chose to deploy the means that currently exist, the basicially off-the-shelf technologies, we could commence a significant defense against ballistic missile attack on a half-decade time scale and have it effectively in full-scale operation within a decade. I continue to believe that. And I will point out again John Rather's bit of history that we went in a four year period, admittedly under stressful wartime conditions, from nothing to the most powerful weapons by far that the world had ever seen. From the physicist's dream to operational military reality in slightly less than four years and slightly under $10 billion current dollars. It's an extremely durable sort of thing. The program which I suggested was not a crash program.

Barry Ashby, Consultant: Fred Redding talked in terms of "near-term"

being several years. I'd like to ask the other panel members for what their view of "near-term" is in light of this particular point. We all know that the national laboratories like to study technology things, that is their business. We know that a lot of American industry also does this. I would suggest then that everybody here has a vested interest, and in light of each of your vested interests, if those were set aside, what would be the near-term solution?

Dr. Wood: We are, indeed, at risk. The people of this country do deserve protection. The Constitution promised it to them as a condition of the operation of the federal government. "To provide for the common defense" was a key item in the preamble of the Constitution. But nonetheless, the U.S. government has spent in current dollars, $10 trillion on defense since the Second World War, and we have become ever less secure. Something needs to be done and it needs to be done soon.

Now sure, national laboratories and large industries, the aerospace industries, and so forth, love to do R&D. They love to extend the tech base. Some subset of the national laboratories and some subset of the aerospace industry deliver products routinely. My laboratory is one such. We ship a bomb out about every year or two—"A brand new bomb for your bomber, General." So as the founder of Apple Computer Corporation said, "True artists ship" meaning products. There are still a few artists around in the defense industry. We are very concerned with doing things and doing things soon. I just responded to a question by saying we could have things beginning in a half decade, we could have significant systems in operation within a decade. These are not pipe dreams. These are things which, while they would not completely dispose of a threat which has been a half century in development, namely the threat of attack by ballistic missiles, would go a long way towards doing it and would build technological and military momentum, I believe, to essentially complete the job by the end of this century.

Dr. Codevilla: I have no vested interest whatsoever in this. I was once a college professor and I will be one again. Senator Wallop is from Wyoming, which is a very beautiful state without laser laboratories. But let me report to you that in 1980, the Defense Advanced Research Projects Agency reported officially to the Congress that on a somewhat accelerated, but one-shift-per-day program including the Defense System Acquisition Review Council process, we could have a five- or ten-megawatt laser in orbit by late 1987. Winston Churchill once said, "The first year of an arms program you get nothing; the second year a trickle; the third year, quite a lot; the fourth, a flood." I think that's been true at all technology levels. It was true with regard to swords, rifles, atom

bombs. It is generally true in the areas of high technology as well. Much depends on how hard you work at it. Now there are some things that we don't know. We don't know how to make certain mirrors—much as we would like to—and that is one kind of problem. But most of the problems involved in strategic defense are not of that kind. They are largely of production and engineering. That's something else.

We have been talking about really high technology things, but it is quite true that nothing prevents us from building a version of the Soviet SA-12. Nothing prevents us from reactivating the ABM system which we scrapped in 1975 and which, while incapable by itself of stopping a large-scale Soviet attack, would most certainly put a dent in it. Nothing prevents us from building chemical laser battle stations now. These buildable systems, together, would provide us with very substantial protection.

The Soviet approach, and indeed the approach dictated by common sense, is to take as many bites out of a problem as quickly as one can and to let all those bites accumulate their effects. So I think we hurt ourselves if we look for ultimate weapons and ultimate solutions. One does what one can, which right now is pretty darn good, and one lets all of that accumulate.

Guest: I would like to see a headline tomorrow in *The Washington Post* that says: "The Heritage Foundation Panel Suggests Single Most Important Thing for Nation is to Set a Date" whereby we would have an operational system in space. I wonder if this panel would agree with that. I do not care if we fill these missiles with rocks or particle beams or whatever. If I were in the military today, I could very adequately manage a $27 billion program because, after all, it has no particular objective other than to increase the knowledge of understanding. However, if the President told me I had to have a system operational in five years, then I would cut out a lot of odd things that may be in that program, and I might add a few bucks where it really counts. So can we make that statement tomorrow in *The Washington Post?*

Dr. Rather: I agree with your position. I think that can be done and I think it should be done; perhaps five years, perhaps seven years. I define near term as four to eight years or five to eight years. Medium term is eight to 12. Far term is 12 to 20. And none of the things that we have been talking about are even very far into the medium term. Now some things that have not received fair attention today are the supporting systems, the command and control, acquisition, pointing, tracking, all of these things which those of us involved in this have been thinking about a lot. And all of those things require parallel development in order to make the system

work. And they are all within the near-term technology and can be done now.

Dr. Wood: I would certainly strongly support certain dates being prescribed for the strategic defense program. I believe a program which does not have quantifiable agreed upon goals is just going to waste the assets entrusted to it, whether it is strategic defense or any other program in government. If there are not bases for judgment, for assessment, for gauging progress, even on an annual basis, it will just flounder and sink into the mire and generate heat rather than light, if you will. I think it is very important that there be near-term, medium-term, and far-term goals and that they be specified by the President, agreed to by the Congress and given as a mandate to the Pentagon to carry out. And I believe that there is no need to wait until the next century to meet the first of these benchmarks or even necessarily to complete the last of them. I strongly agree that there should be specific milestones—get this done by this point and tell us how much it's going to cost. We want a forecasted capability and a forecast of cost, but get the show underway.

Dr. Codevilla: I could not agree more. Let me simply add one word with regard to the Congress, which is where I work. The Congress is very good at responding to leadership. It will respond to good leadership and it will respond to uncertain leadership. Right now, it is getting extremely uncertain leadership from the Pentagon and the White House.

Dr. Wood: It is certainly the case at the present time that the Administration position is not only not monolithic, it is not consistent. The President's mandate, issued in writing on March 23rd, called for a high priority program. It was three months before the Pentagon convened a panel to begin to study this. It was six months before they issued a massively brokered report, with all kinds of political constraints put on it not only at the beginning of the panel's work, but during the panel's work and at the end, and while they were writing the report. It took another three months for the Pentagon bureaucracy and for the National Security Council apparatus to digest this and figure out how to split up the pie with respect to management, with respect to money, with respect to control and review and this, that or whatever. The President cranked out National Security Memorandum 119 in January. Nothing has happened yet. It took two and a half months after that before they were even able to name a head of the program. The program head has yet to produce a program plan or even a program statement of goals. And the Congress is having to call for it in legislation saying, "Hey, before you start spending this money, tell us what it is that you're going to do and what you're going to head for." The fact of the matter is that the bureaucracy is in the process

of defeating the President's initiative. It's not the President's opponents who are doing it—in the public sector, or in the Congress, or anything else—it is the President's own men. They are defeating it not because they are opposed to it, but because they are not committed to it. They are defeating it because they just do not care.

Weinrod: I would like to thank all of our panelists for joining us for this discussion on the technology of strategic defense.

Panel 2

The Soviet Response to U.S. Strategic Defense

Panelists:
Rebecca Strode, National Institute for Public Policy
Robert Jastrow, Dartmouth College
William Scott, Defense Intelligence University
Robert Hotz, McGraw-Hill, Inc.
Douglas Graham, Senate Armed Services Committee

April 27, 1984
The Louis Lehrman Auditorium
The Heritage Foundation

Weinrod: I want to welcome all of you to the second panel session of The Heritage Foundation's review of strategic defense issues. This session will examine the Soviet "response" to the U.S. SDI effort. "Response" is used only for lack of a better term. It implies to some degree that the Soviets are not doing anything now, but of course, as we have already heard in the first panel, this is not the case. Nonetheless, it is possible that were the United States to go further in the direction of its own strategic defense system, the Soviets might reflect on this fact in their thinking and react to it in their policies.

Our first panelist will be Rebecca Strode. Rebecca is a senior Soviet analyst at the National Institute for Public Policy in Virginia.

Mrs. Strode: I am supposed to give a broad overview of the Soviet attitude toward the SDI. This question is oftentimes phrased: "What will be the Soviet response to the SDI?" I think perhaps it would be better to ask "What has been the United States' response to the Soviet SDI?" because in many ways it is not the United States that has taken the initiative here. The Soviet Union has had a continuing interest in strategic defense, not just ballistic missile defense, but also air defense, civil defense, and anti-submarine warfare as well. All of these components are important, and the Soviet view is that there is an offensive and defensive component to a total strategy.

In the past the Soviets have found, as have we, that ballistic missile defense is an extremely difficult problem to solve. And for that reason it has not been the highest priority. Obviously, from the shape of Soviet force structure, offensive weapons have been and remain the Soviets' top priority. But that is not to say that this is a fact with which the Soviets are pleased or satisfied, but rather that they have not yet fully resolved problems of ballistic missile defense or feel capable of doing so to the extent that they would have a truly balanced strategy; i.e., one in which defensive systems would be given the same weight as offensive systems.

Nevertheless, I think if one can view Soviet strategy as somehow having a theory of victory, it would have to include both offensive and defensive objectives. The offensive objective is the ability essentially to destroy the nuclear opponent. A basic Soviet tenet is that you do not want to fight a nuclear war twice. Peaceful coexistence and deterrence are fine prior to the initiation of a nuclear war. But at least my interpretation of what the Soviets' have arrived at is that once a conflict has come to the point of a nuclear war, the Soviets intend fully to devastate any opponent who has attacked the USSR with nuclear weapons. The Soviet government does not intend to allow a sort of post-nuclear war coexistence to be the same sort of balance of deterrence as a prewar situation. So the

offensive objectives are to destroy anyone who would strike the Soviet Union with nuclear weapons.

The defensive objective is to obtain some sort of damage limitation, not necessarily complete, but at least enough to make it reasonable to hope that one could emerge from this war not only having destroyed one's enemy, but also with some sort of viable state intact, over which you could still maintain control.

In the past I think the United States has been effective in deterring the Soviet Union by threatening to deny the Soviets the defensive objective of their strategy. They do not have confidence today, nor have they had in the past, that they could emerge from a nuclear war as a viable society. Some within the Soviet state and the military may be more or less confident, but on the whole they cannot have high confidence. They might, under some circumstances, convince the United States that it would not be in the U.S. interest to retaliate. But that requires a measure of restraint that the United States does not have to choose to exercise, so long as we have survivable missiles on the land, in the sea or in the air.

Well, why then would the Strategic Defense Initiative strengthen U.S. strategic policy if we have been successful so far? Part of the answer is that the Soviets may have a different view of the utility of strategic defense than does the United States. And this is not necessarily some difference of culture so much as a difference of strategic objectives in the offensive area. For the most part, there is a consensus in the U.S., although it is not shared by everyone, that for the Soviet Union the principal objective of damage limitation is to maintain political and military control. So this requires that you limit the damage to the party structure, the government structure, military forces that support that structure, and to some extent limit damage to industries that are essential to maintaining your state; to the extent that you can also limit damage to population, that is fine.

For the United States, we believe that our highest value is our cities as such. And therefore if you imagine a strategic defense situation in which both sides have a very credible defense, but one which is not absolutely perfect, one in which, given very high reentry vehicle inventories on both sides, you could still expect, with even say only from 1 to 5 percent leakage, to have maybe 200 or 300 penetrating reentry vehicles (RVs) from each side, then you come out with a very different impact, depending upon whether you are in the Soviet Union or the United States, with regard to what those RVs do to you.

If you are the Soviet Union, those 200 to 300 RVs that the United States can expect to hit you with if they are to attack your highest value,

have to be targeted against command control facilities and military forces. Military forces and command control facilities can be made mobile, redundant, and they can be replaced more easily than cities, which are very difficult to make mobile, redundant or to replace. So I think there is an asymetry of vulnerability to even very limited attacks. By today's standards, a 200 RV attack would be a very limited attack. But although limited on both sides, it would still make the United States, I think, asymetrically vulnerable. So that is a problem that I think the United States needs to deal with. In the case where both sides have to keep defenses that are very powerful, there may be an advantage to the Soviet Union.

Another point that I would make is that the Soviets believe that they now have some advantages in conducting protracted war. This is because they believe they have advantages in mobilizing their economy. They believe that a centralized planned economy such as they have, while it is very flawed in peacetime, actually has advantages in wartime. They also have had very useful experience in World War II, in which they performed admirably in mobilizing and sustaining military production during a very difficult war. The United States, of course, mobilized effectively in World War II as well, but it suffered no attacks on its homeland territory, at least excluding Hawaii. So I think for these two reasons, the Soviets believe that they have a greater possibility of sustaining and reproducing military force even in the event of a nuclear war, to the extent that either side could hope to mobilize. If there are effective strategic defenses on both sides, then I think one can expect that a nuclear war would be longer, and a protracted war would be more likely than would perhaps be the case without strategic defenses. This again might suggest that the Soviets would have a structural advantage in the event of a nuclear war fought with strategic defenses on both sides.

I throw these two points out because I think sometimes they are overlooked. It is clearly advantageous in the abstract for the United States to have the ability to protect itself to some extent from enemy nuclear missiles. But there are, I think, very serious strategic policy issues involved that may not necessarily be to the U.S. advantage.

The question also arises "Is this the time for the Soviets to make a major transition toward ballistic missile defense?" We see evidence that the Soviets are very interested in ballistic missile defense (BMD), and they have either pushed the treaty to its limits or have exceeded the treaty's limits already. I believe that it is unlikely that the Soviets will be the first to abrogate or withdraw from the ABM Treaty. But I think what they may do is to continue gradually improving their BMD capability,

until they have essentially put the United States in the very difficult, almost untenable, position of either accepting a unilateral Soviet ABM advantage in terms of deployed forces and potentially quickly deployed forces, or being forced to say "Enough is enough. We won't allow this unilateral advantage." At that point, the United States would withdraw from the treaty and take all the political criticism itself. I think this is another very important point, because the political ramifications may be as significant as the military.

I would like to close with a little history lesson. If we remember the "revolution in military affairs" that occurred in the USSR in the late 1950s and early 1960s, there were three events that were taking place in the Soviet Union at the time which may have made it easier for Khrushchev to instigate and push through a very radical revision of Soviet policy. First, there was leadership flux—the anti-party group, for example, had just been expelled. Second, there was a very important reorganization in command and control of the Soviet armed forces with the creation of the Strategic Rocket Forces. And finally, there was a very severe threat from the United States in the form of deployment of Polaris and Minuteman missiles, which enormously increased the magnitude of the threat from the United States. I would argue that at the present time, the Soviet Union is in a similar position. They have leadership flux, they are facing a renewed threat from the United States, with new strategic deployments taking place for the first time in a decade. They are also, I think, facing some significant reorganizations in command and control. this is true particularly at the tactical and operational level, but also at the strategic level with, for example, the disappearance of long-range aviation and Ogarkov's[1] mentioning of strategic forces without necessarily differentiating them in all cases by service. I think there is considerable flux in this area as well. So I think it would be perhaps a time which would be propitious for a change. And I would note also that both Brezhnev and Ustinov and also Andropov and Chernenko have denied that victory is possible in a nuclear war. Now this may not have any operational substance whatsoever. I think it has no operational substance. I do not believe that the Soviets have changed their deployment patterns or plans because such statements were made. But I do believe that these statements are more than mere disinformation to the West. I believe they have to do with the politicians' view of the role of arms control and bilateral re-

[1]Marshal N.V. Ogarkov: First Deputy Minister of Defense (Chief of the General Staff). He was suddenly replaced as Chief of Staff on September 6, 1984, by his first deputy, Marshal Akhromeyev.

lations versus unilateral efforts to change the balance through purely military procedures.

I think these statements also indicate a debate within the Soviet military and political hierarchy over who decides the pace of military development, with those who say that victory in a nuclear war is not possible asking the military to show some restraint in their public statements. They perhaps are even trying to pace Soviet R&D and deployments, although I would admit that is more difficult to prove. The military side essentially argues that arms control has run its course. It no longer restrains U.S. weapons developments. In fact, the Reagan Administration uses the promise of arms control as a means of justifying additional weapons—the MX is crucial because of arms control. If the USSR can make it clear that there is no hope for arms control, then some in the U.S. will ask "Why is the MX crucial?" I think the Soviet military would like, in fact, to abandon totally any reliance on the part of the Soviet leadership on arms control measures as a means of reducing the size or the pace of the U.S. military buildup.

Mr. Weinrod: Our second panelist is Dr. Robert Jastrow. Dr. Jastrow is an Adjunct Professor of Earth Science at Dartmouth College.

Dr. Jastrow: I have put together some information available in the open literature that indicates what the Soviet capabilities are. The question of what their response will be is one more of political behavior than of technology, and I am qualified to comment on that much less well than other people in this room and on this panel. As far the capabilities, none of this information will be very unfamiliar to you but, put together, it does convey a message.

One possibility is that there will be some extreme response to the stepwise implementation of SDI, if we can ever get it going, and that there might be some major escalation of tension or perhaps some use of what a number of people have suspected are concealed space weapons capabilities. There's the famous case of Cosmos 1267, for which Soviet statements suggest that about five to ten tons of payload disappeared somewhere. Apparently it was a heavy re-entry vehicle that took off the missing weight. One might wonder what was being done in this case that the Soviets did not choose to clarify, but chose instead to conceal. And then there is Cosmos 929, which engaged in elaborate maneuvers in space, consuming 800 feet per second of velocity change. And then again it disgorged some rather heavy re-entry vehicle which came to the earth. The Soviets have not given any indication what this peculiar maneuvering and deployment were. So one wonders if they are trying to test a space-based anti-satellite system.

At the extreme end of this spectrum of responses, one wonders whether one might see some mysterious malfunction of the U.S. shuttle on a future flight, perhaps with injury to the astronauts, and suspect that the Soviets are involved, and they say "Who me? No, it was a meteorite. It must have been a meteorite, I wasn't around at the time." What would the United States do in such a circumstance? It seems to me that is a very real contingency. It is like the San Andreas earthquake—something so awful that no one likes to think about it.

Then, there is the realm of more likely responses. The more likely response is that they would beef up their ABM system. As Ms. Strode mentioned, according to the Fletcher Report, and according to the comments published in the papers by everyone who has been privy to the classified information on this matter, which I am not, the Soviets are already doing all they can in the ABM area and there is little more that they could do even if they wanted to step up their effort in response to us. So the danger of an enhanced Soviet ballistic missile defense, which is mentioned frequently, is just nonsense because there is little more the Soviets could, in fact, do in this area.

They have, as you know, a two layer defense, apparently reloadable, in the process of being deployed or near deployment around Moscow. They have an SA-12 with a capability against medium and short-range missiles and possibly a capability against our submarine-launched missiles. These now have been observed in a mobile configuration. They have the radars to go with this, and it is generally thought, I gather, that the Soviet Union could put in place a national system at any time. And, of course, they have the long lead-time items, the large phased array radars—six of them now—one of them clearly in an ABM position.

The Federation of American Scientists actually swallowed hook, line, and sinker a Russian statement that this phased array radar at Abalakov was a space tracking radar. My friends have pointed out to me why any knowledgeable person understands this to be a bald-faced lie, because this radar is located to the east of the four major satellite launch stations. So let alone being able to acquire a newly lauched satellite and determine whether it has gone into a proper orbit, the Soviets could not even pick it up until 12 hours after launch. It would be absurd, because of the rotation of the earth under the orbit of the satellite, to put a space tracking radar for orbiting objects to the east of the launch sites. So that really puts the lie to that excuse and makes it plain what this system is. It is, in fact, very nicely sited to give them early coverage of submarine-launched ballistic missiles (SLBMs) launched over the Bering Sea and adjacent waters.

So the Soviets are well along in building their strategic defenses. I suppose as we proceed with our Strategic Defense Initiative they will reveal these ongoing activities, and claim they are only a response to one of our own programs. In other words, they will try to reap the propaganda benefit from painting us as the violators of the ABM Treaty. But they've been violating the ABM Treaty for a long time.

Another likely response is that they would begin to harden their ICBMs. That's not so easy. It is essentially impossible with the ICBMs, especially the SS-18, which is the most awesome element in their strategic arsenal. These are liquid-fueled. If you were to smear an ablative[2] covering on an SS-18, a "back of the envelope" calculation which was later confirmed for me as being right, indicates that one gram per square centimeter covering will weigh about two tons (4,000 pounds). That eliminates roughly two of the re-entry vehicles of the eight or ten on the SS-18—a 25 percent reduction in the strike power the SS-18 force, their largest ICBM force. That's not a bad gain for our investment in SDI.

And of course, there is the other measure suggested by the Union of Concerned Scientists, a shortened burn time for Soviet ICBMs, so that their boosters burn out in the atmosphere where X-rays cannot penetrate. This would defeat the X-ray laser. But a 50 second burn time is all that is needed for a laser to be effective and all the present Soviet ICBMs—SS-17s, 18s and 19s—have burn times of about 300 seconds.

There is another Rube Goldberg device that involves attaching a metallic window shade to the side of the missile, which is unfurled on launch to deflect the X-ray laser. I do not know how long it would to take the Soviet missile designers to recoup from that handicap, but it would certainly take a new generation of ICBMs and a new design generation to accomplish. They'll never do it. So they may try some modest hardening, "semi-soft hardening" measures. But serious hardening would mean again a new design, a new generation of Soviet missiles. To make those ICBMs that are now in the silos obsolete would be a very substantial gain if we could make it come about. I do not think that the Soviets would waste their money on hardening. Not only does the hardening mean a great reduction in payload, when you allow for the weight of ablative protection, but also means going to a solid fueled rocket, and building in a short burn time. All these changes together reduce the payload by a factor of five to ten, according to my informed friends. And this is before you allow for carrying the weight of decoys and before you allow for the attrition of

[2]Ablative coating is used to absorb large amounts of energy.

the defense itself. Before launch, just sitting in the silos, Soviet ICBMs will have had their destructive power reduced by a factor of five to ten in response to our defensive system.

I should think something different would happen in response to an effective American missile defense, and that is a shift away from the nuclear threat as the main element of their intimidation, and toward chemical and biological warfare. These horrifying methods of making war are just as gruesome as radioactive poisoning. They are well tested now by the Soviets, according to what we perceive of the evidence, and available for their purposes.

One other item, before ending this little summary. The Soviets have a new booster. They have done things right in their new generation of boosters. When we built the shuttle, we put the main engines on the shuttle in a way that requires us to throw away the main fuel tank. But the Soviets put the main engines on the fuel tank. So they have a two-in-one development here: they've got a shuttle coming along and planned for early operational use as far as we can tell, and it is lifted into orbit by a large booster which is also usable as a one-shot affair without the shuttle. The lift capability of that large booster is 300,000-400,000 pounds. It is not a Saturn V, it is a super-Saturn V. Again, I asked my knowledgeable friends what the use of that would be, because you would think you could just as well orbit the elements of a big laser battle station, for example, in pieces, without a very large booster. In fact, you would think you could bolt them up together and that would be a nice way to do it. But that is not so. You are dealing with the integration of a very complex system, especially the optics. It takes a lot of testing, under very carefully controlled circumstances on the ground, to line up the optics. To put this thing up in pieces and try to reintegrate the system in orbit would multiply the cost enormously.

So it really is a big gain to the Soviets, in their possible lofting of ASAT and BMD battle stations, to have this very large booster capability. According to the Pentagon's report on Soviet power, they are within ten years, and ten years may be a conservative estimate, of being able to put laser stations (ASAT stations, initially, but they are really the same thing as BMD stations) into orbit. So they may be doing that very soon, which brings us back to the beginning of my remarks: the potential Soviet menace to the shuttle and other U.S. space activism.

Mr. Weinrod: Our third panelist is Dr. William Scott. Dr. Scott is currently an Adjunct Professor at the Defense Intelligence University and

Senior Research Associate at the Advanced International Studies Institute.

Dr. Scott: Some who study Soviet military doctrine and Soviet military affairs believe that to understand what is going on today, it's necessary only to study what happened in the Soviet Union from the beginning of the Soviet state up until about 1934. There is a certain validity in this approach, although it could be carried too far. In the 1920s the Soviet leadership conducted a study to determine what would be the decisive weapons in the event of a future war. A decision was made at that time that these would be tanks, artillery, and aircraft. These weapons would be necessary in order to maintain a maneuver capability so that a stalemated situation would not develop as existed in World War I.

In a like manner, in the 1950s, once the Soviets had the ballistic missile, together with nuclear and thermo-nuclear weapons, major discussions took place in the Soviet Union to determine the impact of these weapons upon warfare. The decision at that time was that the nuclear weapon and the missile would be the decisive factors in any future war. Therefore, as in the 1920s, the attempt was made to achieve superiority in those weapons which would be decisive.

The first Soviet task was to overcome the strategic nuclear advantage then possessed by the United States. By the late 1960s our previous superiority had been largely countered or negated by Soviet strategic nuclear power. This was reflected in SALT I, signed in 1972. Once our strategic nuclear advantage was countered, the Soviets then proceeded with the buildup of theater forces. This did not represent a rejection of the previous military doctrine, it simply was a modification. The next step was increased attention to the projection of military power, which could be safely accomplished under their strategic nuclear umbrella.

If we start interfering with the capability the Soviets have achieved in the buildup of their strategic nuclear forces, they certainly are going to make a response. As a matter of fact, in the early 1960s, which now few people remember, the Soviets made a major effort to build up an ABM system. Billions of rubles were spent in the 1960s on the construction of ABM sites around Leningrad. Other work was done on the big ABM radars, one of which was constructed on the road between Moscow and Leningrad. Another was built on the Minsk Highway that goes from Moscow towards Warsaw. This radar is at the 69 kilometer mark, on the left side if one travels from Moscow to Minsk.

In the 1960s Soviet strategists stated that in the near future, anti-

missile and anti-space components would become the major elements of the troops of National Air Defense. Billions were spent on the buildup of an anti-ballistic missile system.

Then we MIRVed.[3] And once this happened, the Soviets rapidly had to alter their thinking. In the middle of the 1960s, Soviet spokesmen talked about the effectiveness of the ABM system. Shortly after we MIRVed, by 1969, statements in Soviet writings about the capability of their ABM had ceased.

In the first edition of Marshal Sokolovskii's *Military Strategy*, in the chapter "Methods of Conducting Future Wars," there was an entire section on problems of warfare in space. In the third edition, which came out in 1968, most of the statements on space warfare were dropped. But they added an interesting statement:

> The United States exerts great efforts for the creation of anti-missile and anti-space defense. This is caused primarily by the fact that according to the views of the military/political leadership of the USA and a number of other countries of NATO, the side which first creates an anti-missile (anti-space) defense will have a most important strategic advantage which would allow the threatening of war or its unleashing without fear of the enemies' retaliatory strikes.

One can go back and read copies of the Soviet military journal, *Aviation and Cosmonautics,* published since 1969, as well as dozens of books published in this same period, and find that the Soviets never have actually admitted they are contemplating war in space. There was some admission in the earlier 1960s that space warfare was being contemplated, especially in the first edition of *Military Strategy,* which came out in 1962, before the Cuban missile crisis. In particular, they have said very little since we MIRVed.

One wonders what the Soviets might do to counter our space effort. I suspect they have been working at this for a long time. Since the 1930s, as part of their Marxist-Leninist dialectic, they have stated that the appearance of new means of struggle brings into being corresponding countermeasures. Thus, the submarine brought about anti-submarine means; radio brought about anti-radio means; tanks, anti-tank means; and now space brings about anti-space means. This is part of the dialectic. Another part is the negation of the negation, and the law of quantitative changes brings about qualitative alterations. This sounds like gibberish to most of

[3]MIRV: Multiple independently targetable reentry vehicle—a missile payload of multiple warheads that can engage separate targets.

us. However, this is the way in which the Soviet leadership explains and justifies its military doctrine and strategy, from Marshal Ogarkov on down.

To summarize briefly, from the viewpoint of Soviet military doctrine—which in the Soviet sense is the military policy of the Communist Party, accepted by the Armed Forces as military doctrine—the political side of doctrine has not really changed since Lenin to any significant degree. But the technical side of military doctrine has changed, and will continue to change. And if we are successful in developing what the Soviets so fear—a reasonably effective anti-missile system, whether it be on the ground or in space—there will be a terrific reaction from the Soviets. This will start, of course, by propaganda means. At various meetings such as Pugwash and the Dartmouth Group, Dr. Arbatov and his group will say we should not do this.

There is nothing in published Soviet doctrinal statements to indicate whether or not they will take active means to prevent our deployment of an ABM system. But they will have to spend billions and billions of rubles to counter such a system by one means or another, and this would mean a radical change in their military priorities. In order to prevent our doing what Sokolovskii mentioned in his third edition of *Military Strategy*—the threatening or unleashing of war without fear of the enemy's retaliatory strikes—the Soviets might have to reallocate funds from the Navy's surface fleet. In another major reaction, they might have to reallocate funds from their theater nuclear forces. They cannot do everything at once. It would cause a significant change in their force structure if we do what the previous panel says we can and should do: build up a strategic defense.

Mr. Weinrod: The fourth panelist is Mr. Robert Hotz who is Senior Editorial Consultant to McGraw-Hill, Inc. He served as editor-in-chief of *Aviation Week and Space Technology* for 25 years, and is a member of the General Advisory Committee on Arms Control.

Mr. Hotz: Winston Churchill once said that there are no experts on Russia, just varying degrees of ignorance. For the past 30 years I've been trying to reduce my degree of ignorance. This includes travelling extensively in the Soviet Union and personal acquaintances with most of their top aerospace designers, both on their turf and at the international air shows, and also by some non-national and non-technical means that apparently are equally baffling to the KGB and the CIA.

I think that you're not going to see any quick decisive response to President Reagan's defense technologies initiative, simply because the Russians don't operate in that mode. They are slow, deliberate, and

inexorable. Really, the question ought to be reversed. The President's response was a response to what the Russians have been doing over the last ten or fifteen years. They have been slowly and surely developing all of the components of the second generation anti-ballistic missile system. Their first generation system was the one that Bill Scott referred to, deployed around Moscow with the old Galosh missile, and it has proved to be a pretty ineffective system. But nevertheless, they got operational experience in the deployment, command and control, and all of the infrastructure things that some of us technologists like to overlook but which are extremely important in developing a workable military system. They are building all their long-range phased array radars, and these things are multi-year construction jobs. They're the size of a 15-story building and it takes the Soviets three or four years to build them. So this is not an ephemoral effort. They've developed both an endo- and an exo-atmospheric interceptor. What they are testing at Sary Shagan right now looks very much like what Martin Marietta developed in the Sprint missile for our own ABM system about ten years ago, before the ABM treaty led us to cancel all that effort. They are testing these things at as fast a rate as they can, and they are also practicing reload capability. They are going to deploy these missiles in their already established system around Moscow where they've built a battle management radar at Pushkin, which you can see as an artists' conception in the Defense Department's latest brochure.

At Semipalatinsk they have been conducting tests for the last ten years in directed energy weapons. They were, I think, the first to use a nuclear explosive generator similar to what has been tested later at Livermore, an Excalibur. At Sary Shagan, they have an extensive laser test facility which they've been using in tests against their Salyut VII spacecraft to determine the laser effects on spacecraft in low-earth orbit. They also tested their second generation anti-satellite system on one of their Cosmos' about a year ago. And they have ground-tested a third system. And if you consider the laser efforts, which you certainly should, they have a fourth generation system underway.

On the diplomatic front, the Russians, because of their slow, deliberate system and our rather brilliant performance once we get activated, are very wary of our technical capabilities. I think both in the ABM Treaty and now in their proposed space treaties, their main objective is to slow down the rate of our technical development. They were badly burned in the space race where they started out about five years ahead of us and in the next seven years we advanced perhaps ten to twelve years ahead of them. They haven't really caught up yet. They're flying around in a

carbon copy of our orbiter shuttle. But flying it around on the back of a Bison and putting it into orbit and recovering it are more than a few years away.

Their space treaty is aimed at slowing down and curbing three distinct U.S. efforts: the anti-satellite tests, which are now just underway; inhibiting the operation of the space shuttle for military uses; and reserving for themselves the right to shoot down or destroy any direct broadcast TV satellite as a violation of Soviet sovereignty. So once again, they are using a treaty proposal to inhibit the pace of our own technical development. And they are very worried about the shuttle. I am not sure whether this stems from their own concepts of how they would use a shuttle, or whether they are giving us credit for being more clever than we really are. But just last week in Geneva I listened to the Soviet ambassador Viktor Issraelyan deliver a real tirade against the shuttle. He interpreted the capturing and repair of the Solar Max as a very sinister activity on our part. And he said, "Yes this was for peaceful purposes this time, but who knows what it will be used for the next time." So they are scared of the shuttle and they want to inhibit it in anyway that they can.

There are a number of characteristics about Soviet research and development that I think tend to sort of cloud the way we look at their developments. As I said earlier, there is nothing magic about what they do. It is slow, it is determined, and they surmount failures that would kill any technical program in this country. After all, they have killed four Cosmonauts in space without missing a lick in their space program. And they have now embarked, as Bob Jastrow noted, on a massive manned space program, with the booster as simply the core of a whole family of heavy-lift vehicles that range from beyond our Titan III capacity to beyond our Saturn V capacity. And these are available in a wide variety of combinations for a wide variety of purposes, including the launching of the components of a manned space station. They are very explicit about the fact that they are going to develop a 12 to 20 man permanent orbiting laboratory in space. And since their space program suffers from no dichotomy of trying to distinguish between peaceful and military purposes, you can be quite sure that this space station is going to have a very important military role.

There is a big gap between their basic research and their translating it into operational hardware. Dr. Lowell Wood mentioned earlier that they published a great deal of very advanced theory on lasers and then suddenly stopped this publicity as the research went into the weaponizing process. They did the same thing in high energy physics and directed energy weapons. And there again, theoretically they were way ahead of

the work in this country, and actually they have made several of the major breakthroughs in the field, such as the Tokomak machine, which is sort of a magnetic doughnut that is the first thing that can contain these enormous powers for even milliseconds. But they are not there yet. They are not there yet with their second generation ABM system; they are not there yet with their advanced anti-satellite systems; and they are not there yet with their exotic directed energy weapons. But the Soviets will keep moving and they will move at whatever pace their money, technology, and human resources will allow them to. They are not going to quit, and they are not going to do it in response to anything we do now. They are going to do it because it is part of their plan, and they will push it through to conclusion no matter how long it takes or how much they have to expend in the way of resources.

There are a couple of other things that do not show up in normal analysis of Soviet technical development, in fact, in all of Soviet life—and one of them is alcohol. The drinking problem in the Soviet Union is a national problem. And it is not just a joke. The Party leadership inveighs against it constantly. It is a tremendous drag on the industrial and technical capability of the country. And I'd like to remind you that when Viktor Belenko, the MiG-25 pilot who defected, was testifying before Congress on the readiness rate of his particular MiG-25 group, he said that the number of aircraft they could get into the air at any particular time was determined by how much of the alcohol hydraulic fluid the mechanics had been drinking. This is just a parameter as to how serious the problem really is.

The other thing is venality. Everybody in the Soviet Union, including those in the managerial system, is on the take. You might want to call it survivability rather than venality, because it is pretty much impossible to survive in the system by following the rules as they are laid down in the official book. This problem has a tremendous impact on their technology in their production facilities, because factory managers will divert material supposed to go into making MiG-25s or spacecraft to build chicken coops and sell them on the side to the local collectives, or build new housing for somebody who is short of housing. This venality is hard to measure, but it is a tremendous brake and drag on the whole system. One of the things that Andropov tried to do when he came in was to attack this problem simply as a means of improving the efficiency of the system. He called it "corruption," but I know from my own experience and my visits to the Soviet Union that there are a lot of things that are done very easily with a roll of $100 bills that other Russian officials say are impossible.

I think the Russians are in a very frustrating situation right now. they

have seen almost everything they have tried on both the diplomatic and the military front in the last three to five years fail. They are bogged down in Afghanistan, and they did not prevent the deployment of the NATO missiles in Europe. Although they think they have the strategic advantage over the United States, they haven't been able to translate it into political terms, and they see President Reagan's Administration renewing the strategic modernization program that's going to vitiate that. They are strained to the limits in doing all that they are doing right now. They are scared of another arms race because they know they cannot stand the pace. So in the meantime, while they are trying to figure out what to do about it, you are going to hear a lot of bellicose bluster. But not very much will change in the way of technology.

Mr. Weinrod: Our final panelist is Doug Graham of the Senate Armed Services Committee staff.

Mr. Graham: I thought I would limit my comments to an area in which I have at least a little bit of claim to expertise. I think I can provide some light on what the perspective is from the U.S. Congress, and in particular the Senate and the Senate Armed Services Committee on this entire problem.

The Armed Services Committee is extremely concerned about what is viewed as an increasing Soviet strategic defensive capability; I think there is a growing sympathy toward this view throughout the Senate. It is something that has been brewing for a considerable amount of time. The Soviets never gave up strategic defenses. But I think we are finally beginning to see the manifestation of several decades of very intense research, and some of these systems are starting to be deployed. The battle management radar that has received so much attention is simply the most visible of these. It is also important because, as some have mentioned, it is a "long pole in the tent" in terms of developing a defensive capability. It is something we should be very concerned about.

Other issues that have already been mentioned include the SA-12, which a number of Administration officials have reported will have capabilities against ballistic missiles. It is primarily an air defense system, but it also has a capability against tactical ballistic missiles. The modernization of the Moscow ABM system with the ABM-X3 presents problems not just because it improves their capability, but because inherent in that system is a rapid deployment capability. In conjunction with the battle management radar, that begins to take on rather ominous implications.

There is some concern in the Senate about the way that the Strategic Defense Initiative has been presented by the Administration up to this point. This is fairly clear from sitting in some of our hearings—and I know

that the Senate Foreign Relations Committee has held hearings as well—that Administration officials are not clear on what precise goals they have for the program. They are not sure what they want to defend. They are not sure how well they want or need to defend whatever it is they wish to defend. There is some uncertainty about how the program applies to the allies. There is a question of whether or not this is a system they are talking about deploying, or if it is just an aggressive research program. Is there inherent in this research program a commitment to deploy? There are all sorts of questions that I believe have good answers.

These answers have not, however, been articulated as clearly as they should have been. I will say, to defend the Administration's presentation thus far, that in my view a lot of the confusion is due to intentional misrepresentation of what the Administration has said. The President's March 23, 1983, speech is frequently cited to show that there is a great deal of confusion about what the program's goals are. I think the President was fairly clear about it being an ambitious research program at this point, with no commitment to deployment. And in my view, at least for the next twelve months or so, until we've gotten our policy issues worked out, a commitment to talk specifics about what's going to make up the system and when to deploy it is probably premature. There are a number of very important questions that have to be answered.

There are some other concerns, maybe not as widespread elsewhere as they are in the Congress. The Administration is talking about a very substantial sum of money, over $26 billion, which pales in comparison to current or planned future expenditures on strategic offensive forces. But $26 billion over the next five years for a research program, with nothing to show for it at the end of five years, particularly in view of budgetary constraints, makes no sense to a lot of Senate members. I think there is a very strong need to establish goals, timetables, and to carry out technology demonstrations; to show that, "Yes this money that we're investing is in fact bearing fruits; some of this technology that groups like the Federation of American Scientists, say can't be done, can, in fact, be done."

The critics argue, of course, that the SDI is launching an entirely new arms race in space. This is an argument that, in my view, really falls apart when you look at Soviet activities. The notion that if only we could get the United States not to proceed with our system and with only one Soviet ASAT system in existence, we could somehow maintain space as a pristine environment free from military application is, in view of the threat information we have, simply naive. The Soviets have already exploited space to a tremendous degree. They have very ambitious

research and development programs. In most areas that we are talking about in the Strategic Defense Initiative, the Soviets currently are ahead of us. Dick DeLauer, in testimony before our Committee, said that even if we were to pursue the technologies in the Strategic Defense Initiative at the level at which they are funded for the next five years, it would take a decade for us to catch up with the Soviets across the broad range of capabilities. Perhaps it is the optimist in me, but I think if we really applied ourselves to it, we probably could shorten that time frame, particularly if we apply extra resources.

Mr. Weinrod: I would like to give everybody just a minute to comment on what has been said by the other panelists, and then we can go directly into questions and answers.

Mrs. Strode: I guess one point that we didn't bring up during the first round was the Soviet Union's evaluation of the relative capabilities in the technological area of U.S. and Soviet strategic defense technologies. It seems to me this will be a critical factor in their decisions one way or the other. If the United States goes ahead and deploys strategic defensive weapons, then yes, the Soviet Union, I believe, will also do its best and deploy what it can. But in this intervening period, the pace of the Soviet SDI relative to ours will depend in part upon whether or not the Soviets believe that in an all-out, unregulated technological and deployment competition, they would be relatively better off or relatively worse off. And I would respectfully disagree just a little bit with the rather overly pessimistic view of Soviet technological innovation capability in this area presented by Dr. Hotz, because I do not believe that the Soviet scientists are alcohol abusers and I do not believe that they are drinking the antifreeze. And I know to the extent that there is under-the-table activity in the economy, it actually facilitates getting around certain problems in their planning system rather than anything else. And I do not believe that the Soviets are diverting their efforts in the strategic defense technology area to build houses for friends and things of that nature.

I think it will be a concentrated effort. I think they are very dynamic in this area. They have top-notch people. I think that some of the sluggishness of Soviet R&D in the past is almost a cultural holdover from risk aversion that was drilled into Soviet scientists during the period of Stalinist suppression, when to make a mistake was to be sent to prison or worse. I do not believe that situation exists today, and I think young Soviet scientists are willing to take risks, that they are interested in innovation and the Party supports them in that. I believe they will be a dynamic technological competitor.

Just briefly, the second point that I would make is that if we do move to-

ward strategic defenses we must remember that we are beginning from a significant gap in capabilities, not only in ballistic missile defense, whether it be space- or ground-based, but also in the area of air defense. It makes no sense to build a ballistic missile defense if you are not going to prevent Soviet bombers from penetrating your air space. And we have virtually no capability at the present to do that. The Soviets already have a tremendous capability to threaten the penetration of our bombers.

So we have to think about not only the $26 billion and the follow-on for deployment to move toward ballistic missile defense, but we also have to think about deploying the equivalent of the Soviet SAM network, which again is an enormous diversion of resources. I believe that it is unlikely that we can expand our strategic defense pie by that much. So I think that if we move seriously toward integrated ballistic and air defense, we will have to find some of the money by diverting it away from our offensive forces. I think we must seriously consider to what extent we would be hurting our capability to deter the Soviets via offensive threats during this transition period. If we slow down our offensive modernization in order to pay for the defensive systems, then before those defensive systems are mature, how will this affect the strategic balance and therefore strategic stability. I think that's a serious issue to raise.

Dr. Scott: We have been reacting so long to Soviet moves, I think it is time, as the previous panel suggested, that we take the initiative. Perhaps we can even, in some way, control or at least move the Soviets in their reaction to what we might do.

Mr. Hotz: Without getting into my own capacity for vodka, both the standard kind and the Ukrainian pepper vodka, which even the Russians say is not fit to drink, but should be used only for jet fuel, I would like to rebut our panelist here [Rebecca Strode]. I have personally engaged in some pretty severe drinking bouts with top-level Soviet scientists and engineers and I know for a fact that they did not show up for work for a number of days afterwards. They do not have to sneak the hydraulic fluid. They do it in the Scientists' Club, or the so-called "vlasti," where the privileged class behaves like nobody else. They are almost like the old dukes and duchesses of the Czarist days. They eat different food, they wear different clothes, they can go into the "gastronoms" and buy Danish ham and Scotch whiskey. I had the unpleasant experience of having an unprivileged Soviet citizen spit on us as we came out of a "gastronom" because he thought we were part of the "vlasti."

The Soviet Union is a lot different when you look at it from the inside than when you look at it from the outside.

Mr. Weinrod: Now I would like to open the floor for questions and discussion.

Sidney Graybeal, Systems Planning Corporation: I would like to direct a question to Mr. Graham and Dr. Scott. Mr. Graham made a comment that indicated an incentive on the Soviets' part to break out of the ABM Treaty. I would like to raise a couple of other issues and ask his comments on them.

From a personal viewpoint, I have difficulty in finding a reason for a Soviet incentive to break out of the ABM Treaty, when it is well known that they have an active ABM R&D program, they have an anti-tactical system which is capitalizing on a loophole on the ABM Treaty, they have a very extensive air defense system, and they have an extensive civil defense system. So they are accomplishing, it appears to be, 90 percent of what they need to within the context of the ABM Treaty. So what's the incentive to break out, when they look at the U.S. program and, if the previous panel is correct, we've established a deadline, we've moved to technological demonstrations which will require us to take actions which would be inconsistent with the Treaty. They can force us into the political situation and have to be the one to propose amendments to the Treaty. If they do not accept them, then we've either got to stop that movement or break out of the Treaty. And then we take all the political harassment of the free world and the allies for being the ones that removed the cornerstone of arms control.

Dr. Scott: I think one can make a fairly persuasive case that the Soviets are abrogating the ABM Treaty as we speak. I do not see why there's any particular hesitation on their part to do it. I do not think we are providing them incentive. I think they would have done it anyhow. Based on our "staunch" reactions to things like the shooting down of airliners and that sort of thing, their calculation may be that our response would be minimal and worth risking. And I agree with you. That's why I couched it as an overt breakout as opposed to a breaking out of the spirit and intent of the Treaty, without even having to do it overtly. The SA-12 is a perfect non-overt way of breaking out of the Treaty.

Mr. Graybeal: But you are talking about circumvention of the Treaty as contrasted to breaking out. The SA-12 has not been tested against a strategic ballistic missile or its elementary flight trajectory. It is an anti-tactical system which can be given capabilities to engage the Pershing and to engage certain SLBMs. So they are circumventing the Treaty. They are not living up to the spirit of the Treaty, but the spirit of the Treaty has absolutely no meaning in the Soviet Union. That is an American invention.

Mr. Graham: I do not want to get into classified material. Defense Department officials have made public statements that the SA-12 currently has the inherent capability to counter ballistic missiles.

Mr. Graybeal: I am not quarrelling with that, I am agreeing with that. That to me is a reason they are circumventing and they do not have an incentive to break out. They can accomplish their objectives without abrogating the ABM Treaty.

Mr. Graham: I do not disagree with you at all.

Mr. Hotz: Many academic scientists and a large fraction of the media refuse to believe that the Soviets are trying to circumvent this Treaty, so they have a very ripe and promising propaganda situation still ahead to be developed.

Dr. Scott: Last summer, I spent a very exciting three months seeing what the Soviets have written about chemical warfare. I've been looking at the writings over the past 20 years. At times they have even denied they have chemical weapons. They have absolutely no intention of using chemical weapons even for retaliation. This is what the writings state, this is what they state again, and again, and again. The Department of Defense is certain that they do have a chemical warfare capability. They simply will go on quietly doing what they think they should do. They will not make any noises about it. They will deny what they are doing. If we find evidence of it, they will deny it. A great many people in this country will believe them and they will simply go their own way, treaty or no treaty. In this country we are always in danger of not following logic. I think that is one of the problems we have to face. Everything is publicly discussed in the United States. We are in a different situation.

Mr. Graybeal: Do you feel they would overtly break out of the ABM Treaty?

Dr. Scott: At a given time if they felt they had to.

Mr. Graham: There may be certain advantages to be gained by doing so in terms of gauging our reactions.

Tom Krebs, High Frontier: I recently left the Defense Intelligence Agency where I worked on the Soviet space program for four years. I would like to say I agree that the Soviets are quite interested in this technology, especially as it pertains to space. They may very well go towards strategic defense even more than the U.S. is able to. It seems to me that as the U.S. puts up a ballistic defense system in space, it is very, very likely that the Soviets will move along in about the same time frame, if not in advance of ours.

Some people say this could make ballistic missiles obsolete. Others say no, they will be multiplied by a factor of 20 and have all kinds of countermeasures. Also, Dr. Strode, you mentioned we do not have an air defense system, but others have said that some of these ABM systems, especially the laser systems, could be used as very effective anti-air

systems—almost two for the price of one. So maybe you do not have to make that tradeoff.

But my question really is this: if both sides put up a pretty effective ABM, 95 percent or so, and a pretty effective air defense, is it within the scope of possibility in your mind that we might actually see a reduction of nuclear weapons, one that can be agreed upon? We are still talking about Soviet attitudes. Would that be in the realm of the possibility of Soviet attitudes to basically scrap these weapons when it becomes so difficult do deliver them?

Mrs. Strode: My feeling is that at least in the early phase, a strategic defensive system or systems would be most effective if you could put very severe limitations on and obtain very radical reductions in offensive weapons. So if the Soviets are genuinely interested in highly effective strategic defense of their homeland only; that is, if they have only the defensive objective of removing the threat of nuclear weapons from the the face of the earth, then their incentive would be to accompany their strategic defensive deployments with radical reductions in offensive weapons. I think in the United States there are people who believe that that should be our particular strategy; that we should be interested not in annihilating the other side, but in defending our own people and therefore we should also combine these two approaches: large deployments of defenses and radical reductions of offensive weapons. However, I do not believe that that's the Soviet view.

As I mentioned at the very beginning of my talk, the Soviets have both offensive and defensive objectives in their strategy. And I've never seen any indication that they consider the two to be competing. They both want to be able to destroy their opponent in the event of nuclear war (in order to eliminate the risk of another war in the future because it is just too damaging), and also, they want to be able to limit damage to their homeland. So I think that in the Soviet case, because they will want, in order to really have a theory of victory, both offensive and defensive objectives, they will be unlikely to accept very large reductions in offensive weapons. In fact, they probably will need for their offensive capability, in the face of U.S. strategic defenses, more weapons. This raises a dilemma for the Soviets, because their own defenses would probably be more effective if they could get some kind of offensive reductions. It is a problem that I do not believe that either the USSR or the United States has really worked out. I think they would try to find a balance. But I also would agree with Dr. Jastrow, who pointed out that the emphasis would also rise on weapons that circumvent nuclear weapons and still are weapons of mass destruction. And I think that chemical and

biological weapons might become a more important part of Soviet strategy. That also is a problem—because they have greater capabilities in that area than we do—for moral and political reasons, as well as technical.

Dr. Jastrow: I think there is no question that events will take the course that you suggested in the light of something I heard today. I had known from the work of Guy Barasch and others that for terminal defense (point defense), the cost tradeoff favors the defense over the offense by two to one. And we heard today that an X-ray laser is a promising line of booster reduction, the cost tradeoff between 10 and 100 to one according to Lowell Wood. So those numbers indicate that indeed nuclear weapons will become obsolete. The Soviets cannot outbuild our defense with those figures.

Mr. Graham: I have a hard time, and I'm a technological optimist, envisioning a defensive system that would be so effective that I would be willing to get rid of all of my nuclear weapons. In my view, defense can play a very important role in enhancing the effectivenss of your deterrent and therefore deterring war. But I can't envision one that is perfect enough that I would be willing to just give our nuclear weapons away. As long as there is a Soviet Union, I do not think I am going to be inclined to do that.

Number two, I do not believe that we're going to induce the Soviets to give up any of their offensive weapons just because we enhanced the role of defense in our strategic policy. I do not think the Soviets, out of goodwill, are going to be giving up their offensive forces. I do think, however, that we can induce the Soviets to reduce their reliance on offensive forces. The way we can do that is to solve the technological challenge of achieving boost-phase missile intercept. There is a tremendous disincentive to proliferate offensive weapons if we can do that, because it is no longer effective. I think we can induce the Soviets to reduce their offensive forces not out of goodwill and desire for peace, which they do not have—remember they have nuclear weapons for a very good reason—but by reducing the military benefits of expending resources on strategic offensive forces.

Charles Doe, *Army Times:* Would one or more of the panel care to wargame an initial U.S. deployment of, let us say, a battle mirror. That first one goes up and goes into orbit and it drifts over the Soviet land mass. Assuming they know it is coming, and they will, what then?

Dr. Jastrow: How many satellites would this be?

Mr. Doe: This is not my program.

Mr. Graham: Under what circumstances have we launched this mirror?

Guest: Let us say that the first mirror(s) are up (whatever the scenario would be of a plausible deployment); what will the Soviets do then?

Dr. Scott: In the event of a deployment of satellites, I am not certain exactly. There's one scheme where we might deploy several hundred satellites as part of our defense systems. I think there's a good possibility in that case, if they were to come over the Soviet Union at low earth orbit, they would try to take them out.

Dr. Jastrow: But you must remember that this system of satellites, our stations, will not be deployed until they have been well protected. It would be senseless to deploy them before they have been protected by proliferation and hardening and so on. So it just will not happen in that way.

Mr. Hotz: I would like to just point out that when the U.S. launches a Trident submarine, there are a lot of missiles and a lot of RVs on those missiles, and it has not happened yet that the Soviets have tried to sink it as its being deployed. It is very unlikely, it seems to me, that they are going to try and knock out a defensive system when we deploy it.

Pat Towell, *Congressional Quarterly:* Would any of you care within the limits of what is openly available, to give us the sense of the time frame within which from right now the Soviets could deploy using these precursor systems that they have in place in the SA-12 or whatever, the time frame within which they could deploy a defensive system that would be strategically significant in their terms of reference. I realize that we could be talking about any of the number of levels of what is an effective system. Could you give me a guess of what we are talking about: two or three years, ten years?

Mr. Hotz: Sure, I will give you a guess. I would say five years, because the systems that they have now are still in a test phase. A number of those tests have failed. They are not there yet. They ran both an ABM test and an anti-satellite test as their precursor to their nuclear war exercise about a year ago. One ABM failed and a satellite test failed. They are not there yet even though they have the hardware and they are testing it. So I would say, just as a guess, five years.

Mr. Graham: I will take a stab at that if there's a moment. Let us just assume they do deploy a terminal defense system. Let us assume that they have deployed SA-12s all over the country, which they are in the process of doing. And let us say that they have completed their battle management radar. If they were then to decide to rapidly deploy, let us say for example, Galosh ABM interceptors, the modernized ones, throughout the country, it could be done in a matter of several years. And while this alone

would not defeat the United States, it would create very serious military implications for us. It would substantially degrade the effectiveness of our strategic deterrent.

Guest: It seems to me that I read somewhere that Kosygin in 1967 made the comment, and I do not know if this was general Russian thinking or if it is still this way, that they would much rather defend than offend. In other words, be defensive than offensive.

Dr. Jastrow: It is more pointed than that. It is a famous remark that has been quoted by a number of people. But in Kissinger's memoirs he quoted it twice, he thought it was so interesting. He says that Kosygin said this was the most crazy suggestion that he had ever heard of. "How do you expect me to tell the Russian people that they are not allowed to protect themselves?" Kosygin asked. He just thought it was crazy and Kissinger's memoirs clarify that the Soviets continued to think it was crazy, and wouldn't touch the ABM treaty and MAD with a ten-foot pole in the SALT I discussions, until the Senate voted by one vote to deploy our Safeguard ABM defense. And then, Kissinger said, they would not talk about anything else, they wanted that ABM Treaty so badly. As soon as we started to deploy our ABM system, they wanted to take us out of the action. And then, of course, they promptly proceeded to cheat on the ABM treaty after they signed it.

Mrs. Strode: I would just like to point out that is a very famous statement and there are those who believe that the Soviet Union's views on ballistic missile defense actually changed during the course of the SALT I negotiations. In the back of the room we have Dr. Raymond Gartoff, who is a principal proponent of that interpretation; I hope I am not misrepresenting his views. There are differences of opinion as to whether or not that statement is still relevant today to Soviet views.

Raymond Gartoff, Brookings Institution: It is true that Kosygin did make the remark somewhat along these lines, although it did not in fact get distributed because of an error that the interpreter made. As for a discussion of the changing Soviet military situation and the political evaluations of the ballistic missile defense in the late 1960s preceding, leading up to, and in SALT I negotiations, I have laid this out in a chapter on ABM and East-West relations in a recently published book on ballistic missile defenses edited by Ashton Carter and David Schwartz and published by Brookings.

Dr. Jastrow: I would defer to your expertise without question in this whole area because it is well known, but on this one point it seems to me that Kissinger, who was orchestrating the American position and negotiations in that matter, really must be our accurate source. If he says the

Soviets switched suddenly after that Senate vote, you have to give some credence to that statement.

Mr. Gartoff: Kissinger also was not involved in it until the time that the Soviets decided to go ahead with SALT negotiations with a strong emphasis on ABM in 1968. Of course, the talks were then aborted because of the Soviet occupation of Czechoslovakia and because of the election in the U.S. and so forth. In the beginning of SALT negotiations in November 1969, the Soviet delegation on the very first day made very clear that they were prepared to consider a very low or zero ABM deployment and that it would be undesirable to have heavy ABM deployment on the two sides and that they were prepared to consider something that was strictly limited as well. This was all before the Senate votes of 1970. There were ample indications during that period of the change of Soviet views from the ones which had dominated their political and military statements made in the early 1960s and again . . .

Dr. Jastrow: This is a problem between you and Kissinger. I recently reread that portion of Kissinger's memoirs and the version I gave you is what he remembers.

Mr. Weinrod: I think on that note we will wind up this session. I want to thank our panelists very much.

Panel 3

Strategic Defense and Arms Control

Panelists:
Carnes Lord, Consultant
David Wollan, Arms Control and Disarmament Agency
Keith Payne, National Institute for Public Policy
Joseph T. Mayer, Senate Select Committee on Intelligence

May 4, 1984
The Louis Lehrman Auditorium
The Heritage Foundation

Bruce Weinrod: Welcome to the second in our series of afternoon panel discussions on Strategic Defense. Last week, there were two panels. The first discussed the technologies of strategic defense, while the second discussed possible Soviet reactions to the U.S. initiatives in the area of strategic defense—although as we emphasized at the time, that may not be the best term, since the Soviets have been involved in this area all along anyway.

Both of these issues that we addressed last week are very fundamental in the sense that your conclusions or assumptions about these matters will determine to some degree, and perhaps to a large degree, what your conclusions are about the policy implications of strategic defense.

We are now ready to move into perhaps the most crucial policy issues related to strategic defense, and these are: the implications of strategic defense for arms control and the question of how a transition to strategic defense would occur and the implications of such a transition, and the final stage itself for strategic stability.

Our first panel will address the first of these issues. With respect to arms control, it should be said at the outset that we are not assuming here that arms control, defined as a treaty, is necessarily the only—or even the best—approach to reducing the likelihood of a nuclear catastrophe. There may be other approaches, perhaps involving strategic defense, which would give a better result than a particular treaty, or alternatively, may serve as an incentive to genuine and equitable arms reduction agreements.

To discuss this subject, we have with us today a distinguished panel and we will begin with Carey Lord. Carey was, as many of you know, on the National Security Council staff for nearly three years and also was a professor at the University of Virginia.

Dr. Lord: Since strategic defense and the debate that has grown up around it brings us back in many ways to first principles of our strategic posture and the U.S. strategic doctrine, I think it makes sense in this gathering to begin with some first principles. What I want to do here, just very briefly, is to try to focus on the Soviet perspective on strategic defense. Perhaps to some extent this was discussed at last week's panel. However, as a framework for considering the arms control aspect of strategic defense, I think it is essential to begin by putting the arms control issue in the general context of the U.S.-Soviet relationship. We must particularly focus on the real differences between the United States and the Soviet Union when it comes to arms control and the ways those differences shape the Soviet perspective on strategic defense and the relationship between strategic defense and offense.

Not to belabor what I think has become a fairly widely accepted view

over the last several years, but the Soviets approach arms control in a very different spirit than the United States. If only to look at the organizational side of it, it's well known that arms control policy is set in the Soviet Union in the Ministry of Defense. It's dominated by the military—very different from our own system, where the State Department plays an important role; and we have an Arms Control and Disarmament Agency, of course, which has no counterpart in the Soviet Union. Arms control is a much more central part of, let's say, high policy in the United States than in the Soviet Union, where it is seen on the one hand as a reflection of military policy and Soviet military requirements, and on the other as an instrument of propaganda and political warfare.

If one looks back at the history of SALT and strategic arms control generally, I think one would find widespread agreement that the motive for the Soviet Union to agree to a treaty limiting strategic defense initially in 1972 had much more to do with Soviet calculations regarding their own military requirements, and the likelihood of the United States developing these kinds of weapons, than it did with the kind of view that one tends to run into in the United States, which is that here was an area of weaponry that needed to be controlled simply because it was there and control was perhaps feasible.

The fundamental difference, of course, between the U.S. and Soviet views of strategic defense really goes back to the McNamara days and the venerable notion of assured destruction. I will not run through all that, except to say that it is pretty generally agreed now that the Soviet Union does not and has never shared that kind of perspective on nuclear weapons. Specifically, as far as defense is concerned, the Soviets have always regarded defense as simply common sense—as one indispensable part of any military posture, and as something not particularly destabilizing (to use the term of art). And Soviet military doctrine continues, in fact, to recognize the importance of strategic defense in general and ballistic missile defense in particular. It's striking and interesting that ballistic missile defense (BMD) has been described by an authoritative Soviet spokesman since the signing of the ABM Treaty in 1972 as an integral part and central mission of Soviet air defense. Now it is also interesting, from an organizational point of view, to consider the implications of the fact that ballistic missile defense and air defense in the Soviet Union are taken care of by the same military organization—the Air Defense Forces. The Air Defense Forces have no equivalent in this country, where air defense is the mission of the Air Force, and BMD has belonged to the Army. In the Soviet Union, those two activities have

proceeded from the beginning in a very tightly coordinated pattern. Certain systems for air defense have been developed by the Soviets from the beginning with BMD capability, or certainly with the intention of being dual capable systems—I'll come back to that shortly. But I think that is a very significant fact. The Soviets do not talk very much in their open literature about what they see as the role of BMD, but there are some very striking statements, as I say, that have been made since the signing of the Treaty to indicate that the Soviets still regard the BMD mission as something that their military forces need to be able to carry out.

Going beyond that is the somewhat more controversial, but I think a very sustainable argument that has been made by Bill Lee[1] among others—that if you look at the overall Soviet defense posture, and particularly their strategic defenses, you will see a very interesting gap in the area of ballistic missile defense. The Soviets have developed their air defense into a massive nationwide system—something which, again, has no real equivalent in the United States at this time. But the Soviet civil defense program also provides another very important element of strategic defense overall. If you try to analyze the capabilities and the intentions behind these different elements of strategic defense, I think a very good case could be made that the entire Soviet strategic defense posture doesn't make any sense without the BMD link or plug filling in that particular sector.

What this suggests is that there is a strong presumption—I would use that word advisedly—that the Soviet Union will, in the not too distant future, take steps to provide itself an active BMD capability. The term sometimes used in the context of the ABM Treaty regime is, of course, "breakout." In the not too distant future, the Soviets may decide that the ABM Treaty no longer serves their national interest, and "break out" of it either by covertly deploying elements of a BMD system or by simply abrogating it, presumably after the six-month notice period that's written into the treaty—something which can be done quite legally. The Soviets could in this way very quickly deploy elements of something approaching a complete nationwide BMD system.

The point I would stress is that what the Soviets do with regard to ballistic missile defense very much depends on their own view of their own military requirements and probably very little on what the United States

[1]William Lee is a former CIA employee and private consultant who is now studying the Soviet nuclear posture at DIA.

does. I think a very good case could be made that the Soviets will leave the ABM Treaty—the ABM Treaty regime—regardless of anything the United States does in the area of strategic defense.

Current Soviet activities in the areas of BMD pose some interesting problems. I would comment on just one or two which bear directly on today's topic. One problem which I think has not been adequately discussed is the relationship between BMD and air defense. Here one can raise real questions as to the intentions the Soviets have had all along in developing air defense systems that would be capable to some degree of ballistic missile defense. One can certainly argue that the Soviets have violated the spirit, if not the letter, of the ABM Treaty by testing, developing and deploying an air defense system—the SA-5 and SA-10 missiles and associated radars—that, in fact, is a dual-capable system. A particularly worrisome element of the Soviet program is the new SA-X-12 so-called "tactical ABM" system which has been tested and demonstrated against ballistic missiles as well as aircraft, and probably has capabilities against not only the Pershing II but even some American strategic missiles.

But entirely apart from the question of intention is the question of capabilities. The fact is that developments in air defense technologies over recent years have led to a fundamental blurring of the dividing line between air defense and ballistic missile defense. This raises a fundamental question as to the future of the ABM Treaty regime, and is something that I think has not really been addressed in public discussions to any considerable degree. Soviet air defense also is something that is too often overlooked in discussions of U.S. START positions, because, of course, the United States in START (and in SALT in the past) has limited or been willing to limit its own air-breathing strategic systems—bombers and cruise missiles—without any corresponding limits on the systems they would go against. The Soviets have an enormous and completely unconstrained air defense system—unconstrained in an arms control sense. What, if anything, can be done to bring air defense within arms control I think is a very interesting question. I won't take it further than that here.

One other development that has to be mentioned in the context of looking at Soviet attitudes toward the ABM Treaty is the recent discovery by the U.S. that the Soviets are building a new Ballistic Missile Early Warning radar at Krasnoyarsk in Siberia, in clear contravention of the ABM Treaty requirement that these kinds of radars should be built only on the periphery of the Soviet Union and facing outwards. This has been discussed in the President's compliance report to the Congress, where it's

described as something "almost certainly" in violation of the ABM Treaty. I think those who are familiar with the evidence have very little doubt that it is a clear violation of the meaning of the ABM Treaty text.

This is important both in its own right, as an indication of Soviet seriousness in developing a nationwide ABM battle management radar capability, and also as an indication of Soviet intentions in the BMD area. I think one now really has to question whether the Soviets have not in fact made a decision to break out of the ABM Treaty, of which this is the first and necessary indication because of it's being a long lead-time item in the construction of a nationwide ABM system. I think one could argue—and I would put this forth very tentatively—that the Soviets made a decision to break out in the period 1978-1979. This may have been partly in response to PD 59,[2] the Carter Administration's revision of U.S. nuclear targeting policy, the so-called "countervailing strategy"—a very neuralgic subject in the Soviet literature at that time—and partly to the decision by the Carter Administration to go ahead with the MX, something which the Soviets clearly regard as a qualitative and, to them, worrisome development in the U.S. strategic offensive program, and possibly also the Pershing II, for its threat to hardened command, control and communications facilities in the western Soviet Union.

The estimates are that the Krasnoyarsk radar will probably be operational in 1987 or so. At around that time the Soviets could have a substantial stockpile of components of a new nationwide ABM system, including the BMEWs radars,[3] the ABM-X-3 system and modern SAM systems deployed in large numbers with dual capability.[4] These could well face the United States with a massive and relatively effective Soviet ABM capability by the time we are in fact beginning deployment of the MX missile, if we ever do. One could certainly speculate that the timetable for a Soviet breakout could well be calibrated to the deployments of MX and perhaps Pershing.

The Soviets probably recognize the significant political constraints on a breakout from the ABM Treaty. Clearly they are sensitive to opinion in the United States and Western Europe favoring arms control, and they

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[2]PD 59: President Carter's Presidential Directive which dealt with the targeting of missiles at Russian military forces. PD 59 placed a greater emphasis on targeting command and control centers, and more flexibility in targeting certain conventional forces on a European battlefield.

[3]BMEW Radar: The Ballistic Missile Early Warning system involves an electronic surveillance screen designed to detect ballistic missile attacks and notify authorities.

[4]ABM-X-3: The upgraded version of the Moscow defense system. Modern SAM systems include the SA-10 and SA-12, which have dual capability against planes and missiles.

would be reluctant to jeopardize their good standing—if they still enjoy it—as being serious about arms control. Yet I would remind you of the risks of assuming that the Soviets will be deterred from actions like this by fear of world opinion or fear of U.S. reactions. I would simply call your attention to the penalties the Soviets have suffered because of their violation of the various chemical and biological weapons (CBW) treaties—in other words, very little. In the CBW case, the Soviets probably made a calculated decision to proceed with the use of weapons that were banned by treaty on the assumption that world reaction would be containable, and in fact it has proved to be quite containable. So I think it would be a mistake to depend on the Soviets' judgment of political factors alone to restrain them from breakout of the ABM Treaty. Particularly if such a move were coupled with a well thought out political strategy to blame the United States for the breakdown of strategic arms control, the Soviets could well deflect a lot of the political damage that might be incurred otherwise.

The real question, though, is whether a U.S. move toward BMD would provide incentives for the Soviets to continue within an ABM Treaty regime and to engage seriously in arms control talks over strategic offensive systems. I think a very good case can be made that a U.S. move toward strategic defense, and ballistic missile defense in particular, could have large advantages for arms control generally. The fundamental reason for that is that ballistic missile defense would do more than any other system we could realistically hope for to neutralize the gross advantages the Soviets have derived from the strategic history of the West in the last ten to fifteen years—both the political and the military advantages. The Soviets have developed a nuclear strategy which has proved eminently successful as a political strategy. They have succeeded to a very large extent in making a reality of what at one time seemed simply declaratory policy—namely, a preemptive, damage-limiting nuclear posture.[6] Nothing that the U.S. could do would more to attack that Soviet strategy than a move toward strategic defense. And nothing would more reduce the prospects in Soviet eyes for the future attainment of decisive nuclear or military superiority over the U.S. Only if the Soviets become convinced of the impossibility of this is there even a chance that they will deal seriously in the arms control arena.

Mr. Weinrod: Our second speaker today will be Dr. David Wollan. Dr.

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[5]Damage limitation involves active/passive efforts to restrict the level of devastation during a war. This includes actions against enemy military and retaliatory capabilities as well as civil defense measures.

Wollan is a physicist on the staff of the Strategic Affairs Division of the Arms Control and Disarmament Agency.

Dr. Wollan: Thank you for inviting me here today. I think it might be useful to say a few words about the Administration program for the Strategic Defense Initiative just to set some of the background. From reading your summary of what went on at the last session, a lot of people floated a lot of ideas and that's very useful, but there is an Administration policy, and I think you should be aware of it.

As you all know, last March 23rd (1983), President Reagan made a speech in which he discussed a long-term research and development program to begin to achieve our ultimate goal of eliminating the threat posed by strategic nuclear ballistic missiles. The idea would be to decrease U.S. reliance on offensive nuclear arms to maintain U.S. security and that of our allies. And as you all know, there have been big study programs, decisions have been made, and there now is a Strategic Defense Initiative Office set up over in the Pentagon with a budget increase of 40 percent or so over what had been allocated before the March 23rd speech.

To set the background, it might be helpful for you to know what that program is, just in its broadest outlines. First of all, the U.S. Strategic Defense Initiative is a program for research in a broad range of technologies for ballistic missile defense. The United States has made no decision to develop or deploy an ABM system. This program runs basically through the late 1980s. I could never figure out where five-year defense plans in fiscal years end, but we're basically talking through the end of this decade. And all of what I'm giving you is the standard litany of Administration policies. So this is well cleared.

The research effort in the Strategic Defense Initiative is and will be consistent with all current U.S. treaty obligations. With respect to defensive technologies, a lot of studies were made last summer by the Fletcher Panel, that most of you have heard about. Their conclusion was that new technologies are becoming available that justify a major research effort in BMD. They determined that we do not know enough now to make a decision about whether such a defense is really feasible and cost-effective, but with a good aggressive program, which is the one that the Administration has adopted, essentially technology-limited not budget-limited, this program would put the United States government in a position to make informed decisions in the early 1990s about whether or not to initiate full-scale engineering development. An affirmative decision could lead to deployment after the year 2000.

Now in addition, it is clear—and Carey Lord made this point concern-

ing the large and aggressive Soviet ABM programs, both the operational Moscow system and its upgrade and their R&D—that this, at a minimum, is a prudent hedge against Soviet actions in this area. We do not need to detail this for you.

Now in terms of focusing on the arms control aspects of this, I thought it would be useful to address some of the questions that have arisen, and in particular the ones that Bruce asked the panelists to concentrate on. So I'll focus around that Socratic framework if you like. Others can ask about this in the question period.

One of the first questions is what would be the impact of a shift to strategic defense on existing arms control agreements? Well, it is clear that the existing ABM Treaty has, as an essential premise, extremely strict limits on deployed ballistic missile defense. At a minimum, we would have to revise, if not abandon the ABM Treaty. There are other treaties that might be involved too: the Outer Space Treaty, the Limited Test Ban Treaty and so on, and you might want to follow that up in the question period. From the Administration's standpoint, we're really talking in terms of treaty revisions, given this program, something that would happen in the next decade or beyond, should we make a decision.

If we make a decision to go in the direction of greatly increased ballistic missile defenses, the idea would be to seek a combination of limits on both strategic offensive and strategic defensive forces that could enforce the stability of that regime, both the transition to a defense-oriented regime and life in a defense-oriented regime. As we've seen in the offense-dominated regime, lots of things can happen concerning stability. So even a defense-oriented regime in the next century would pose its own problems and opportunities that we'd have to deal with.

Now how would this kind of shift, should it take place, affect arms control negotiations with the Soviet Union, and how would this effect the so-called arms race? Well, just to recapitulate some points that have been made—first of all, the Soviets do have very vigorous ABM programs. They have had them for decades now both in the operational and R&D areas. Another key point is that the Soviets have had a massive buildup in strategic offensive arms especially, though not limited to, the period since 1972, when the ABM Treaty was signed and became law. You may recall that one of the objectives of the ABM Treaty was to set low limits on strategic defenses against ballistic missiles, and thereby permit reductions, especially in strategic ballistic missiles because we would not need a lot of extra missiles simply to penetrate defense. But in fact the Soviets have had a massive buildup, especially in their ballistic missile and ICBM forces, and their MIRV forces, with a large number of reentry vehicles.

Now if we were to shift to a defense-oriented world, we would hope that the Soviets would see the virtue of it. Other reasons, as Carey Lord indicated, given their own capabilities, their own air defense, civil defense, and their own military doctrine and strategy, indicate that the Soviets should want to move in that direction, although its not necessary that they would. They might want to move in it for themselves, for example, but not for us. As I indicated, what we would attempt to do in that case is to try to have an arms control regime limiting both offense and defense that could enhance stability at that time.

Now what kind of measures could we take? And here I'm going to be a little speculative, and I will indicate some ideas and maybe we can discuss them further. I think a cooperative regime would be better in the sense that it would lead to less stresses certainly for our expenses and the viability of our defenses. Unfortunately the nature of the transition itself depends on lots of things we don't know much about today, for example, the technical aspects of the future BMD systems of both sides. We know a lot about traditional ABM systems, but we don't know a lot about such things as high-energy lasers, particle beams in space, pop-up systems, sensors, and what combination really would be effective and whether the two sides will choose the same systems. We may not. Another consideration is the timing—one side might have its systems ready for deployment at a different time than the other and that can cause problems. For these reasons, I do not think at this point it is possible for anybody to draw up a precise blueprint. And let me say frankly that this subject was studied to quite an extent during our policy studies within the government last summer. So it has been thought about by us and I know in the outside sector, too.

These are some ideas of potential arms control measures. They are speculative, as I say, and rather general, and we might want to discuss them further. One would be agreed schedules for introducing defensive systems for both sides. These schedules could be agreed upon either with treaties or tacitly. There are all sorts of ways of doing this. Another component would be associated schedules for reductions in ballistic missile forces. The idea here would be to phase in defenses and to try to phase down ballistic missile forces. If you did this in a reasonable way, it might make the transition more stable. To show you that not only the U.S. government has come up with this idea, Alvin Weinberg in the Spring *Foreign Policy* has a little article. He invented the idea independently down at Oak Ridge, and he has a different slant on it. But you can read about it there. There are some difficulties with that approach; for example, no one of has figured out yet what kind of units of account you

could use to get some kind of equality during the transition. You have kill probabilities, number of launchers, and so on. There are some real problems there if you're going to take that kind of approach.

Another possibility would be confidence-building measures and agreed rules of the road. Examples would be notifications that could be associated with the above schedules, implementation of ballistic missile defense systems, numbers, kinds, and so on. There would probably have to be agreed rules of the road if we had the kind of multi-tiered defense system that is envisioned as a possible end product in the U.S. Strategic Defense Initiative. To give an example, a ballistic missile defense system would not want to shoot down test and training launches or space launches of the other side, and we have to consider Third World launches too. But these are not impossible problems. They may be simpler in fact than SALT I, SALT II, and START in a way, but these are some of the things we would have to think about. But there would be ways, if the sides wanted to cooperate in such a transition, to try and enhance stability. Another thing would be measures to enhance the survivability of the ballistic missile defense systems of the two sides.

Let me, in this brief tour of the horizon, just mention briefly the question of non-proliferation—one that I suspect is going to be more pressing in the next 20 or 30 years than perhaps some of us realize—and what effect if any ballistic missile defenses would have there. It's hard to see the presence or absence of large scale U.S. or Soviet ballistic missile defenses as being the major factor concerning non-proliferation decisions in the Third World. The kinds of factors that would appear to be more first-order factors for Third World nations in deciding whether or not to go nuclear would be, first of all, their general perceptions about nuclear weapons and taboos about them, and perhaps, more importantly, regional threats and power balances and how the Third World nations would react to those. One more speculative idea is that it is possible that large-scale ballistic missile defenses by the U.S. could help discourage Third World nations from advanced stages of proliferation involving ballistic missiles. But it seems more likely that Third World countries would use as delivery systems, at least initially, either aircraft, in the case of some of the smaller parties, or even covert means of delivery for some of the nations that conduct or are involved in terrorist activities, and I guess we all know who they are.

Well, that concludes my remarks. Thank you.

Mr. Weinrod: Next is Dr. Keith Payne of the National Institute for Public Policy.

Dr. Payne: The most immediate issue concerning arms control and the

SDI concerns the ABM Treaty. Since Dr. Wollan went into that to some extent, I won't repeat what's been said, but just mention that the immediate objectives of the SDI as we know them certainly are not inconsistent with the ABM Treaty. A great deal of R&D is allowed by the Treaty. As a matter of fact, even a so-called exotic BMD system could be developed and tested if it were from a fixed ground based site at specified test ranges such as Kwajalein or White Sands. Perhaps a beam weapon could even be tested in the exo-atmosphere, given the U.S. definition of what space-based means, despite the prohibitions in Article 5 of the Treaty. So again, the point to reiterate is that the Strategic Defense Initiative's immediate objectives need not be in violation or inconsistent with continued adherence to the ABM Treaty. Of course, certain types of development and deployment, would, indeed, require revision and withdrawal as Dr. Wollan mentioned. I would like to talk briefly about the rationale for reconsidering the United States commitment to the terms of the ABM Treaty.

There are a number of good reasons for reconsidering the ABM Treaty even if revisions or withdrawal are not necessary at this point. I think that there are two very good reasons for beginning reconsideration of the ABM Treaty. First, there was a clear linkage between offensive force limitations and defensive force limitations established in 1972 in SALT I. It was clear in our minds at the time. For example, Unilateral Statement A in the ABM Treaty specifies a clear linkage between offensive force limitations and defensive force limitations. That linkage was sensible in terms of strategic logic. The Safeguard BMD system under deployment at the time (which was intended to defend ICBMs and possibly SAC bomber bases) could be limited if a cap could be placed on offensive systems, so that the Soviet threat to U.S. retaliatory forces could be limited. Pursuing offensive and defensive limitations was a sound approach to arms control at the time. In U.S. Unilateral Statement A of the Treaty, the United States specified that if further comprehensive limitations on offensive forces weren't achieved within five years—limitations that would limit and reduce the vulnerability of retaliatory U.S. forces—the United States would hold open the option of reconsidering its commitment to the ABM Treaty. The U.S. was holding out that option; it didn't say that it would withdraw from the treaty, but at least it was an option.

If we look at what has happened since 1972, it is clear that the conditions that were established by U.S. arms control policy for an uncritical continuing commitment to the ABM Treaty have not been met. Since 1972 there certainly has not been a more comprehensive limitation

on offensive arms. The arms control agreement that was achieved, SALT II, was not achieved within five years and did not provide for a limitation and reduction in the threat to retaliatory forces. That sound linkage that the U.S. carefully established at the time of SALT I has been broken. What we have seen since 1972 is a continuing increase in the threat to U.S. retaliatory forces and the maintenance of an ABM Treaty that prohibits our options for defending those forces. Strategic logic and previous arms control policy should lead us now to reconsider the ABM Treaty.

The Treaty should not be considered sacrosanct. The vulnerability of our forces at this time provides a good rationale for reconsidering the commitment to the Treaty. U.S. arms control policy at SALT I established a strict and clear linkage between offensive force reductions and defensive force limitations. The subsequent failure of offensive arms control provides a very clear rationale for reconsideration of the treaty. Those conditions that we established in 1972 have not been met; therefore the ABM Treaty should not be considered sacrosanct.

In the longer term, the linkage between the strategic defense initiative and arms control, I think, is very interesting. We often talk as if we are quite interested in deep force level reductions. By that I mean reductions beyond the sort of marginal adjustments to the strategic arms balance that arms control agreements tend to produce. The pursuit of deep force level reductions will in fact require strategic defense. A basis for deep force level reductions cannot exist in the absence of strategic defense; this is true for at least two reasons.

First, the United States approaches arms control with a fairly strict tendency to want a very good capability to monitor the provisions of an agreement—effective verification capabilities. Yet, precise verification of many qualitative and some quantitative factors of strategic forces is difficult or infeasible. One of the reasons we have been able to accept a degree of laxness in our ability to verify agreements precisely is because of the relatively high levels of weapons. It is generally thought that because of the large number of weapons, there are unlikely to be militarily useful violations that we could not monitor. Therefore we can accept a degree of ambiguity in our ability to monitor compliance.

But a deep force level reductions regime, one leading to a ceiling of perhaps 500 or even 1,000 launchers, could pose a significant verification problem. In the context of such low ceilings, even 100 covertly deployed weapons could make a significant military difference. Perhaps the only way to provide a solution to this problem is through strategic defense. Strategic defense could render acceptable the imprecise verification

capabilities that would otherwise derail any possibility for acceptable deep force level reductions. Strategic defense, given the U.S. perspective on verification, is extremely important if we ever really want to achieve deep force level reductions.

The need for strategic defense to support deep reductions also exists because of the Soviet Union's approach to arms control. If we have learned anything through the last twelve years of arms control negotiations, it is that the Soviet Union is very reluctant to restrict weapons that contribute well to Soviet military requirements. One of the reasons we see a great Soviet reluctance to move away from heavy ICBMs in arms control negotiations is because of the military requirement in the area of damage limitation. If we ever expect the Soviet Union to accept deep force level reductions in its offensive counterforce capabilities, there will have to be some kind of alternative means of damage limitation. Perhaps Soviet strategic defenses could provide that compensation in terms of damage-limiting capabilities and, at that point, deep force level reductions would cease being out of the question for the Soviet Union.

My point is that strategic defenses are not sufficient for the achievement of offensive deep force level reductions, but they will be necessary. They will provide a necessary basis for deep force level reductions if such reductions appear to be politically feasible.

In the course of negotiations we have also learned that the Soviet Union does not approach arms control from the Western perspective of stability, and that our previous understanding of the arms race was and remains inadequate. During the debate over the 1972 ABM Treaty, we heard absolutely confident predictions that the ballistic missile defense limitations would result in the Soviet Union calling an end to its offensive force buildup. That prediction was based upon the arms race model that many understood at the time: action and reaction. It became accepted wisdom that as long as the United States did not deploy ballistic missile defense, Soviet incentives to deploy additional offensive forces would evaporate and we both could go along happily with serious arms control limitations on offensive forces.

That understanding of the arms race, which was the key to our approach to SALT I, is inadequate if not totally wrong—I suspect it is inadequate as opposed to being wholly incorrect. The point is that to motivate the Soviet Union to engage in arms control and provide the possibility of a cooperative defensive transition, the Soviet Union has to see that arms control presents, in the net assessment, the most feasible means of meeting its particular military requirements. The United States is not going to be able to provide the basis for a cooperative defensive

transition by either ignoring offensive force modernization or by ignoring defensive force deployments. Visible momentum in both those areas will be necessary to give the Soviet Union an incentive to engage in a cooperative defense transition.

When we think about arms control and the strategic defense initiative, we should understand that signing an arms control agreement does not necessarily contribute to the objectives of arms control. Good arms control is that which supports the objectives of arms control. The classic understanding of the objectives of arms control include the following: to reduce the probability of war; to reduce the destructiveness should war occur; and to minimize the cost of maintaining an adequate military establishment. We tend to forget the objectives of arms control, and try to come up with agreements that are clever and perhaps negotiable, but not necessarily tied to the objectives of arms control in any coherent way.

In the long term, a greater commitment to strategic defense may be the only feasible way of serving the objectives of arms control. An examination of these objectives illustrates why I say that.

The first objective of arms control is to reduce the probability of war, often referred to as maintaining stability or enhancing stability. There is good reason to believe that defense can support deterrence stability. In the current era, we have come to understand deterrence stability only in terms of mutual vulnerability. Yet, deterrence stability is not necessarily synonymous with mutual vulnerability; I won't get into the details now—perhaps we can do so later in the question and answer period—of why strategic defense should indeed be able to support strategic stability. Let me give just one example, looking particularly at extended deterrence which has been perhaps the key reason why the United States deploys strategic forces.

U.S. policy has been that nuclear escalation, perhaps to the strategic central level, was a possible response to highly provocative Soviet actions such as invasion of Western Europe. In this particular policy the United States threatens, on behalf of distant allies, to engage in nuclear escalation, which ultimately could lead to scores of millions of casualties in the United States. In a situation in which the United States is threatening to engage in potentially self-destructive acts on behalf of distant allies, you have what logically would be an incredible (not believable) extended deterrent.

The French have thought for years that the U.S. nuclear umbrella is incredible. Some Soviet writings reflect the fact that this extended deterrent lacks credibility because the United States simply is unprepared to suffer the retaliation that would be forthcoming if it engaged in

nuclear escalation. Obviously, this is tied into the strategic defense initiative, because one way of making the Soviets perceive that the United States will be willing to abide by its extended deterrent commitments is for the United States to be more prepared to absorb the nuclear fire that the Soviet Union could inflict. If it is perceived that the United States would be more willing to abide by its treaty commitments in support of Western Europe, that should be stabilizing, if our understanding of stability and deterrence means anything.

Allow me to throw in a caveat at this point with regard to the notion of stability. Stability has become a word that means virtually nothing because it is used to support or criticize almost everything. A weapon system is described as both stabilizing and destabilzing simultaneously and, unless it is a schizophrenic weapon system, it probably is not both at the same time. If the truth be known, we have very little idea of what causes war. There is no consensus about what is the cause of war. There are some models and some hypotheses concerning war causation, but they lack acequate evidence to support a general theory of war causation.

Unfortunately, there is little clear guidance concerning what should be stabilizing or destabilizing. If one does not know what causes war, it is pretty hard to come up with a prescription for reducing its probability. It is like trying to fix your car when you have no idea of what makes it run—you do not know whether to beat on the tire or to go out and adjust the antenna. There exists a level of ignorance concerning war causation that very few people will admit; but there does not exist a clear idea, supported by persuasive evidence, of what is stabilizing or destabilizing. If our deterrence theory means anything—and we do not know with certainty whether deterrence ever has worked—strategic defense should be stabilizing. Nevertheless, that prediction should be taken with a grain of salt because of the level of ignorance concerning war causation, an ignorance that most policy analysts will not acknowledge.

The fact that we cannot be confident about what is and what is not stabilizing should lead us to be seriously concerned about the second goal of arms control (i.e. reducing the level of damage should war occur). If we cannot be confident that we know what we are doing in terms of reducing the probability of war, we ought to be better prepared for the possibility that deterrence may not exist or may fail. If you examine the possible measures for reducing the destructiveness of nuclear war should it occur, strategic defense strikes me as the only feasible means. Other measures often proposed—nuclear disarmament and world government have been two favorites of late—are out of the bounds of what is politically realistic, at least within our lifetimes.

Let me summarize with the three points I have tried to make: First, the strategic defense initiative is not inconsistent with the ABM Treaty—it need not be. Second, the ABM Treaty should not be considered sacrosanct, and we should reaffirm the offensive-defensive linkage that we established in 1972. Third, strategic defense may indeed be necessary, if not sufficient, for deep force-level reductions and for supporting the classic goals of arms control in the long run.

Mr. Weinrod: Thank you very much Keith. Our final panelist in this panel is Joseph Mayer, a professional staff member of the Senate Select Committee on Intelligence.

Mr. Mayer: Until recently, the congressional debate on strategic defense could be described as something akin to Sherlock Holmes's reference to the curious incident of the dog in the night. "But the dog did nothing in the night," was the reply. That, said Holmes, "was the curious incident." And so it has been with the Congress.

The debate on strategic defense has been notable only by its absence. For all intents and purposes, the issue has been off the congressional agenda since the ratification of the ABM Treaty in 1972. It did raise its head somewhat in 1976, unfortunately for the wrong reasons, when the decision was made to unilaterally dismantle our one ABM site allowed under the terms of the agreement.

Since that time, the strategic defense debate essentially has ceased to exist, and funding for research and development programs in this area has been lacking seriously in comparison to Soviet efforts. This was never intended to be, despite the impression promoted by the arms control community that, in 1972, the U.S. pledged to abandon forever even the thought of providing any defense against a Soviet nuclear attack.

In this regard, we should consider two points: First, while the ABM Treaty is of unlimited duration, it does provide for periodic five-year reviews in order that the parties might judge its continuing merit and contribution to nuclear stability. Second, at the time the Treaty was being negotiated, the U.S. explicitly linked the agreement on defensive systems to further achievement of restriction on offensive forces.

As Keith has already pointed out, the U.S. made the following unilateral statement in May 1972: "If an agreement providing for more comprehensive strategic offensive arms limitation were not achieved within five years, U.S. supreme interests could be jeopardized." The spirit of that statement was endorsed by the Congress when it adopted the Jackson Amendment as part of Public Law 92-448, providing for approval of the SALT I accord.

President Reagan's so-called Star Wars speech of March, 1983 has

galvanized public and congressional attention on the subject of strategic defense and its potential role to reduce our dependence on offensive nuclear forces and to promote the goal of increased stability in the nuclear age. In fact, the liberal arms control community has elevated the effort to stop the U.S. ASAT and ballistic missile defense (BMD) programs as only second in importance to blocking the MX and imposing some form of nuclear freeze or moratorium. The fiscal year 1985 budget request to implement the President's Strategic Defense Initiative provides the basis for detailed technical and cost evaluations of the program, but many key issues dealing with arms control and nuclear stability transcend these more technical considerations and play a major part in the congressional debate.

Several weeks ago Carey Lord wrote an article in the *Wall Street Journal* entitled "An Arms Control Craving." Carey noted that the congressional enthusiasm for arms control seems "remarkably untempered" by the failed record of the past decade. He's absolutely right. In January of this year, President Reagan reported to the Congress on the subject of Soviet non-compliance with arms control agreements. One conclusion of that report was that the construction of a new radar in the interior of the Soviet Union almost certainly constitutes a violation of the ABM Treaty in that its siting, orientation, and capability are not in accordance with the provisions of that agreement. The response of the Congress was that "While this is certainly a matter of some concern and, yes, we must pursue this issue quietly through diplomatic channels, please let's not sidetrack our commitment to redouble our efforts to achieve more and better arms control."

In fact, some two months after receipt of the Soviet non-compliance report, Senator Pressler introduced an amendment to an urgent supplemental appropriations bill that would have, if it had been enacted, had far-reaching consequences in hampering the U.S. ASAT and ballistic missile defense programs.

Congressional objections to ballistic missile defense, and specifically to the President's Strategic Defense Initiative, center on four basic points. First, it is charged that the system will never work. This criticism is premature at best. The Administration's program is intended to research the technologies involved in order to put us in a position to make an informed decision about proceeding with deployment. The critics would like to preempt this research program.

The charge that the system will not work also assumes a requirement for 100 percent effectiveness. Unfortunately, various statements by Administration officials encourage this kind of thinking by their refer-

ences to impregnable defenses. Secretary Weinberger's recent speech before the National Press Club, in which he spoke of intermediate measures that could, for example, provide protection for our offensive deterrence forces, has helped to move the debate in the more fruitful direction of the merits of more limited defenses. The fact is that the defense does not have to be 100 percent effective to be beneficial.

Second, it is said that a defensive system will cost too much. Again the criticism is premature. Certainly, the five-year budget for the Strategic Defense Initiative is not too burdensome. We are talking about $25 to $26 billion—$18 billion of which had already been projected prior to the President's speech in 1983. And again, until we know what kind of a system might be deployed, it seems premature to charge that the system will be too expensive.

Third, it is said that deployment of a ballistic missile defense will undermine the ABM Treaty, which is often characterized as the most successful arms control agreement. Yet, as we have already noted, the Treaty allows for periodic review in order that changes in the strategic relationship between the U.S. and the Soviet Union can be considered. Amendments to the Treaty, as well as withdrawal from it, are options both parties are entitled to exercise. Finally, we must remind ourselves that arms control is intended to promote U.S. security and nuclear stability. It seems fair, therefore, to ask whether, in light of the continued Soviet offensive build-up, continued restrictions on defensive systems are consistent with security or stability.

Fourth, the charge is made that the President's program will prompt a defensive arms race and promote a further increase in offensive forces. This criticism might make more sense if we did not have 12 years experience with the ABM Treaty. The fact is that the ABM Treaty did not put a halt to a defensive arms race, it merely took one of the participants—the U.S.—out of the race. With respect to offensive forces, it is difficult to see what more the Soviets would have done in building up their offensive arsenal in the absence of the ABM Treaty—yet the Treaty was specifically intended to remove any incentive for the Soviets to deploy a force that could pose a first-strike threat to our deterrent.

For the sake of discussion, let's imagine that the U.S. deploys a layered ballistic missile defense system. What would be the implication for arms control and stability? A layered defense, which could neutralize a portion of Soviet ICBMs during the early boost phase of attack, would provide strong incentive for the Soviets to restructure their forces with far less emphasis on destabilizing MIRVed land-based missile systems. This would complement U.S. arms control proposals which are intended to

promote stability by encouraging mobile, more survivable, single warhead missiles.

This stabilizing force-structure change is more likely to be achieved by deploying defensive systems which significantly reduce the effectiveness of Soviet MIRVed ICBMs than by engaging in intellectual arms control discussions with the Soviets on the merits of single warhead missiles. In addition, it would have the salutory effect of providing some measure of defense for our deterrent forces, particularly our ICBMs, which today are increasingly vulnerable.

The Soviets are not misguided school children in need of patient U.S. efforts to educate them on the realities of nuclear stability, nor are they Paul Warnke's "apes on a treadmill" merely reacting to U.S. programs. Both proponents and opponents of strategic defense in the Congress would do well to keep this in mind as the debate on the issue of strategic defense continues over the next year or so. Thank you.

Mr. Weinrod: Thank you Joe, and thank all of you for very enlightening comments. I now would like to open the floor to questions.

Tom Krebs, High Frontier: Some people suggest that besides having a ballistic missile defense, we might have an air defense against, say, cruise missiles and bombers. If we had not only reasonably effective BMD, but also a reasonably effective air defense, others suggest that perhaps we could not only get the deep reductions, but essentially make those systems totally obsolete. I would like to hear your opinions on that kind of approach.

Dr. Lord: I did not quite understand the question. Which systems would be made totally obsolete—ballistic missiles or . . . ?

Mr. Krebs: Let us assume that ballistic missiles and air delivery vehicles of nuclear weapons would essentially be made obsolete. Not a 100 percent defense, but a 90-95 percent, something like this. We've talked about reductions. We have even talked about deep reductions, but some people would say make them so ineffective that basically we would go back to conventional weapons.

Dr. Lord: I think one interesting aspect of that question is the air defense and the future of the bomber and the cruise missile. I think one could certainly argue that there is a good prospect, given the existence of Stealth technologies[6] on the horizon, that there really would be a shift

[6]Stealth technologies are designed to make detection of bombers and cruise missiles by radar more difficult. They include the reduction of emissions such as infrared from engine exhaust, the use of radar-absorbent camouflage paint schemes, and the reduction of radar reflections from the aircraft by eliminating right-angles in the airframe and avoiding large areas of flat metal sheet.

away from ballistic missiles back toward air-breathing systems—that the penetrability of air-breathing systems might actually, in the relatively long-term, be superior to that of ballistic missiles. So that would be the first point. I guess the further point would be, and this is what your question seems to get at, is there could be a return to emphasis on conventional defense or conventional forces as opposed to nuclear weapons altogether. It is a complicated question, but I think it is raised by the whole strategic defense idea, and that is something that I think we have got to begin to think about.

Dr. Payne: For several reasons, I do not believe that strategic nuclear offensive weapons are going to be obsolete even if we have an extremely effective strategic defense capability. The first is because I doubt that either the Soviet Union or the United States are going to completely strip themselves of the ability to deter other countries through the threat of nuclear escalation. I am certain that the Soviet Union will not strip itself of a nuclear capability against the Chinese, for example. We do not know what nuclear proliferation (horizontal or vertical) will take place over the next 20 to 40 years. We do not even know which nuclear-armed powers we may need to deter in the coming decades. A second reason involves not just third party coercion, third party deterrence if you will, but the need for offensive forces to backstop strategic defense in the event we discover technical flaws as the defensive regimes develop. You see some of this type of backstopping in our effort to maintain a triad. Obviously the rationale is to maintain a capability in case flaws develop in any particular leg of the triad. Strategic offensive forces are going to remain necessary to provide this same type of backstop for strategic defensive forces as they develop. There is not going to be any end point in this measure/counter-measure, offensive-defensive relationship. I suspect this idea that strategic offensive forces will become obsolete is wrong, given the fact that there will have to be some backstop for deterrence purposes for strategic defensive forces, and because history teaches that there is never an endpoint in the offensive-defensive competition, and finally because of the possibility that measure/counter-measure might lead to very ineffective strategic defenses at some point.

Mr. Mayer: I would agree with Keith. I do not think there is anything absolute in these discussions with respect to eliminating the need for offensive nuclear forces. Indeed, I think the proponents of strategic defense trip themselves up and provide ammunition for the opponents when they talk about eliminating the need for offensive forces. I think we ought to view this issue in terms of what can complement our offensive forces and reduce, to a certain extent, our dependence on those forces.

Talking about eliminating the need for an offensive nuclear deterrent is impractical because it won't ever come to pass, for the reasons that Keith has pointed out, and it's a tactical mistake for those who would like to promote strategic defense.

Chris Lay: I am Chris Lay of the Arms Control and Disarmament Agency. Joe Mayer, in his presentation of a boost-phase ballistic missile defense, presented a case where strategic defense had a positive arms control effect. I would like to ask any of the panelists to comment. Do any of you see, for example, terminal-phase or mid-course intercept systems as also having some arms control benefit?

Dr. Payne: If one examines the history of the SALT negotiations, it is clear that one of the major dynamics behind the agreements that were achieved in 1972 was the existence of the Safeguard BMD program which had a terminal defense intercept potential. I do indeed think that terminal defense should be encouraging for arms control now for the same reasons that it was encouraging for arms control in the past. We should examine the terminal defense regime, as you mentioned, and consider what are the implications for arms control. Given the experience of earlier negotiations, I think terminal defenses could be quite helpful for arms control. One of the reasons that the Soviet Union appears to have concentrated so heavily on the heavy ICBMs is for the purpose of holding at risk American ICBM forces and other hardened point targets. If those forces can be defended even moderately,the continued Soviet accumulation of heavy ICBMs will be rendered more or less fruitless; that should give the Soviet Union an incentive (or at least reduce the disincentives) to draw down those forces. In that case we might be able to reach that point we have been trying to achieve for a long time, and that is to get the Soviet Union to draw down its ICBMs.

Dr. Wollan: I would like to add something too. Many of the comments here about ballistic missile defense are generic to the concept, can you do it or not, and if you can, how well. One of the ideas underlying the whole Strategic Defense Initiative is the idea of layered defense, or defense in depth. And to that extent, all the layers contribute. Let me just give you a simple example. Most people who deal with real physical systems, in the laboratory or out in the field, know that it is very difficult to make anything work 99.9 percent effectively. But it might be possible to make individual layers of defense work 90 percent effectively. If you have three layers of that, that amounts to 99.9 percent effectiveness. Now, nobody's saying that we can do 90 percent, but the point is that if you have a layered system, at least conceptually, you have the possibility of thinning things out using different discriminants, forcing them to go to different,

more expensive countermeasures. If you want to think about a very effective ballistic missile defense, you probably would want to think about a multi-layered system. So in that sense, all the different layers would contribute their part.

Mr. Mayer: What I would like to do is reemphasize the point concerning the ultimate objectives of arms control and strategic defense. We're not looking to deploy a strategic defense system in order that we can promote *per se* another arms control agreement, either offensive or defensive. That, we hope, would be one of the outcomes. What we are trying to do is get to a situation where the strategic relationship between the United States and the Soviet Union lends itself to greater stability—accepting Keith's caveat about what is stability and what causes it and what causes its breakdown. And in that respect, a layered defense gets us away from the destabilizing situation we find ourselves in today where U.S. forces are becoming, or already are, vulnerable to attack. So I think we have to link up strategic defense not so much with how it gets us from here to there on arms control, but how does it get us from here to there on what is stabilizing and what is good for national security.

Tom Krebs: Dr. Wollan, you said you thought that any kind of arms control agreement would have some kind of considerable restrictions on the amount of defense one might have.

Dr. Wollan: I said that the current ABM Treaty does that.

Tom Krebs: Okay, I understood you to say that any new arms control approach in the era of strategic defense would put restrictions not on our offensive forces, but also on the defensive forces. Was I incorrect there?

Dr. Wollan: I am not sure I said that, but if I gave that impression, I did not mean to. What I was saying was, and this is pretty vague at this point, is that it might be possible to have some kind of limitations on offensive forces in a defensive-oriented regime, and perhaps some limitations or some qualitative limitations on ballistic missile defenses. But clearly, if it's a defense-dominant regime, defense is going to be largely unlimited. You may want to do certain things that may help stability—I guess I do not have an example, it's just sort of a general concept at this point.

Tom Krebs: It seems to me the arms control approaches here are really keyed to, say, public acceptance of this whole concept. And could you tell us just what is being done within ACDA to of "get our house together" on this whole issue?

Dr. Wollan: Well, the government is studying this point as it has previously. I cannot say anything specifically. Part of it has to do with the time scale, and this is quite a way downstream. We're just beginning to get going on this. We did something last summer in the NSSD 6-83

exercise, which was the study done in response to the President's speech. To be frank, we have not gone much beyond the level of generality that I have told you, and for the reasons I gave—namely it is hard to know what the exact scenario is. I think a lot of this is at a very embryonic stage; the arms control perhaps even more so than the technology. But there are a lot of questions that arise. One of them is that if nuclear weapons are relatively decreased, then it may place more of a burden on U.S. conventional forces that deter Soviet adventurism, assuming that they do not become nice guys. And that runs against what our policy basically has been since the 1950s. So if you see us evolving over decades, we'll have to do things to our conventional forces, too. That's a military question, not an arms control question. So I see us as moving, over a period of half decades, or decades, on this. A lot of this is pretty embryonic.

Mickey Krebs, High Frontier: Is there any reason that right now, for instance, when the Soviets walked away, we could not bring them back to the table for a reconsideration and tell them that we want to reconsider this ABM Treaty? Then, maybe it is too naive to say this, but we could say, "Well, maybe the reason why we should reconsider this is that we possibly are beginning to resurge and we intend to build up a defensive program," which they are, from all indication, also doing. We could say that the reason for it was because of the danger of Third World parties entering into this race—approach it from an objective like that. In other words, could we use this as an incentive to get them back to the negotiating table?

Dr. Wollan: You mean in START for example, the offensive arms?

Mickey Krebs: Yes. It seems to me that we're going about this and we're doing all the research on this thing, and then maybe we'll build it and then we are wondering—if we build it, are they going to react to it? Why not just put it on the table and say that obviously we see a need for a strategic defensive system? They seem to be going forward already with the radar and two-layered system they set up near Moscow anyway. All I am saying is that, rather than wondering what's going on and have them wondering what is going, should we not we bring this up at the arms talks and lay it out before them. But not giving away all our secrets, or anything like that.

Dr. Wollan: I am not quite sure what the question is. With respect to ballistic missile defenses, the ABM Treaty is a treaty of infinite duration. So we do not have to negotiate with them at this time on those limitations. And in fact, the Strategic Defense Initiative through the 1980s is consistent with that. So we do not have to change the treaty now. I would argue that since we are not ready to deploy, it is probably in our interest to

hold their feet to the fire on this until such a time as it might be in our interest to change. Now as far as letting the Soviets know what happens, there's a high asymmetry here. I do not need to tell this audience of the amount of information the U.S. government gives its people. And my burgeoning files tell me that the Strategic Defense Initiative is a special example of this. There is a lot of information coming out in quite a bit of detail. And I assume that the Soviets all over this Hill are picking up unclassified, freely given stuff on what our program is. So they're going to know what it is we're up to. The real question is, do we have to talk about this? Now, we do have a forum for discussing this. In particular, one which I can't discuss, the Standing Consultative Commission whose proceedings are confidential, but one might imagine the Soviets could bring that up if they wanted to. But they do not really have to because they can find out more or less what's going on this from just from our open system.

Mickey Krebs: Even if they already know that, obviously they know this course that we are getting prepared possibly to take.

Dr. Wollan: But they also know the state of it, too. And they know it's not going to happen next year. The final point I think was the question of our leverage in START on this. That can play several ways. And I frankly do not think either we or they have really thought through exactly how that's going to work out in the near term. If things change from offense-dominant through a transition to defense-dominant over 20 or 30 years, things are changing fairly rapidly. So that means until ballistic missile defenses come in, you could, if you wanted to, go on with the traditional strategic arms limitations approach, which the Administration is doing with START. If you begin to move to a transition at some point, then you're going to have to take a rather different approach.

Guest from Congressman Hightower's office: I would like to get away from the technical aspects and focus on the political at this point. As everybody here knows, there are a lot of political players—some elements at the Pentagon are scared to death of the SDI and its limitations, and that it will take money out of their particular programs. So they may not be enthusiastic about it. We know the arms control community is very upset about the SDI and the elements of it. What I would like is your assessment of any or all elements of the general political debate. My grave concern is that we're getting ready to stone the SDI to death over the next five years and then the Administration is going to change and nothing's going to happen. Or critics will come back to the Congress and will say "Look, we've spent $26 billion over five years and all they've got is mountains and mountains of paper and we still haven't deployed any-

thing." All this amounts to a boondoggle for the Pentagon and the arms contractors. What is your impression of the overall politics of the situation, and do you think that BMD for this country is ever going to be built in the next 15 to 20 years?

Mr. Mayer: Obviously there's a good deal of politics involved and various actors are waging the battle in terms of their own particular perspective. I share some of your concerns. I know some of my colleagues who are strong proponents of strategic defense share some of your concern that we're going to end up after five years, having spent $26 billion, and not be in a much better position to know what we're going to do until we go another five years and spend another $26 billion. The concern is that this is one way for various people to stretch this thing out so that we won't ever be in a position to make a decision.

But in spite of this concern, we have got to be in a position to make an informed decision. I would love to forge ahead with a strategic defense program, and set a date for deployment that coincides with the MX program in order to provide a limited strategic defense capability that could even be done within the constraints of the ABM Treaty. But I also think we have to make sure we're on solid ground before we forge ahead here. We have to be sensitive to conflicting views, but I think it's incumbent upon the proponents of defense in the Congress to ensure that we're not going to just dilly-dally along here for the next 20 years spending money and never reaching a decision.

Juliana Pilon, Heritage Foundation: Dr. Wollan, you mentioned the possibility of reconsidering the Outer Space Treaty. Could you talk about which aspect and why?

Dr. Wollan: This is one I think people are less enthusiastic about reconsidering than others for some fundamental reasons. People have mentioned the possibility of X-ray lasers in space which would be nuclear-explosion-driven. And that would require revision of the Outer Space Treaty. That is not a happy prospect for a number of reasons. The Outer Space Treaty is part of the whole constitution of outer space. And there are all sorts of issues in terms of space law, and in terms of satellites and commercial use of space and so on. I think before one wanted to open up that issue, you would have to take a look at our whole space policy. So I was not proposing it, but I was saying that it is an issue that might come up. But I think that would be more controversial and more delicate even than the ABM Treaty.

Mr. Weinrod: We want to thank you very much for a very good discussion of the arms control aspects of strategic defense.

Panel 4

The Transition from Strategic Offense to Strategic Defense

Panelists:
Colin Gray, National Institute for Public Policy
Robert Pfaltzgraff, Fletcher School of Law and Diplomacy, Institute for Foreign Policy Analysis
Thomas Blau

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The Louis Lehrman Auditorium
The Heritage Foundation

Bruce Weinrod: Welcome to the second panel this afternoon on Strategic Defense. The first panel, as you know, discussed the arms control aspects or implications of strategic defense. In that discussion, as well as the ones in the first week, there were a number of references made to the question of the transition from our current posture, relying primarily on offensive weapons systems, to a situation in which reliance would be primarily if not exclusively on defensive weapons systems. A number of questions have been raised about such a transition. Some people have argued that you simply cannot get from here to there. Others have said that the difficulties in doing that would be much greater than any benefits to be gained from the end result.

To begin the discussion, we are very pleased to have Dr. Colin Gray, who is President of the National Institute for Public Policy, and a member of the General Advisory Commission of the Arms Control and Disarmament Agency.

Dr. Gray: The goals of the strategic defense initiative (SDI) have been variously identified. The President has said very little, indeed much too little, on the SDI since his speech on March 23, 1983. A perception has grown that what began as a vision of a world free of nuclear threat by ballistic missiles, has been attributed by official skeptics to a focus upon the support of the familiar, offensive-dominant nuclear deterrence system that we have known for so long.

For whatever reasons, there is no doubt that some important elements in the Congress are dissatisfied with the policy and strategy story that they have seen thus far. There are, of course, many people who will oppose the SDI regardless of elegance in policy rationales and even regardless of the prospects for technological accomplishment. Their position is that they don't believe the technology will work, but that even if it did work, they don't want it. To those people I have nothing to say. However, I believe that there is a large potential constituency in the country and in Congress for strategic defense, provided the technology and the policy stories are plausible.

By and large the SDI is receiving a bad press at the present time. A person who attended to SDI issues only through media reports could be excused for believing that: (1) the Administration does not know what it wants to achieve; (2) wildly improbable expectations are being touted by officials for near-perfect spaced-based defenses; (3) the consequences of our proceeding with the SDI for arms race and crisis stability are being ignored; (4) what little remains of strategic arms control will be sacrificed (and not for compelling reasons); and, (5) the SDI and a defensive

transition may even be very dangerous. In short, the SDI is in very serious trouble.

I am going to proceed by posing, and seeking to answer, four complex central questions about a defensive transition:

(1) What do we mean by a defensive transition? What are its goals?

(2) What changes in doctrine and policy would a defensive transition require?

(3) What would be the impact of a defensive transition on arms race and crisis stability?

(4) What would be the roles of strategic offensive forces during, and beyond, a defensive transition?

(1) *What do we mean by a defensive transition? What are its goals?*

Logically, there is no tension between the near- and far-term goals of a defensive transition. One is not subverting the President's vision by saying that in the 1990s we will do what we can do at that time, which should amount to increasing greatly the uncertainties for Soviet attack-planners, while we proceed to work on the technologies for boost and post-boost phase defense that may serve as the basis for nationwide defense. The SDI is a commitment to explore what may be possible, no more and no less. We know that we can provide a useful level of active defense of hardened military and command assets in the near-term—that is not very controversial. What is more, by way of a point that is frequently overlooked, the near- term active defense of strategic forces and C^3 must work to guard further steps in a defensive transition.

Our long-term goal is to effect the functional disarmament of Soviet long-range nuclear forces—a goal which implies a transformation in the terms of deterrence, not the transcending of deterrence altogether. No one knows today what degree of city protection we may be able to enforce, by what date, with precisely which weapons, or at what dollar cost. But we do know that the goal is politically, morally and strategically necessary and, more practically, we do know that strategic defensive weaponry is vastly immature vis-à-vis strategic offensive weaponry. This should mean—to a reasonable person—that the growth potential for defensive competence should be far greater than the potential for the offense.

By way of broad outline, it is possible, and necessary, to sketch a road map for the SDI and a defensive transition. In its first decade, to 1995, the SDI should develop the means to protect the offensive forces that will guard what may become a defensive transition. In its second decade, to 2005, the SDI should develop, test and perhaps begin to deploy, weapons capable of imposing truly massive attrition upon Soviet offensive forces.

Whether or not the Soviets will choose to cooperate with our SDI intentions must depend upon: (1) the general political climate of East-West relations, and (2) their calculation of how well they are likely to do in a complex offense-defense competition that is legally unregulated.

As a contingent prediction, I would say that the Soviets will agree to a very large, START-regulated draw-down in their offensive arsenal only if they believe that is the only chance they have to avoid being placed at a major military disadvantage. The theorists and officials who are saying today that the SDI can prosper only within an arms control regime are simply wrong. A disarmament regime obviously would help a defensive transition, but we will have to earn such a regime. The only way the U.S. can earn such a regime is by fielding offensive forces that the Soviets believe will defeat their defenses, and by fielding defensive forces that, again, the Soviets believe will keep Soviet missile warheads out of North America.

I am going along with popular usage in referring to a defensive transition. But it should be understood that, in important respects, we are talking about a defensive addition, as well as transition, while the strategic balance will always be in a state of transition. The strategic arms competition will be solved by war or by political agreement, not by technology. If, sometime in the next century, we achieve a condition of "walled city" superpowers, that is to say superpowers with mature defensive transitions, there will then be debate over an offensive transition. The dynamic between offense and defense will not stop.

(2) *What changes in doctrine and policy would a defensive transition require?*

For the near-term, so long as the U.S. was seeking only to protect forces and command architecture, no change in doctrine or policy would be required. However, it would be necessary to renegotiate, or withdraw from, the ABM Treaty. A price we would pay for that, of course, would be additional important difficulties for our weapon designers and operators, who would have to contend with dedicated Soviet BMD deployments.

Looking to the far-term, mature defensive transitions have major implications for the structure of our doctrine and policy. Whatever you may believe about the credibility of our current strategic policy, and the technical suitability of its military means, it is a fact that U.S. strategic offensive forces play a vital role in U.S. and NATO defense policy. If the superpowers could not reliably do each other very much damage at home, that would be a very different strategic world from the world familiar today.

If we presume that East-West antipathy will persist over the next several decades, then we must recognize that the functional disarmament of strategic offensive forces provides a novel problem. How does deterrence work in a world of sanctuary superpowers? Possible answers include the following: (1) fear of local defeat or stalemate by Western conventional (and battlefield nuclear) forces; (2) fear of catastrophic failure due to heavy leakage through strategic defenses; and, (3) fear of Western defense-industrial mobilization (a process protected at home by defenses).

The weight of the deterrence burden placed on non-nuclear forces obviously would depend upon the balance of advantage in strategic forces. It is possible that U.S. offensive-force modernization, married to a defensive addition of many layers, would restore a great measure of the first-use credibility that our strategic forces have lost since the late 1960s.

However, U.S. doctrine in the context of an evolving defensive transition, should be guided by two overriding principles:

(a) For the near-term, enhance the pre-launch survivability of U.S. strategic forces, even at the cost of their having new penetration problems (because of Soviet strategic defenses).

(b) For the longer-term, defend Americans rather than threaten Russians. If we can do both very competently, fine. If we cannot, we should offer the Soviets a deal whereby we foreclose on our ability to do them much damage at home, in return for them reducing their challenge to our defenses.

(3) *What would be the impact of a defensive transition on arms race and crisis stability?*

Let there be no illusions on this score—the Soviet Union will try to discourage us from proceeding with the SDI, let alone with a defensive transition. In fact, if our SDI does not "stimulate the arms race," as the saying goes, I would be worried. Our SDI is intended, near- and far-term, to defeat Soviet strategy—they have every incentive to try to thwart us. Fashionable opinion notwithstanding, there is nothing inherently destabilizing about technological change *per se*. On the contrary, a rapid rate of technology evolution means that tommorrow always looks more suitable for a showdown than does today.

The defensive transition will enhance stability, in the first instance, by protecting our familiar nuclear means of retaliation. Some critics would have us believe that a defensive transition will, at worst, invite a nuclear ambush—as the Soviets move to arrest our transition—or, at best, will greatly increase first- strike pressure in time of crisis. I wish I had those critics in my graduate class at Georgetown.

The Soviet Union will not start a war in order to prevent our defensive transition from maturing because we will retain and modernize large and capable offensive forces. Even if the strategic balance looks worse for the Soviets tomorrow than it does today, they will have no plausible theory of victory for "today." Also, I must add, the Soviet Union need never be in a truly desperate situation. It will have the option of offering the U.S. a START deal that we could not refuse; and it will hope for growing competence in its own defenses. Why choose a certain nuclear war today that cannot be won, when the adverse character of the strategic balance can be mitigated tomorrow?

How is it that the SDI is supposed to promote crisis instability? The Mad Hatter logic holds that strategic defenses must work better against a retaliatory"second strike" than against a first strike—therefore, realization of the first strike-bonus will make both superpowers quicker on the trigger to preempt. We can stop this argument dead in its absurd tracks with two observations: (1) strategic defenses sufficiently menacing as to trigger a nuclear war should, surely, be sufficiently menacing as to raise the profoundest doubts about the prospects of success for the first striker; and, (2) even if it is true that defenses should work better against a "ragged remainder" kind of second strike than against a coordinated massive first strike, on what basis should it be assumed that a Soviet attacker would believe he would do well enough, going first, to avoid defeat?

(4) *What would be the roles of strategic offensive forces during, and beyond, a defensive transition?*

In summary form, the roles of offensive forces would be the following:

- To guard the transition, and provide insurance against the rather distant possibility that Soviet leaders might reason like some of our American critics of the SDI, and choose war today rather than a mature U.S. defensive transition tomorrow.
- To provide essential leverage to motivate the Soviet Union to negotiate force reductions that would assist the U.S. defensive transition.
- To provide a hedge against the SDI being arrested for technological, political or strategic reasons. We are not going to discard a deterrent that we know works in favor of one that might work, without a long shake-down period for the new systems.
- To provide a "make weight" deterrence and help stabilize a defense-defense competition. Given the geostrategic disadvantages of the

U.S. around the periphery of Eurasia, it is desirable that the Soviets should always fear substantial leakage through their strategic defenses.

- To provide an operational and technology base to sustain offensive possibilities in the strategic competition. To keep our defenses in good order we must have state-of-the-art knowledge of the offense—and neither the U.S. nor the Soviet Union will want totally to abandon the prospect of inflicting major damage upon the other.
- Finally, to intimidate or to punish third parties. The Soviets will never forego the ability to threaten China with nuclear weapons.

Let me conclude with the thought that we should be intensely skeptical of anybody who asserts with high confidence in 1984 what we will not be able to do 20 or 30 years from now.

Mr. Weinrod: Our second speaker today is Dr. Robert Pfaltzgraff who is the Shelby Cullom Davis Professor of International Security Studies at the Fletcher School at Tufts University and President of the Institute for Foreign Policy Analysis.

Dr. Pfaltzgraff: More than a decade ago, at the time of the signing of the ABM Treaty in 1972, several arguments were advanced in support of effective limitations on strategic defense:

- Deployment of a strategic defense to protect an ICBM force would only encourage the Soviet Union to build more offensive strategic forces. Without a U.S. ABM, the Soviet Union might have less incentive to build larger offensive strategic forces.
- Abandoning technologies for strategic defense by the United States—technologies in which we were ahead of the Soviet Union—would demonstrate more than a symbolic departure from a new era in armaments competiton.
- In any event, it was argued, the technical problems were so formidable that a ballistic missile defense system was not feasible.
- Finally, the United States, it was contended, should seek an arms control agreement in which both offensive and defensive strategic forces were sharply limited. In restrospect, the failure of SALT to achieve such an objective represents one of its fatal flaws. We got severe restrictions on strategic defense without effective constraints on offensive forces, with attendant consequences for the strategic nuclear balance and heightened potential for instability.

By the beginning of the 1980s, the results of the experience of a decade of SALT, together with mounting evidence that the Soviet Union does not

share with the U.S. a concept of mutual deterrence based upon the holding of population centers in a hostage relationship, contributed to a reassessment of the potential role of strategic defense. Similarly, advances in technology held greater promise for strategic defense. The view has gained currency that strategic deterrence should be based not so much on the vulnerability of adversaries to destruction, but instead on the notion that neither can be certain of destroying the other—deterrence based not on assured destruction but instead on assured, or at least enhanced, survival. In addition to technical feasibility, the essential question is how to manage a transition from the existing strategic role in deterrence. To ask this question, in turn, is to address necessarily several other issues of fundamental importance. They include:

Do we seek a "point" or an "area" defense, for which the requirements are fundamentally different? It is far more difficult, and perhaps technically impossible, to achieve a strategic defense that is 100 percent effective. To abandon strategic defense as a concept because it may not be total may be as foolhardy as it would be to argue that a total strategic defense is possible. The answer to this question must be provided by the technical community. President Reagan has called for studies to assess the technical feasibility of various forms of strategic defense. It is plausible to suggest that strategic defense, in conjunction with other protective measures, such as hardening of defended targets, may provide an important contribution to deterrence by enhancing the survivability of those military assets that an attacker would need to destroy to be certain of military victory.

Closely related is the question of the technological relationship between the offense and defense. At the time of the ABM Treaty, it was assumed that it would be less costly to build additional offensive forces to overwhelm a strategic defense than it would be to construct the means to defend against such an attack. If all the evidence about this offense-defense ratio is not yet available, it is not preordained by any means that offensive forces will always be able to prevail over the defense.

Much of the discussion of the Strategic Defense Initiative takes place in a context that assumes a reactive posture on the part of the Soviet Union. Although Soviet behavior would undoubtedly be affected by a U.S. decision to deploy a form of strategic defense in accordance with a specified timetable—say five or ten years—the Soviet Union has its own strategic defense R&D program whose relationship to anything the United States might or might not do is uncertain. The Soviet Union has at least pressed the limits of the ABM Treaty, and even appears to be in violation of the Treaty in the building, for example, of radar complexes

that seem to have as their principal function battle management in a strategic defense context. Fears have been voiced that the Soviet Union is preparing eventually to break out of the ABM Treaty.

In addition to extensive air defenses, the Soviet Union has deployed around Moscow the world's only operational ABM system. Its purpose is to furnish protection for Soviet political leadership and military command authorities in a nuclear war. This ABM system is being upgraded and expanded within the limits of the ABM Treaty. Paradoxically, the incentive for the Soviet Union to break out of the ABM Treaty would be heightened by the lack of an American R&D program that furnished a capability on our part to respond in kind. This was a part of the rationale for a modest American R&D program in the decade after the ratification of the ABM Treaty. More plausible than the question of what will be the Soviet reaction to the American Strategic Defense Initiative is: What is the Soviet Union likely to do, given its present strategic defense program, in the absence of an American strategic defense initiative? The pace and scope of Soviet strategic defense programs lead to a fundamentally important question: What would be the implications for strategic stability of a decision by the Soviet Union in the late 1980s to break out of the ABM Treaty, under conditions in which the United States could not reply in kind.

To address questions about a transition to strategic defense, then, depends upon a greater degree of certainty than we now have about the technologies that will be available, their effectiveness, their cost, and approximately when they could be deployed. It would be prudent to assume that, at best, the United States could deploy a layered, or multitiered, defense in evolutionary fashion from the terminal to the mid-course and eventually to the boost phase. Several principles would be important in designing such a strategic defense and in establishing its relationship with other parts of defense policy:

- There must remain a synergism of offensive and defensive forces based upon a concept of deterrence, and ensured survival if deterrence fails.

- The optimal offense-defense force mix will change as the strategic defense improves. The strategic defense will improve as the ratio between offense-defense cost effectiveness is altered to favor the strategic defense. In other words, we will evolve from a greater to a lesser dependence on ballistic missiles as the basis for deterrence. Under such circumstances, the incentive to both sides to negotiate arms control agreements sharply restricting offensive systems will

increase—the reverse of what happened in the SALT decade. In a strategy of assured survival, it is possible that doctrine would shape technological choices, which in turn would influence arms control policy. Arms control policy would lead to agreements that, as is customary with arms control agreements, codify specific sets of military relationships in a formal treaty—in this case, low levels of strategic forces, based upon the disinclination to build additional offensive forces that could be more easily countered by building a greater strategic defense.

- The greater the effectiveness of a strategic defense system against ballistic missiles, the greater will be the need to address eventually the problems associated with defense against aircraft and cruise missiles. The greater the inherent survivability of such systems, the greater their contribution to strategic stability.

In addressing the question of strategic defense and crisis stability, it is essential, once again, to ask what type of strategic defense is envisaged. A totally leak-proof strategic defense, which is probably not possible, would have the logical effect of raising dramatically the conventional threshold. A limited strategic defense that dramatically reduces the incentive to use nuclear weapons, but does not eliminate them altogether, limits but does not remove escalatory options available in the management of crises. Crisis instability would be heightened by a condition in which the survivability of the nuclear forces of one side or the other, or both sides, has been diminished. If crisis stability and force survivability are closely related, it follows that strategic defense holds the potential to play an important role in crisis management, including the deterrence of escalation and the limitation of escalation. In international crises that escalate to the nuclear level, strategic defense could serve to limit the damage of a limited use of nuclear weapons. If strategic defense can deny the Soviet Union a necessary level of confidence in Moscow's ability to destroy needed target categories to win a war, deterrence of conflict at or even below that level is likely to be reinforced.

The management of relations with allies must be seen as an important transitional problem with respect to strategic defense. Although the implications of strategic defense for allies represents a topic deserving full treatment for its own sake, the following brief observations are in order:

- The enhanced survivability of the U.S. strategic force and its various components is essential to the preservation of an extended nuclear security guarantee. In this respect, the contribution of strategic defense to such force survivability enhances extended deterrence.

- Recognizing the differences between target sets and other factors, such as warning time, between NATO Europe and the continental United States, we must decide in our R&D program the extent to which we will seek the parallel development of technologies to enhance the survivability of vital assets on the territory of allies, especially in Western Europe.
- The leakage factor in an evolutionary strategic defense concept and deployment by the United States and the Soviet Union would affect allies, and especially NATO Europe, in at least the following two ways:
  (1) The penetrability of the national nuclear forces of Britain and France. Since such forces are not presently counterforce,[1] some deterrent value would probably remain if strategic defense did not rapidly evolve to encompass area defense.
  (2) The conventional threshold would rise as strategic defense evolved to greater maturity and effectiveness.

In most, if not all, security environments which contain strategic defense, offensive forces will continue to play some role. The more defense dominant the environment, necessarily the lesser the role for strategic offensive forces.

The most fundamental changes in doctrine are encompassed in the idea of deterrence by means of assured survival, rather than a hostage relationship of mutual annihilation. However, in the absence of a fully leakproof strategic defense, nuclear offensive forces will play at least a residual role in a deterrent relationship.

Strategic defense would contribute to crisis stability by enhancing force survivability and by increasing our capacity to deter escalation and to limit escalation if deterrence fails. However, the deployment by the Soviet Union, but not by the United States, of strategic defense would have important implications for crisis instability. The longer the period between the Soviet deployment and an American strategic defense response, the greater the potential for the destabilization of the superpower relationship.

Politically and militarily, a shift in doctrine and force structure to strategic defense could have a favorable impact upon arms control accords to limit offensive strategic systems. Nevertheless, if armaments

[1]Counterforce is a strategic concept which calls for the destruction of the military capabilities of an enemy force. British and French national nuclear forces have neither the accuracy nor the yield necessary to destroy hardened nuclear targets in the USSR, thus, they are not viewed as counterforce forces.

are a manifestation of deeply rooted political differences, the reduction in specific categories of weapons—nuclear or conventional—will not remove the causes of East-West conflict. The Soviet Union will continue to pursue its strategic objectives by other means. In sum, we will continue to live in a politically and technologically dynamic environment. I will conclude my remarks at this point.

Mr. Weinrod: Our final speaker is Dr. Thomas Blau.

Dr. Blau: Public doctrine on how we think about and explain strategic defense is perhaps the key in "getting from here to there." There are good reasons for this: first, this is a democratic country where the leadership needs to explain these ideas to the electorate; second, the character of peacekeeping in the nuclear age is essentially a communicative and political process; third, public doctrine is a powerful influence on program planning. Coherent doctrine means better, cheaper programs. And diplomatically, our side and especially our allies need to understand what we are doing, why we are doing it, and how we understand the world around us; and so does the other side.

Therefore, the nature of the public debate on strategic defense is extremely important to its evolution. In this regard, a little less unanimity among those supporting defense may be desirable. We have had only disappointing give-and-take among people who disagree on strategic defense. But in the end, if these issues are to develop positively, they will have to be made clearer for the mass of people who do not necessarily feel instantly comfortable with strategic planning, even if it aims at reducing their original anxieties.

We also need generalized arguments to deal with certain elite audiences such as the press. The press has a lot of problems understanding these issues. The people are intelligent enough, but apparently there is an educational process that is not going on.

There is also a special problem in communicating with the allies on strategic defense, which can only be touched upon here. However, we can suspect that, at least in the short term, wherever the U.S. goes in this area will be criticized by some Europeans. Therefore, the United States needs to focus on the long-term explanations that can eventually make sense to its allies. This requires explanations that are basically sound. This is harder than it seems.

Strategic and theater doctrines currently in place are not very promising grounds on which to plant strategic defense, except for the fact that their very deficiencies continue to re-inspire efforts toward strategic defense. As the current unhappiness of most sides of the defense debate (except for the bureaucracy) suggests, these doctrines may be ripe for

elucidation of their contradictions, and for change. This exposure is probably essential if strategic defense is going to be discussed coherently and be developed in the national interest. The alternative may be more bootless polemics between those who would face the continuing Soviet threat with big buildups of our own, and those who would face it with passivity.

So far, we should not be surprised that the arguments we are hearing on Strategic Defense are essentially the same ones we have heard for over 15 years. The contradictions, however, are still there. We are, for example, still trying to preserve peace by threatening to ensure holocaust. We should not be surprised that it is not easy to find a place for strategic defense in this context.

What *has* developed over the years has been a reificiation of deterrence. In the 1950s, deterrence was a means of achieving the goals of peace and stability. In the 1960s, deterrence started to become a goal in and of itself, to the extent that today many wonder whether its single-minded pursuit makes peace and stability *less* likely. This is the kind of contradiction which leads most people, sensibly enough, not to want to be held hostage by nuclear weapons, even when protected by brilliant theories. The point is, some of the key ideas of current doctrine could only be believed by someone with an advanced degree. Since such people are not yet a majority, it is not surprising that current doctrines such as Mutual Assured Destruction are causing electoral problems.

For example, take the currently discussed notion of Launch on Warning as a "solution" to U.S. vulnerability. Launch on Warning seems little changed over some 15 years. The idea is that, even if our land-based missiles are threatened totally, we are going to let the Soviets know that as soon as we see the "blips on the radar," we would not wait even for confirmation before "retaliation." We would simply launch. Now, this is a profoundly reckless idea, and yet it is proposed by the people who are intellectually leading the anti-nuclear movement and who helped kill strategic defense over a dozen years ago. It seems to me that Launch on Warning has not received the devastating critique that it deserves, not since Paul Wolfowitz's Senate testimony a dozen years ago.

Another flawed idea is currently crippling debate over strategic defense. This is that strategic defense means or requires a perfect defense. It is suggested by both supporters and opponents of strategic defense. This notion is assumed and then exploited by critics, with a certain amount of success before the rational layman. Obviously, few things in life work perfectly, especially large and complicated man-machine systems like Three Mile Island or the space shuttle. Why strategic defense will work

perfectly is a good question if you believe that perfection is necessary to a strategic defense that is useful. Yet there is little certainty about whether the Administration is planning something that is supposed to work perfectly. This week Secretary of Defense Weinberger has given a speech which has been perhaps the first public indication that they do not think that, but one speech does not make it a spring.

The very early, very public search for a total solution, in other words a perfect, leakproof, heavy population defense, may be technically as well as strategically premature. It also may be logically questionable; the baby must crawl before it walks. And it may be politically dangerous. It may be asking for the political demise of the program by setting too high a goal as it neglects achievable intermediate steps.

It may make more sense, and be more straightforward, to explain that the search for strategic defense is compelled by the need to preserve stable deterrence. Deterrence and stability are under severe pressure from the current Soviet buildups. The question is how to respond. One alternative to strategic defense, which its detractors have hardly addressed, is to respond to Soviet large-scale offensive buildups by matching those of the Soviets. Some of them might rethink strategic defense if that is the alternative.

In other words, what the United States perhaps should be emphasizing today is terminal defense. Strategic terminal defense may be the best way to preserve the deterrent value of current U.S. strategic forces under Soviet pressure. The first U.S. requirement is to blunt the edge of any possible Soviet first strike which is even considered by the Politburo, thereby preserving stability and peace.

This may require not a certainty of preserving all the Minuteman under a Soviet strike, but of preserving some—a number to be worked out. Such a requirement should be technically and budgetarily modest compared either to building a leakproof total defense or to building our own SS-18 fleet. However, its payoff in terms of deterrence and in terms of its acceptability in public discourse would be far higher, because it is easier, cheaper, and more believable. If the United States can do this with routinized programs of implementation, it may pave the way to a mutually acceptable heavy defense regime on both sides in the long-term.

Meanwhile, the role of offensive forces in the short-term would seem to be unchanged. The arguments for the B-1, the D-5, and Midgetman would seem to continue undisturbed by the prospects for strategic defense; indeed, as essentially second-strike systems, they are mutually enhancing. The MX is a separate problem, but the forces opposing MX do not emanate from strategic defense.

It is possible that if both superpowers are focused on defense at the strategic intercontinental level of potential conflict, and such conflict is thereby made less likely, then lower-level conflict could become more likely. This would certainly further complicate the lives of policymakers trying to avoid all conflicts, but that is what they are paid for.

From the standpoint of the world and the nation, even if lower level tensions worsen, this is not the worst of all possible outcomes. Little wars are not as bad as big wars. In addition, it may not be totally naive to hope that if mutual superpower annihilation or even large-scale lower level conflict is less likely, then certain benefits may accrue to the diplomatic atmosphere. Reduced tensions about the most disastrous of conflicts might further reduce tensions, leading to a reduction in all conflicts over time. In the short- to medium-term, however, crisis stability is enhanced if the more peaceful party of the two superpowers improves its deterrence. In principle, defense can be a way to do so which responds to the anxieties of all sides of the American strategic debate.

"Third country benefits" from U.S. strategic defense also deserve attention in the medium-term. Nuclear weapons proliferation is a problem, and threats by smaller countries against this superpower, at least, are not out of the question by the year 2000. If we can preclude that, we've made major gains for stability.

In sum, it appears that the state of U.S. strategic and theater doctrine is both an obstacle to, and the opportunity for development of strategic defense. Failure to address the doctrinal issue will leave us with the unsuccessful alternatives of the past in meeting the threat, either of building a counterthreat or of diplomatic passivity. To these, defense can be an alternative.

Mr. Weinrod: Thank you very much, Tom. If any of the panelists have any brief comments on what has been said thus far, this would be the appropriate time.

Dr. Gray: Some thoughts coming out of Tom Blau's presentation—I believe there is a fair amount of evidence by way of the letter flow that came into the White House after the speech on March 23 that there is a vast constituency in the country, not just pseudo-sophisticated intellectuals, for the defense of the country. The level of fairly elementary presentation, the idea of a defensive transition, is an inherent winner and I do not think you'd have much difficulty attracting favorable attention from the voters for the idea of defending Americans as opposed to threatening to kill the Russians. But I believe in terms of basic attitudes that the public is ahead of Congress and certainly is ahead of the media on this subject.

On similar lines, I think what the President did last year was to provide the first step for a degree of political legitimacy to the idea of strategic defense that has been lacking for a generation since the air defense programs of the mid- to late-1950s. I think it is reasonable that folks out there might look at the continuation of the nuclear arms competition and say "My God, even though we need to be prepared, where is it all going to end?" I think there is a genuine problem of legitimacy about our continuing modernization of forces and our sustenance of nuclear defenses. And I think it is a moral and political imperative that the White House have the story, and preferably one they would genuinely believe in and one that has very substantive merit. And I think the SDI in a defensive transition does that. The folks out there say, "I do not see where East-West political relations are going to end in terms of a resolution of differences. Where is the nuclear arms competition going to end, even though I certainly do not want us to fall behind." There is a story here. There is a story for the substantial disarmament of offensive forces. This may occur through formal negotiations. The collection of moral and political arguments that should surround the defensive transition does, I think, and certainly should, go a long way to provide the kind of answers that an administration needs to provide to a worried populous that isn't necessarily running behind the "Pied Pipers of Freezing Now." But it is posing the question "What is the government doing about it? Where is it all going to end?" I think it is a very reasonable man-in-the-street question to ask.

Also I would like to agree with Tom Blau's point that I do not think there are any plausible alternatives to our exploring where an SDI may take us. In other words, if you do not like the SDI or you do not like the promise of a strategic defensive transition, what kind of a future do you see? The alternative is not arms control and/or disarmament or an SDI or somehow a political peace; and the political peace issue is substantially apart from SDI and defensive transition issues. The alternative to our proceeding with whatever an SDI may become is unallayed competition in strategic offensive forces, maybe with the help of marginal tinkering around the edges with START agreements, maybe not—though by and large as long as political relations remain bad, there will not be agreement. I think there is a political legitimacy need for Western governments to have an SDI story and I do not think there is any alternative.

Dr. Pfaltzgraff: Just one or two very brief comments. The first is that I am in full agreement with the idea that we need to present in the U.S. public debate a far more cogent case for strategic defense. I understand that the Administration, perhaps for its own good reasons, is seeking to

defer much of that discussion until after November of 1984. Perhaps that is the correct decision to make in light of the many issues that we already have on the agenda. However, I would want to reiterate the point that there is a strong case to be made for strategic defense, both in a national security context and in a moral context. In fact, the American people, if one looks at American attitudes toward defense policy over the years, want to maintain a strong military capability, which they thought they were not getting by the end of the 1970s. But at the same time, they want, in keeping with the idealism of Americans as a society, to hold out some hope for an alternative to piling armaments upon armaments.

The nuclear freeze campaign and its variants have sought to capitalize, with varying degrees of effectiveness, on this latter principle. Suffice it to say that from the standpoint of building consensus for defense policy, it seems to me that a plausible alternative to the nuclear freeze, and to those who argue the need for arms control *per se* in the United States, is to provide for transition to a capability which ensures deterrence by survival rather than by mutual annihilation. I want to reinforce the notion that this is an area that needs a great deal more discussion here and in Western Europe. It is all well and good, as I tried to do in my remarks, to say something about the alliance problems. But I would argue that the alliance problems are not going to be solved if we cannot develop and sustain the consensus that we need to at home.

One final observation which brings me back to the various comments that I made and that others have made about the technical issues. It seems to me that inherent in the American approach to technology is the idea that there is somehow a weapons system which has elements of perfectability within it. We long ago abandoned ongoing arms programs and weapons systems because we found certain technical deficiencies in them. They were 60 percent effective or 80 percent effective and not 100 percent effective. I believe that this is a totally different approach to weaponry to that which is found in the Soviet Union. The Soviet Union does not make this clear distinction. Weapons that are far less likely to succeed than we would like—80, 90, 100 percent—are nevertheless likely to be adopted in the Soviet Union. Therefore, if we seek in this country a strategic defense capability which is flawless, I believe that we will misjudge what the Soviets will do for their part. They will deploy a system which is far less leakproof and they will not argue about the leakproof issue. They will seek weapons systems in this regard, as they have in other areas in which the probability of certainty of operation may be far lower than optimally we would need in the United States, given our penchant for seeking technical solutions to problems with the very best technol-

ogies. So I would enter that cautionary element into our discussion, and I would reiterate the point that we must not allow the best to be the enemy of the good.

Guy Barrasch, Office of the Secretary of Defense: A dominant question about the transition in my mind is, if you put this to the American public and said "We're going to make a transition to the defense thing," they would said "What transition? Aren't we already defended?" Any comments about the role of convincing the American public that although they may think of themselves as being defended, there are no defenses in place? Could there be a groundswell that would help the transition process at least?

Dr. Blau: I think all that one can say is there has not been a great deal of presidential elucidation or edification in this area or in the whole area of deterrence. The fact that the American public is still confused on the subject of overkill, although not as confused as the media, shows that there really has been an inadequate use of the bully pulpit by those who have it.

Dr. Gray: I am told that briefing officers at Cheyenne Mountain regularly surprise groups of visitors by advising them that the massive amounts of American rocketry which they have heard about in the media essentially contribute nothing or next to nothing to the direct defense of the country.

Mr. Weinrod: Let me ask a question to Colin Gray. In our first panel discussion, a colleague of yours, Rebecca Strode, raised a point, if I am stating it correctly, that if both the Soviet Union and the United States were to deploy systems that had relatively low leakage, there really would be some advantage to the Soviet Union in that they care less about destruction in the first place. They are willing to tolerate more than we are. Then, in a certain kind of situation, it might work to their advantage. Could any of you comment on that?

Dr. Gray: I think I agree with my colleague that you can make an argument that in such a world of dominant defense, the Soviets can more easily tolerate leakage than can we. When one considers target sets and their respective values, the Soviets are more able to cope with the effects of a limited damage situation. The Soviets consider the value of their command and control structure to be of paramount importance, whereas human life is of much more concern to the U.S. Thus, the loss of a city would not be as severe a consequence to the Soviets as to the Americans. Similarly you can go even further than Rebecca did and say in a world of genuinely "Astrodome" defenses and genuinely sanctuary superpowers, given where their country is and given where our country is, we have a

very serious national security problem with regard to defending the periphery of Eurasia.

People like me, who think the SDI is an essential program of possibilities for us to explore, acknowledge that there are serious problems, but I'd rather view them as challenges. I would love to cope with the policy challenge of a world where we really cannot do very much damage at home. And I will accept that there are some assymetries between our political system and the Soviet system which give them some real advantages. There are some assymetries in geographical location that give them some real advantages. That is a challenge which we have 10, 20, or 30 years to try to solve. And with the combination of defense mobilization, conventional defense, residual fears of leakage (because who knows how it will really work) and other things that one might think of, I will take that as a challenge and I will take the risk that it will work to our disadvantage. But she is right, basically, in structure.

Dr. Pfaltzgraff: Just very briefly: the question of what the Soviet Union can tolerate with respect to leakage is also a question of what it takes to deter. We have talked for two generations about what is the force structure needed for deterrence and the various calculations from the McNamara period and on about those requirements. We would have to do a good deal more to think about this in the context of what the Soviet Union could afford to absorb with respect to leakage and how that would break down in a deterrence relationship. I do not regard this as any more insurmountable a problem than it has been to examine the requirements for deterrence in an offense dominant strategic environment.

My final point is that the Soviet Union, if I understand its concept of strategic defense and air defense, which are central elements of its military posture, seeks to minimize the leakage rate on the Soviet side. It follows that in a deterrence relationship in which one side has minimized that leakage rate, and the other side has done nothing, the side which has minimized is likely to prevail in a political crisis against the side which has done nothing. The problem with the United States today among other things, and this is not understood by a large number of the American people, is that we are not defended in any sense against an air threat. We have not been for the last 15 years, since the 1960s, when for all practical purposes we abandoned air defense. NORAD became simply an organization, as I would describe it, which could only say, "They came from that direction and they're going that way. Now you do what you can about it," which is very little.

Doug Graham, Senate Armed Services Committee: Again, last week there was another panelist's statement made that I would like the panel's

comments on. I hope I am not misrepresenting Mrs. Strode's point of view, but she said that it did not make sense for us to deploy strategic defenses against ballistic missiles without also deploying defenses against bombers and cruise missiles. I believe she made that comment. I didn't agree with it. I did not take it up at the time but I would be interested in your comments.

Dr. Gray: Yes, I agree with her. I have said this on numerous occasions and I will repeat it here. I think it makes no sense to proceed with BMD in the absence of air defense. When you look at what our intelligence community is projecting for the Soviet air breathing threats for the early to mid-1990s, in general terms, we are looking at a very much larger threat, of more sophisticated character, than we face currently. In the same way you can argue that the SALT framework of the 1970s encouraged, if the Soviets needed encouragement, the Soviets to deploy longer-range theater systems like the SS-20. There is no doubt that if the Soviets are convinced that our SDI has considerable technical promise, whatever incentive they need would thereby be provided to encourage them to do what they are doing anyway, which is to move quickly on long-range cruise missiles and a new generation of aircraft.

I think if we talk about an SDI and a defensive transition solely in the context of ballistic missiles, it is like putting up a tent with great flaps open at both ends. It is absurd. Similarly, it makes very little sense to talk about an SDI and a concept of assured survival unless you are willing to bite the bullet on civil defense. The trouble with making a strong pitch with civil defense is that a skeptical audience is likely to say, "Hey, you're pitching so hard for civil defense, does that mean you do not believe that your BMD technology is going to work? If you're promising very, very high attrition of many tiers with an active defense, why do I need extensive civil defense preparation?" Obviously the payoff from even modest civil defense is multiplied manyfold if one has the kind of comprehensive air and missile defense I think we should be developing. I agree with her. I think BMD without air defense is absurd.

Dr. Pfaltzgraff: First of all I agree with what Colin has said, but I want to add one or two additional points. The first is that one of the reasons that I have long favored the cruise missile is that it would force the Soviet Union to spend a great deal more to counter the cruise missile. We hoped that it would divert resources from what the Soviet Union could put into offensive capabilities. To be sure, with or without an American cruise missile program, in my view the Soviet Union would have continued its own cruise missile program.

The second point is that it is essential that we pursue R&D against the

emerging threat from cruise missiles. But the greater problem that we need to address now is against ballistic missiles. This was the point that I tried to make in my remarks, because I take as my point of departure, in my analysis of strategic defense, the notion of survivability. I would argue that cruise missiles can be deployed in sufficient numbers to satisfy that survivability. Instability does not arise from the cruise missile. It arises from the threat to survivability of strategic forces. And in that sense the cruise missile is a contribution to stability, not a detriment.

Dr. Gray: There is, of course, a Soviet point of view on that, and we may be approaching the Soviet point of view in the years to come, and that is, of course, that a long-range cruise missile does not have the kind of launch signature that you get in a massive plume from an ICBM or even an IRBM. While the standard American stability argument is that the slow-to-arrive long-range cruise missile inherently is not a first strike weapon, the Soviets have argued, and I can see us arguing in the years to come, that long-range cruise missiles, with virtually their whole flight regime at a very low altitude and without the kind of launch signatures that are easily detected from space, could well be a very effective first strike weapon.

Dr. Blau: But none of this speculation is a reason for shooting down the strategic defense initiative.

Guy Barrasch: It strikes me that people have been talking about assymetries that exist that would tend to favor the Soviet Union in an exchange in which defenses were not very capable, or even fairly capable. There is another assymetry that needs to be taken into account that tends to disfavor the Soviet Union, and that is the idea that they are the ones that have to make the decision to go first. They are the ones that have to sit there and do their calculations and say "Today's the day." That is a tough decision to make, particularly when you're facing powerful defense. And it may tend to override some of those disadvantages.

Dr. Gray: Guy, that is a hell of an assumption. If you believe General Rogers and others, the balance of forces on the ground today, and respectively ten years from now in Europe, is such that the side that is going to be facing that burden of decision for the first long-range nuclear use should logically be us. It may in practice be the Soviets if they observe the signals of our release procedures and open "three no trumps" or whatever very rapidly. But nonetheless, the logical result of our vulnerability on the ground is such that I think it is the reverse to what you just said.

Mr. Weinrod: I think that will about wrap it up. I want to thank our panelists very much and thank you for coming.

Panel 5

Strategic Defense: Implications for the Pacific Basin

Panelists:
Kevin Lewis, RAND Corporation
John Copper, Southwestern University
Gordon McCormick, *Orbis*
Leon Sloss, Leon Sloss Associates

May 11, 1984
The Louis Lehrman Auditorium
The Heritage Foundation

Manfred Hamm: My name is Manfred Hamm, Senior Policy Analyst at The Heritage Foundation. I will be moderating today's first session, on Strategic Defense and the Pacific Basin. This session will be followed by a second session on the impact of strategic defense on Western Europe.

Very little commentary has been given on the interrelationship of strategic defense, President Reagan's Strategic Defense Initiative (SDI) and our national security interests and commitments in the Pacific region. I am confident that our panelists today will break new ground in discussing, from various vantage points, the impact that different types of systems which are usually referred to as a "strategic defense package" will have for the Pacific Basin.

With us today are Dr. Kevin Lewis, Dr. John Copper, Mr. Gordon McCormick, and Ambassador Leon Sloss, all of whom are distinguished experts in their respective fields. May I ask Dr. Lewis to begin today's discussion, followed by Dr. Copper, Mr. Sloss and Mr. McCormick.

Dr. Lewis: Thank you, Manfred.

From a technological point of view, let me note at the outset that it is good to keep in mind the fact that the space-based concepts—known generically as Defense Against Ballistic Missiles (DABM)—are all basically blind to geography. Except for polar coverage and special features, space-based constellations will cover the Pacific just as they would cover Europe.

Let me go on to my main points. We can look at the strategic defense initiative from three angles, operationally speaking. First, we can remove the nuclear threat *per se*. That is the President's objective as laid out in his March 23, 1983 speech. In theory, then, SDI perhaps can do what arms control could not alone: nuclear weapons would no longer be players in any kind of major conflict. Second, we could use defense as an adjunct to offense—that is, maintain the status quo, but install a defensive overlay which would enhance the ability of our offensive forces to perform their traditional missions. For instance, we could use SDI to mop up Soviet retaliatory attacks after a U.S.-first counterforce strike. Or we could use SDI to buy valuable time for National Command Authority (NCA) evacuation or to assure the survival of forces that normally take off on tactical warning.

The third way to look at the operational implications of SDI is from the limited nuclear war perspective. I think this is the most important strategic point raised by SDI. Mutual SDI deployment might put us out of the limited nuclear-option business altogether. It could also put smaller nuclear powers out of the limited option business, either by increasing the

uncertainties involved in minimum deterrent-type planning drills or, depending on the nature of the system employed, by imposing unacceptably high costs of gaining access to a small power seeking to penetrate a superpower SDI network.

Now let me just briefly touch on each of these three issues that I have mentioned. The core of the first, removing the Soviet nuclear threat totally, is much discussed and I will not bore you with its details here. Let me just note in the context of this forum that there is the question of removing the nuclear threat posed to the U.S. by some third (i.e., non-Soviet) nuclear power in the Pacific region. For this application, in my view, one does not need anything like the kinds of advanced SDI concepts that have been discussed so far. The requirement to deal with third powers, as I believe the SAFEGUARD[1] debate showed us, is not a very compelling rationale for buying expensive advanced systems. Moreover, the Soviet nuclear threat, both in and from the Pacific theater, is now being tended to, I think, by existing programs, mainly anti-submarine warfare (ASW) activities. In that regard we must keep in mind that by "strategic defense," we are talking about a very broad range of things: not just defense against ballistic missiles, but also the detection and destruction of enemy submarines and aircraft.

Let me remind you that looking at this question from the Soviet point of view, we have recently compounded their SDI problem greatly by virtue of our Trident submarine deployments in the Pacific. We now can pose a very sophisticated threat to the Soviet Union from a 360 degree azimuth. For instance, when Trident II comes on line in 1989, the Soviets will have to worry about a ballistic counterforce threat emerging from directions that they have not had to deal with so far.

The second operational issue concerns SDI as an adjunct to our existing offensively-oriented posture. In my view, there is not much to say about this as far as the Pacific Basin is explicitly concerned. The U.S. is now making a very great effort to remove sources of vulnerability that result from the geographic locations of our force deployments. And I doubt that B-1s will ever be deployed in California or at Andersen Air Force Base on Guam. We are moving them back and basing them as far inland as we possibly can. The whole problem here, of course, is that enemy naval forces can sneak up on these bases, reducing tactical warning and time of flight of their attack on these important targets; that is an unacceptable risk. Thus, SDI as an adjunct to offensive central strategic operations oriented

[1]The SAFEGUARD was a limited area defense anti-ballistic missile system whose mission in 1969-1970 was to defend U.S. military assets.

to the Pacific area is, apparently, mainly a passive defense[2] problem. A minor exception, of course, is the use of SDI to enhance the ability of offensive forces to recover and regroup.

Finally, SDI is a most important issue in the limited nuclear war context. And here we have the old good news-bad news tradeoff. The bad news, I think, tends to be military, especially should any successful space-based DABM be involved. If DABM works as promised, it tends to drive one's offensive posture toward an inventory of shorter-range systems;[3] by virtue of flight time and lower trajectories, such weapons are less vulnerable to SDI. When it comes to the shorter-range offense-target domain in the Pacific, there just isn't the same rich target set or areas for missile bases that we find, for instance, in Europe. By contrast, the longer-range attack option is very important in the Pacific as compared with Europe, of course.

Second, the Pacific is, to overgeneralize, "a Navy theater." I am sure Gordon McCormick will go into more detail on this, but remember that surface navies and nuclear weapons do not mix too well. We have got to determine whether the probability of some kinds of theater nuclear warfare go up—and jeopardize certain naval forces—as the probability of some kinds of central war go down, as a result of DABM shutting naval forces down. We need to ask what is thereby implied for our maritime posture for the 21st century?

The good news, and again I will defer to the other panelists on this, is that I think the pertinent political situation is much more congenial in the Pacific than in Europe. By deploying SDI, we would not be jeopardizing or neutralizing any friendly arsenal. There is also less general anxiety, I think, with regard to nuclear weapons in Asia, although anxiety certainly has the potential to develop as any major debate gets going. I do not know for sure, but strategic defense may in fact be an attractive proposition from a Japanese point of view. You cannot defend yourself without defending others, especially when you are talking about defeating the Soviet threat. This might lead to some very attractive coalitional defense efforts. And finally, there is just much less of an extended deterrent[4] need in the Pacific.

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[2]Passive defenses counter enemy weaponry without taking any direct action against the weapon. Technologies such as early warning radars, chaff and decoy launchers, and electronic countermeasures provide the main passive defense measures against a cruise missile threat.

[3]Short range systems are usually defined as 800 km or less.

[4]Extended deterrence is the extension of U.S. nuclear power to guarantee the security of other than U.S. territory.

So I would say in summary that from a military and an operational point of view, the issues raised by SDI are much less pressing and may almost be trivial compared to those that we may face in Europe.

Mr. Hamm: Thank you very much, Kevin. Dr. Copper will now address us.

Dr. Copper: Thank you, Manfred. I want to speak about the strategic defense issue in relation to Asia, in general. What I want to do is to put it into context. If you read the arguments concerning strategic defense, you notice soon there is very little said about Asia. This is primarily because people with an interest in strategic studies have come from that field or have had an interest in Europe. Asian scholars simply have not focused on strategic defense very much. This is not to say, however, that the issue doesn't relate to Asia; it certainly does. It is not to say that Asian countries are not concerned about strategic defense; they are, and I will get to that in a moment. And it is not to say that the United States should not or does not have an interest in Asia relating to strategic defense, because it does.

First let me say something about the importance of Asia. It needs to be mentioned because of U.S. interests in the area, which are naturally relevant to the strategic defense issue. The world's first, second, third, fifth, sixth and seventh most populated nations are in Asia. Our Asian population in the United States has increased 250 percent in the last ten years. Since 1977, more of our trade has gone in the direction of the Pacific than across the Atlantic. The 1982 figures indicate that $110 billion crossed the Atlantic Ocean while $125 billion crossed the Pacific, and the gap is growing. You find in Asia the second largest economic power, Japan. The four most successful Asian countries in terms of economic growth are South Korea, Taiwan, Hong Kong, Singapore. In addition, businessmen say Southeast Asia is the most promising underdeveloped area in the world.

Regarding the strategic questions, let me say first that in my lifetime the United States has fought two wars. Both of those wars have been in Asia. We have not fought what I would define as a war anywhere else. And I think if we were to fight a future war, it might well be in Asia. This is not at all, I think, an unreasonable prediction.

The Soviet military buildup in Asia is alarming. Since the mid-1960s, Soviet ground forces have increased by threefold or more, from approximately 15 land divisions to over 50. Their air and naval strength has increased even faster than that. The Soviet Pacific fleet is larger than any of its other fleets. It has 85 major large ships in Asia, including an aircraft carrier, 235 smaller ships, and 125 submarines. Half of the Soviet Union's nuclear naval power is in Asia.

Looking at the Soviet air force, we find 800 fighters, 250 bombers and

150-plus SS-20 missiles in Asia that we think are targeted at the People's Republic of China, although we are not certain. They can be re-targeted quickly in any case. Another point of importance is that, in the context of strategic missile defense, the Soviets have had missile defense capabilities in Asia for a number of years in the form of the SA-5 surface-to-air missile. Also, it may be of interest (this is just rumor but it is of interest anyway, I think) that when the Soviet Union shot down the Korean Airlines 007, the timing and location suggest that the Soviet Union did not want to use their sophisticated radars in that area; if they had, we would have picked this up by satellite and would have known immediately that this was in violation of the ABM treaty. In any case, it is very clear that the Soviet Union is serious about strategic missile defense in Asia.

Now let me look for just a moment at the actors in Asia and what they're thinking in regard to strategic defense. You may have heard that Deng Xiaoping has engineered a plan called The Four Modernizations to make China a modern country and that the military is the fourth of those four. Nonetheless, strategic military operations are of the first priority in China now. No one's talking about People's War anymore. Just in the last few years the PRC has built an ICBM and a submarine-launched ballistic missile. Also, they are very active in space research, spy satellites and so forth. We have an intelligence base in the PRC, where we are sharing intelligence with them and they are trying to build a deterrent against the Soviet Union.

When President Reagan made his so-called "Star Wars" speech in March, the Chinese reacted in a rather neutral way. Later they criticized the United States and the Soviet Union for engaging in an arms race in space. But the Chinese have never said, to my knowledge at least, that this concept will not work. It seems apparent that they feel that the plan for strategic defense will work.

If Japan, a country that is militarily weak yet has the seventh largest defense budget in the world, would raise its spending on defense from one percent of its GNP to one and a half percent, it would still be spending only one quarter of what we do as a percentage of GNP. The Japanese would immediately jump to number four in the world in terms of military spending. This could happen in about five years. Also, it is worth noting that the Japanese have taken a very different attitude about strategic issues recently. In 1978 they started discussing with us strategic plans. In 1980 they engaged in naval exercises with the United States, Australia and New Zealand. In 1983, in their annual defense report, they identified the Soviet Union as an enemy country and clarified their strategic doctrine.

Regarding strategic defense and the "Star Wars" speech, the Japanese

reacted similarly to the PRC. The liberal press in Japan criticized it, but no one said that it would not work. The Japanese believe that it will work. They also are spending a lot of money on space research. They have put up 26 satellites as of November of last year. Six of these were geostationery satellites. The Japanese will be spending much more in the future on space research.

A couple of other nations in the military equation in Asia will relate to a final point that I would like to make. One is Vietnam. It has over 1 million men in arms, most on the border with China, but also over 150,000 in Kampuchea, all supported by considerable Soviet military aid. India has also benefitted from its ties with the Soviet Union. The problem, as I see it, is that the Soviet Union has built up its forces in Asia in a momentous way. Yet in Northeast Asia, the Soviet Union is still very much disadvantaged by geography. The straits surrounding their major bases are very close to the People's Republic of China. If the United States follows a policy of what is called "horizontal escalation" and reacts to what the Soviets do somewhere else by closing the straits in Northeast Asia, Moscow will be in a predicament in which it does not want to find itself. The Soviets have reacted by talking about using nuclear weapons against Japan and the PRC. They have also sought to link up their military, especially the air force and the navy, most particularly the navy, in Northeast Asia with forces in Southeast Asia. The United States can counter this, particularly the intimidation tactics against Japan, by building strategic defense. We can do so in cooperation with Japan; there is talk about doing it in cooperation with the People's Republic of China. I think the former presents no problems; Japan is clearly an ally of the United States. Ambassador Mansfield has spoken of Japan as being the most important country to the United States of any country in the world. The problem in terms of helping or cooperating with the People's Republic of China is quite different. China is a temporary ally at most.

Mr. Hamm: Thank you very much, John, for your detailed overview of the strategic context in which to look at the strategic defense initiative that the President proposed in March of last year.

May I now call upon Ambassador Sloss for his commentary.

Ambassador Sloss: I want to talk primarily about how SDI might apply to Japan and Korea, but just a few words of introduction. The area that I am going to discuss, as have the two previous speakers, is really the Western Pacific and the land areas bordering that ocean. But we should bear in mind that as seen from the perspective of the American commander in the Pacific stationed at Pearl Harbor, that is only part of his do-

main, which stretches all the way to the East coast of Africa and the Persian Gulf. And viewed in terms of U.S. military assets, that whole area has to be looked on as an entity. I think any of you who have looked at that picture recently know that U.S. military assets are stretched very thin across this immense and very diverse area. That is one way in which it differs markedly from Europe. The commander of U.S. forces in the Pacific has to be prepared to operate anywhere in that area on very short notice. And that is particularly true of naval forces, which do so regularly.

Let me say a word about trying to structure how we think about the type of defenses to be considered. I find it useful to think about the short-run, the medium-term and the long-term. In the short-run, by which I mean the balance of this decade, there really are not going to be any ballistic missile defense (BMD) deployments; certainly not under current BMD plans. It is not going to be available to be deployed because what we are engaged in is a long-term research program, with no immediate plans for deploying capabilities. That is not so much true of the Soviets, as has been pointed out. They could have a deployed capability. They do have some now and could have a good deal more by the end of this decade. There are some air defenses for the fleet, and in Japan and Korea. But we should think about the period of the 1980s as a period in which we will continue to rely substantially on offensive forces for strategic deterrence globally and in the Pacific arena.

In the mid-term, which I call the 1990s, there could be some ballistic missile defense deployed. This could include tactical ballistic missile defenses, employing some of the advanced technology that has been talked about a great deal in the last year. Such a defense might have important applications in the Pacific area which I will discuss further in a minute. But here I may have some difference with Mr. Lewis, because I think there may be some very important areas, particularly in this mid-term, where defense can be seen as a supplement to offense. During the 1990 period, however, any defenses that are deployed are likely to be much more effective in defending military forces and command and control than in defending population. Such defenses would be far from perfect in this period. Still, as I shall suggest below, even modest defense could have very important strategic utility. This is a point which is now beginning to come out in the discussion. This is not to say that the kinds of defenses that the President called for last year would not also be important, but in my opinion, the defenses that you could get in the 1990s would be far less than perfect in that time period. But they could be very important and could be deployed as a complement to offensive forces.

In the long-term, after the year 2,000, far better defenses might be possible and include defense of population. But at this point it is not possible to say whether a useful defense for population would be feasible, at least in my view. And, of course, what would be useful would depend on what a defense is expected to do.

Now just a word about the possible scenarios. Again this illustrates the diversity of this vast area, and we cannot begin to talk about all of these scenarios, but just to illustrate the kinds of contingencies that we have to think about in the Pacific area and then relate defenses to that.

Possible scenarios include: a North Korean attack on South Korea; a Chinese threat to Taiwan; Soviet intimidation of or an attack on Japan; PRC-Vietnamese conflict; expanded Vietnamese aggression against its neighbors; Sino-Soviet conflict; a U.S.-Soviet war at sea; and a general war. Obviously it is hard to generalize about the role of defense when you have such a rich menu of potential contingencies, all of which, I would maintain, would have varying degrees of impact on U.S. interests.

What are the major defense problems of the U.S. in this area? Some of them have been alluded to. One is this massive Soviet buildup of military power to which Dr. Copper referred, coupled with a decline in U.S. power, certainly since the Vietnam war ended. This creates not only military problems but political problems, because that change in the military balance is keenly perceived in Asia. It is certainly talked about if you visit Japan or Taiwan. People in Asia who pay any attention to military affairs are keenly aware of this problem. So even short of there being a war, it is having a political impact. The U.S. depends upon a few relatively vulnerable bases in the area, almost all of which are on the territory of third parties. So we are dependent upon third parties for those bases. We have long lines of supply. The forces that CINCPAC deploys, as I have said, are very thinly spread over this vast area. The Soviets could operate against our fleet from bases that would be a sanctuary in many contingencies. Access to China is very difficult for us, and there is a growing Soviet missile threat, particularly pertinent to the subject of strategic defense, both in the area of tactical ballistic missiles and cruise missiles.

What are some of the possible applications of defense? In general, a ballistic missile defense or air defense, for that matter, would improve the capability of U.S. forces and bases to survive initial attacks, thereby enhancing U.S. capability to defend Japan and Korea and sea lanes vital to our power projection in the area. Among the categories that we have to consider are: base defense; fleet defense, which I think will be discussed at greater length by Mr. McCormick; and defense of Japan and Korea. This

last area is what I want to spend the few remaining minutes on.

Insofar as Japan is concerned, it seems to me that the key question, or the initial question, is: does Japan want to be defended? I believe that attitudes in Japan must change quite radically for them to accept a ballistic missile defense. But as Dr. Copper pointed out, there have been signs of change in the Japanese attitude toward defense in the last few years. I would say that they would have to change a good deal more. Nevertheless, defenses may, in the longer run, prove more acceptable to Japan than building up offensive forces. And furthermore, the high-tech opportunities that exist in BMD may be very appealing to Japanese industry.

One of the interesting aspects of ballistic missile defense is the possibility it presents for providing some assurance to Japan, in time of crisis, of reducing Soviet prospects for blackmail. It is often assumed, when we think about the prospect of conflict, that if the U.S. and the Soviets were engaged in a war in the Western Pacific, the Soviets would put intense pressure on Japan to remain neutral. The Soviet Union would pose the prospect of attacks on U.S. bases or attacks on Japan with devastating collateral effects. If those bases were defended, it just might be possible for Japan to be more resistant to such pressures.

In a broader sense, Japan today is very sensitive, as I have suggested, to the significant changes in the U.S.-Soviet military balance affecting the Asian area since 1975. One of many military developments that has aroused concern in Japan, as we all know, is the Soviet deployment of SS-20s in the Far East. This situation is exacerbated, by the way, by the prospect that we might come to a deal with the Soviets which would limit SS-20s in Europe but not in the Far East. I hope that possibility is behind us.

The introduction of an effective defense in Japan—if it could be demonstrated that such a defense would work effectively, and that is a big if—might help to offset some of these Japanese concerns. I don't want to minimize the initial obstacles that would have to be overcome, or the political obstacles, because I do not think it is in the cards in the next few years. However, neither should we assume Japanese opinion on these issues is immutable. One of the reasons for seriously exploring options for tactical ballistic missile defense that are opened by the new BMD technologies is the promise they offer for defenses in allied countries such as Japan and Korea. I have already referred to the potential interest of Japan in the industrial and technological prospects.

Just a word about Korea—the missile threat to Korea today is limited unless North Korea were to be supported by China or the Soviets. Both

the Chinese and the North Koreans have FROGs[5]—at least that's what the International Institute for Strategic Studies (IISS) military balance tells me. But the FROG is such a short-range system that a ballistic missile defense is unlikely to be effective against this type of a missile. However, the Soviet ballistic missile threat in Asia, as I have noted, is large and growing. A tactical ballistic missile defense would help to discourage Soviet involvement in a Korean war, which I believe they aren't particularly anxious to get involved in anyway at the moment. But the existence of defenses that would be effective, even partially effective, against their growing tactical ballistic missile family would raise the threshold for their involvement in such a conflict, and therefore act significantly as a further deterrent.

And finally, while I do not have time here to develop this thought, we should not neglect the question that at some point in the future the U.S. might want to provide support to the People's Republic of China in a threatening conflict situation. That prospect seems remote today, but perhaps not as remote as it was six months ago. It certainly cannot be wholly dismissed in the long-run. And the provision of defenses to the Chinese may provide an option to the provision of offensive capabilities, which would certainly be of concern to some of China's neighbors. At least it is something to think about as we look to the future.

Mr. Hamm: Thank you very much, Mr. Sloss, for your systematic exposition of the subject. Lastly, we have Mr. McCormick talking specifically about naval strategy.

Mr. McCormick: As Manfred said, I was asked to briefly discuss the impact of the SDI and strategic defense in general on naval strategy and operations, with a specific reference to the Pacific Basin. Let me say at the outset that in dealing with naval forces, it is difficult to make any meaningful geographical distinctions insofar as these forces are mobile. And so what I have to say conceivably has to do as much with the Pacific Basin as it does really with Western Europe or the potential Third World contingency.

In looking at the issue of strategic defense, broadly defined, and its impact on naval operations, it seems to me that three important areas have to be considered. The first of these is the defense of our own, and the destruction of Soviet, satellite assets. The second is the potential need for a future defense against tactical ballistic missile threats, say within the next 15 or 20 years. And the third issue area that has to be investigated is

[5]The FROG is a Soviet short-range ballistic missile with a range of 19km-60km.

the collateral benefits associated with many of the technologies that will have been developed as the SDI goes through.

Looking at the satellite issue first, it is quite clear that today both our own and the Soviet navy depend heavily on maritime satellite assets for communication, navigation, surveillance, and targeting. Surveillance and targeting—these missions are particularly important, especially for the Soviet navy, and they will become increasingly important in the future. It is frequently assumed that the U.S. fleet depends more heavily on maritime satellite assets than the Soviet navy does. But I think one can argue at the present time that the reverse is the case. The Soviet navy, for a variety of reasons, is critically dependent upon ocean surveillance satellites. And as time goes on, it will become increasingly dependent on targeting satellites—using satellites for targeting purposes. The Soviet navy as currently configured is a relatively fragile force. It is designed for what Gorshkov has referred to as "the battle of the first salvo," and it is not an exaggeration to say that this is in fact the case. The Soviet navy is not in a position to fight and win a protracted conventional engagement at sea. It is important that at the outset of hostilities it be able to identify forward deployed forces, distinguish them from "spoofs" (or to make sure what it is seeing is in fact the enemy), and to accurately target those forces in a first salvo attack. One problem that they face is the fact that they are not in a position to really engage in what might be referred to as "multiple salvos." Most Soviet combatants are relatively small. The new generation of Cruise missiles are getting smaller also, but in the past, they've had the problem of having to depend on very large cruise missiles, and as a consequence they have had very few missiles in a ship load-out. They either will win quickly or they will not likely win at all.

Satellites today and in the future will consequently play an increasingly important role in providing Soviet naval planners with accurate intelligence as to enemy dispositions and accurate targeting data. In the case of the United States fleet, at the present time satellites are certainly important. We have not faced the same reconnaissance and targeting problems that the Soviet fleet has. Most of our reconnaissance and targeting assets have been a part of the surface navy. The carrier has the ability to identify the enemy and strike at 400 and 500 mile distances. This is less the case with the Soviets. As time goes on, however, and as the navy continues to face an increasingly long-range threat from Soviet naval forces, the early warning and the targeting information that satellites can potentially provide will be important for avoiding engagements if that is the navy's intention, and for preempting an enemy threat or for more

effectively defending against it, by getting good information concerning the parameters of the attack.

Over-the-horizon targeting will become an increasingly important goal for the U.S. fleet, particularly in light of the Tomahawk development. I might also add briefly, that the possibility is there for satellites to be used in submarine detection exclusively by non-acoustic means through identifying a thermal scar associated with an SSBN or identifying magnetic anomalies, turbulent wakes, or internal waves. These are various methods of non-acoustic ASW, and it may well be possible to use satellites in wide area submarine search in the future.

Now what does all this mean? What it means is that satellites are becoming increasingly important for ourselves, for the U.S. navy as well as the Soviet navy, and as a consequence of this it will become increasingly important to be able to defend our own satellites and to effectively operate against those of the Soviet Union. For obvious reasons, it becomes particularly important if satellite assets are used in wide area ASW search.

There is a second category of problem, and that has to do with the possibility of nuclear use at sea. For a variety of reasons, which I have gone into some detail elsewhere, one can make the case that a theater nuclear engagement at sea is a more distinct possibility than one on the ground. I will briefly go through the reasons for this as I see them and we can discuss this later, perhaps. One, the Soviet navy, as I suggested earlier, is simply incapable of fighting a protracted conventional engagement at sea. Two, for a variety of reasons, the Soviet fleet has a comparative nuclear advantage at sea against the U.S. navy. Three, the U.S. fleet is, in some respects particularly vulnerable to nuclear use. And four, one can argue that the threshold for nuclear use at sea is indeed lower than it is on the ground. You do not run into the problems of collateral damage; the only people that are harmed are sailors and warships. That is the object of naval warfare and nuclear weapons can do that much more effectively.

Now I know this is controversial, but bear with me for a moment. The Soviets have spoken about, and have indeed tested, the use of tactical ballistic missiles in a sea-strike role. I am particularly thinking of the SS-NX-13. This missile was never deployed but was designed as a submarine-launched ballistic missile with a range of between 400 and 500 hundred miles, to be used against surface groups, and, some have speculated, against submarines as well. In the Soviet literature you see frequent reference, particularly in earlier writings, to ballistic missiles in an area-bombardment mode. Now they have not solved the real time targeting

problem,[6] and they have confronted, as we have, continual problems with terminal guidance.[7] But this is a program which is being investigated and in the medium-term future, say in the next 10 to 20 years, this may be a threat that the U.S. navy faces. This is another area where naval strategic defense will come into play.

The third category of issues is the collateral technologies that will come from such a program—collateral uses of technologies that will be developed in any major strategic defense initiative. At the present time the U.S. surface navy, under the most optimistic conditions, faces an extremely serious problem with low level cruise missile attack. The navy itself admits that under the best of conditions, there are liable to be "leakers" in the face of any concerted attack into a carrier battlegroup screen. And if we are talking about nuclear weapons here, we can draw our own conclusions as to what the effects are. This threat is compounded by the development of smaller cruise missiles, which will give the Soviets a rapid reload and rapid refire capability. This problem might be solved through the use of a laser, and, in the future, particle beam technologies for conventional fleet defense.

I would add to these three categories one that Mr. Sloss alluded to, and that is the need for ballistic missile defense for forward bases, forward U.S. naval facilities in the Pacific and elsewhere, for that matter. Once again, if you look at it in terms of nuclear thresholds, one can argue that in the event that the Soviets were interested in keeping war as limited as possible, but interested in using tactical ballistic missiles, forward bases on foreign territory in the Pacific in particular might be a very real area where TBMs would be used.

The bottom line of all of this is that as the ballistic missile threat to the U.S. navy increases over time—and it almost certainly will as satellites become more important in our own and Soviet naval strategy and as the problem of fleet defense becomes more severe—a program along the lines of the SDI becomes increasingly important. I think the bottom line for the future is there is no alternative to an effective strategic defense if you are interested in operating a navy effectively in a high-threat environment. This is something that I think is going to have a major positive fallout on the fleet. Thank you.

Mr. Hamm: Thank you very much Gordon. The floor is now open for discussion.

Guest: You make some very interesting comments about Soviet use of

[6]Real time targeting is the ability to find and target high priority military assets promptly in response to changing intelligence data.

[7]Terminal guidance: a weapon's capability to lock on and guide itself to its target.

tactical ballistic missiles, but the Soviets have been looking at allocating portions of their strategic rocket force, not just the tactical ballistic, for well over a decade. There seem to be suggestions that the SS-11, perhaps model 4, and the SS-18 model 5, among other weapons, are dedicated, so to speak, to this barrage or satellite assisted targeting bombardment role. Secondly, one of the things that has struck me in looking at some of these issues is that the U.S. navy is extremely reluctant to move into an anti-tactical ballistic missile defense. It is not interested in lowering that particular vulnerability. I would like you to address whether in fact the Soviets currently are structuring their ocean surveillance and their Soviet Rocket Forces (SRF) command and control links as well as perhaps their missile submarine links for such a role. Secondly, do you see any potential shift of the navy, which seems to be obsessed with a 600-ship navy very much optimized for surface forces, towards some sort of defensive direction?

Mr. McCormick: Those are excellent points. The Soviets have been discussing this for a long time. I do not have any hard information on whether or not a portion of the SRF is devoted to this naval bombardment mission. It is difficult to say with certainty that it is. The Soviets have real problems, as do we. And their problems are going to have to be solved with real time targeting, and as I have suggested, terminal guidance of ballistic missiles. They experimented with this in the late 1960s, and up until 1973 with the SS-NX-13, and for one reason or another the program was stopped and none of these weapons were ever deployed. Now it is quite possible, however, that that is the case. Nonetheless I do not see that they need at the present time to devote a portion of the SRF to this mission, because if they are willing to go nuclear at sea, they can do so quite effectively without having to resort to ballistic missiles.

One of the arguments that I have made in the past is that one can envision a theater nuclear war engagement beginning at sea, with a simultaneous conventional engagement on the ground for a period of time. These are discrete theaters of operation and there are real differences between them. A ballistic missile strike at that point launched from ground bases, in particular, against naval targets could easily be misinterpreted, and given the high rate of alert the U.S. forces would be on at that time, it could lead to an overly negative reaction quite by accident. So the answer to the first part of your question is that I do not know for sure. There are good reasons to suggest not and even if it is the case they have real problems with targeting. My understanding of the capability of Soviet surveillance satellites at the present time is that it would take about 90 minutes to really integrate all of the data and then fire off a barrage. In

that time, sailing at 15 knots, a battlegroup can cover a great deal of territory.

Now the second point, I think is very telling. Why is John Lehman, and the Navy in general, not discussing the problem of theater nuclear use at sea? I think this is a real problem. It is a problem which I believe the Navy recognizes but does not want to talk about, at least not publicly, because it is a problem which is, for a variety of reasons, intractable. It seems to me that at the present time we cannot effectively or at least reliably defend surface groups against a concerted nuclear attack—quite apart from the ballistic missile problem, even a concerted nuclear cruise missile attack. As I suggested earlier, the Navy admits that under the best of conditions, there will be leakers, and it only takes one to destroy and disrupt a surface group. It is principally for this reason, I think, that the Navy is not talking about it. It is not exactly clear what you do about it. In the case of the Soviet fleet, and I am speaking a little bit in general terms, one can make the case that ultimately if the Soviets trade fleets, they win at sea. The Soviets are, from the point of view of individual combatants, as vulnerable as we are at sea. The difference is that they can sustain higher losses and still meet their mission requirements. The U.S. fleet, particularly in a major Pacific or West European engagement, would not only have to survive the sea control contest, but its ultimate mission is to go on and aid in the land war. The problem of survival under conditions of nuclear attack at sea for surface forces is at the moment something which cannot be handled reliably.

[Question Inaudible.]

Dr. Copper: The question was why did I assume, because the Chinese and the Japanese have not said that strategic defense will not work, that they are thinking that it will?

Well, generally the Chinese have been very frank in criticizing us, particularly since 1982. And in that context they did say something about the Soviet Union and the United States engaging in an arms race in space. So I would presume that along with that criticism, since they are being frank and this is in several articles in the *Beijing Review* and elsewhere, if they did believe this, they would have said so when they criticized the two superpowers engaging in an arms race in space.

The Japanese have been fairly candid on these things too, even though they are not on many other issues. Also I have come to this conclusion based upon the money that both countries are spending on space and similar things themselves: on technology that would go along with space weapons. This is not evidence that is very concrete. It is just a feeling one

gets when piecing things together about what the PRC and Japan are doing in terms of research and development.

Dr. Lewis: It is outrageous to make the statement that strategic defense will or will not work without asking what the defense is for, and what criteria are subsumed by the question "will it work?" And I will make two further comments. I for one am skeptical that the Japanese and Chinese think strategic defense will work to protect population. The other thing that is inappropriate to say, by the way, is that there is a "Japanese" or a "Chinese" view: there are obviously several views, as Dr. Copper has pointed out. The liberal press in Japan has taken one point of view, the government officials another. I think that there is probably considerable confusion over there, despite the fact that officials have been briefed by U.S. representatives on SDI. They are probably just as confused as the American public about SDI, because almost nobody ever asks the question: Work to do what? Strategic defense can have a broad range of possible objectives; some of which are quite difficult to achieve—like defending population—with others more easy, like the defense of missile silos (which doesn't mean the latter task is trivial). So I think that what we assume the Japanese and Chinese actually believe at this point in time has got to be a big open question.

Dr. Copper: Let me clarify what I meant when I said that the Chinese and the Japanese assume that this will work. I did not mean to say that cities can be protected. They cannot, because the strategic defense system will not stop chemical warfare or germ warfare and so forth. I do not think the Chinese or Japanese have any illusions about that. But in terms of the system working to stop missiles or aircraft, the Chinese and Japanese seem confident that it will. And also another way of measuring whether the system's any good or not is cost effectiveness, whether it costs more to build an offensive system that will penetrate or whether your defensive system is more cost effective. My evidence is rather fragmentary, but I think the Japanese and Chinese both are thinking the answer to that question is also yes.

Guest: What evidence do you have that Japan would be sympathetic to SDI?

Dr. Copper: Again my evidence is not all that good. I am to some extent speculating, but I can say several things regarding your question. One is that strategic defense is not nuclear, so I think Japan has the advantage of going in this direction, in that there is this nuclear phobia in Japan, and there are sort of semi-constitutional restraints in that regard. Also, in talking about the perspective of the Japanese people, there is clearly an awareness that Japan is a very crowded country, and vulnerable to attack

from nuclear weapons. Therefore, if a strategic defense system could be built that actually works, then you would be saving an enormous number of lives in the case of nuclear war.

Another point is that there is some reluctance on the part of Japan to depend so much upon the United States. That is discussed in top defense circles rather frequently, and I think in the direction of an independent strategic defense system, Japan has the advantage of not having to depend upon the United States so much. Then there is another issue related to that, and that is the U.S. bases in Japan. It has long been considered that these bases may invite Soviet attack, and therefore are doing more harm than good. The United States can counter that argument to some extent with a strategic defense system.

Spencer Johnson, Visiting Naval Fellow, The Heritage Foundation: I would like to offer several comments with regard to what Gordon McCormick had to say about tactical nuclear weapons at sea.

The Navy has been highly interested in nuclear warfare at sea for a very long time. You are right, we do not talk about it a lot. It does not pay to tell the opposition what you are going to do in advance. I would point out several things though. First of all, Gordon makes an assertion that any tactical nuclear war initiated at sea would stay at sea. And I think perhaps that is a false premise. I think that if the Soviets initiated a tactical nuclear war at sea, they would have no guarantee that the United States would keep a tactical nuclear war at sea. It could go ashore very quickly.

Secondly, the United States Navy is doing a great deal in terms of passive nuclear defense capabilities, including fleet dispersion and steaming formations. Unless a battlegroup is tightly packed and you use a very large warhead, you cannot get a battlegroup with a single detonation. We have done a lot in the way of shock testing. We are doing a lot in the way of EMP (electromagnetic pulse) protection of electronic systems in ships. We are putting a lot of effort into tactical nuclear war at sea. I might also point out that the modern cruise missiles which we are putting to sea, particularly Tomahawk, which went to sea this year, go in two versions: nuclear and conventional.

Just one last point. Gordon asserts that Aegis[8] is not very effective against sea skimmers. About a week and a half ago in the Caribbean, Aegis was extremely effective against sea skimmers in a jamming environment, which we reckon is about twice what a Backfire or a large-scale Bear air threat could pose against a fleet formation.

Mr. McCormick: I was waiting for you to say something. First of all I

[8]Aegis: an air defense system composed of radars and weapons currently carried on Aegis cruisers and soon to be deployed on DDG-51 destroyers.

did not assert that a nuclear war at sea would remain isolated to the naval environment. I suggested two things: 1) there are good reasons to believe that it could very well begin at sea and not on the ground; and 2) it would not necessarily begin with simultaneous nuclear attacks on the ground. And this is an interesting point. The Soviets have certain advantages in going nuclear at sea that they do not possess on the ground. It is quite true as you suggest, that they do not know what our response will be and, in fact, Secretary of the Navy John Lehman on numerous occasions has asserted that our response to a nuclear attack at sea would be to use nuclear weapons against Soviet positions on the ground. This assertion, in and of itself, suggests how vulnerable the U.S. Navy is to a tactical nuclear war. If we could deal with the Soviets tit-for-tat at this level at sea, we would not have to think about escalation to the ground. It may well be that, if faced with this dilemma, that would in fact be a response, but it would be a mistake from a political and military point of view. There is no advantage in going nuclear on the ground in response to a nuclear attack at sea. And because there is no military advantage in it, it is not a credible threat. However, that doesn't mean that we wouldn't do it.

Now as far was what the Navy is doing in the theater nuclear area, I am well aware that the Navy, particularly since the Chief of Naval Operations's initiative of four of five years ago, has redoubled its effort in this area. Between 1963, however, and the present time, with the exception of Tomahawk, which was principally designed as a ground attack vehicle, we have not deployed one new nuclear weapon. There are plenty on the drawing boards. There is a nuclear version of Standard,[9] there is a new stand-off[10] anti-submarine weapon that is being developed, we are even considering the development of a nuclear Harpoon,[11] and we are also considering the possibility of a nuclear Phoenix[12] air-to-air missile. Now the key point here is not that the U.S. Navy has or does not have nuclear weapons. We have had nuclear weapons at sea for quite a while. The point is that these nuclear weapons are, if you will, retrofitted on a force posture optimized for conventional operations, at least in the case of the surface navy. It is not at all clear to me that a navy such as ours

[9]Standard: A medium range ship-to-air or surface-to-surface missile used by the U.S. Navy.

[10]Stand-off: A weapon that can be launched outside the range of enemy defenses so as not to endanger the launching platform. For example, a B-1 bomber would launch its cruise missile (ALCM) from a position outside the range of enemy air defenses so as not to expose itself to attack.

[11]Harpoon: a medium to extended-range U.S. Navy air-to-surface or surface-to-surface missile.

[12]Phoenix: a long range air-to-air missile.

will be able to prosecute with equal success a theater nuclear engagement by simply possessing the weapons. Nuclear weapons in and of themselves do not make a nuclear warfighting capability.

As far as EMP goes, I think what you said is accurate. The Navy recognizes the problem, and it is doing a lot about it. It is still a big problem, however. The fact that we are simply investigating it does not mean that we have solved it. In fact, it suggests that we have not yet. Under certain conditions we have attempted to harden certain critical functions. The problems are: 1) It is very difficult to do that; and, 2) whenever you are talking about an EMP environment, you are talking about an extremely uncertain environment. You can imagine it is enormously difficult to test against EMP effects realistically. We can detonate a weapon, we can detonate a couple of weapons, we can replicate the effects on a small level. But extrapolating from this and coming to some conclusions about the invulnerability of our surface navy under conditions of massive nuclear attack is difficult to do. So we are dealing with an inherent problem.

As far as the Aegis goes, I didn't say it wasn't effective. It is certainly more effective than what we had previously. It does, however, have problems. And yes, it shot down a sea skimmer. But every time I read an article on the Aegis test, I ask myself, "Boy, I'd sure like to have more information concerning exactly how they went about testing." It is not good enough to say that we shot down ten out of eleven missiles. As Leon Sloss just pointed out, it means that one of them got through. If that was a nuclear warhead, it would have done a lot of damage. I do not have the test parameters in front of me, so I am not in a position to make an evaluation as to whether or not that test was done effectively.

As to the final point, as far as the multiple kill capacity of one nuclear blast is concerned, let me just leave you with this. The U.S. surface force is optimized for conventional operations because it is highly capable of operating in an integrated fashion; one system supports another. This requires systems and tactics that have been developed since the beginning of the Second World War; they have been brought to a zenith of capability today. It is a very effective way of operating. The fact is, however, that it requires not a high density formation, but certainly a formation which is moving perhaps a mile or two mile distance between warships. As you disperse, your vulnerability to conventional attack increases. It is true that the Navy has practiced over the years dispersal in the face of an anticipated nuclear attack. But in the event that they get it wrong and disperse, they are increasingly vulnerable to a conventional attack. This only illustrates my point that you have a Navy optimized for

the one type of scenario and not the other. As far as the multiple kill business goes, well, it is true that it would take a very large warhead to gain a hard kill on multiple combatants that were not spaced very close together. But there are various ways of disabling a surface warship without sending it to the bottom. One is to strip bare its outside sensors which are much more vulnerable to overt pressure than the ship itself, which is a fairly hard item. The other, of course, is the various collateral radiation effects associated with a nuclear explosion that will disrupt communications, sensors, and weapons systems and, as a consequence, degrade the capability of a fleet to defend itself even against a conventional follow-on attack. Admittedly, it is also going to disrupt the ability of the enemy to target your battlegroup as well for the same reasons. It is a very difficult question. It is very difficult to say when you get a couple of iterations down into the problem what the ultimate effect of nuclear use at sea will be. But it is pretty easy to say that 1) we are enormously vulnerable and, 2) it is only in the last four or five years that we have developed a renewed interest in this problem, even though the Soviets have had nuclear weapons on their warships since the mid-1950s.

Guest from Voice of America: When the public in some parts of the world thinks about Star Wars, they think about the use of lasers and other directed energy weapons to shoot down ICBMs in the boost phase. Much of what I have heard here in relationship to the Pacific area seems centered on tactical, intermediate range use of a BMD. Do I infer from this that in your collective view that aspect of SDI is of less relevance to the Pacific area than it is to Europe?

Dr. Lewis: You mean is Star Wars less relevant to the Pacific than to Europe?

Guest: That part of it which talks about using space-based lasers to shoot down ICBMs.

Dr. Lewis: I think this is the case for two reasons. First of all, it is a degree of "extended deterrence" which we try to reap out of our central systems; and more specifically from our ability to use these forces in limited attacks against military targets of great interest to the Soviet Union. In our strategy and planning, considerations about extended deterrence are much more oriented toward NATO requirements. The nuclear problem in the Pacific theater would, I guess, tend to be more of a tactical problem as opposed to a central strategic one. And the second point, and I am sure there are others, is that we have British and French deterrent forces that we must take into account if both sides decide to enhance their strategic defenses. We have to come to some agreement

with our allies before processes are set in motion that might undermine those independent national deterrent forces irretrievably.

Mr. Sloss: I think the impact on Asia or Europe for that matter, of a strategic defense which comes in many varieties as you have suggested, is both direct and indirect. We have tended to talk about the direct effect so far; that is, how might defenses deployed in the fleet, or in Japan, or Korea, or U.S. bases, how might these benefit our defense posture in the area or our ability to extend deterrence to allies. And much of the direct threat to that part of the world, although not all of it, comes from tactical missiles. There has been some discussion by the Soviets of possibly using strategic missiles against the Navy. I believe that if you could develop an effective boost-phase intercept system, it would have an impact. Boost-phase capabilities will be relevant against something like the SS-20 because the SS-20 in its trajectory comes up out of the atmosphere. You have got to react very quickly to get an SS-20, but in theory a boost-phase intercept system could work against the SS-20.

Of course, there is the indirect effect, which we have talked about less. But to the extent that the U.S. is better defended, it is more credibly able to extend a nuclear guarantee to third parties. It doesn't have to be, in my view, a perfect defense. I said I would elaborate on this a little more. It is my view that our defenses are far less than perfect, and I come to this view by having looked quite a bit over the last ten years at the targeting of U.S. nuclear forces. I put myself in the shoes of the Soviets and I see an American defense on the other side, which I am not quite certain how well it is going to work. I am not quite sure how the U.S. is going to deploy its defensive capabilities, and as a target planner I face considerable uncertainty, particularly if my objective is to attack a broad range of military targets rather than a few cities, which I think is the Soviet objective. Defense can introduce a great deal of uncertainty into the calculations of the offense, and if it does do that, it is going to increase deterrence, in my opinion. The situations in which we are likely to want to deter the Soviets are much more likely to be on the periphery. I would even argue that in terms of probability, a direct Soviet attack on the United States or Europe is very low. Where we are likely to get into some sort of a spat is in other parts of the world, including a lot of places in the Pacific.

Now if the Soviet confidence in their ability to attack the U.S. and achieve their objectives is eroded by the appearance of a defense, even a defense we think will work somewhat less than perfectly, then that is going to influence their ability and willingness to utilize their very significant military muscle. It is going to have an overshadowing effect on

other types of conflict. So I think we should not ignore that indirect effect, and that would apply to defenses of any type. I tend to talk about the terminal and mid-course defenses because I think that it is likely we would have such defenses earlier. However, there are boost-phase defenses that have been postulated that we could achieve, as I am sure some here would be able to describe better than I, that could be deployed in the next decade. So I do not think we should ignore the relevance of space-based technology.

Dr. Lewis: It is enormously important which technologies are selected for development. By definition, a space-based defense system covers the whole world. We do not want to get ourselves into a position where we have to make decisions about not defending some regions in order to save up expendable defenses to defend other parts of the world. One of the best ways of going through the defense is to exhaust it, making a hole in the constellation through which one can launch subsequently. Therefore, technologies that have expendable lethal mechanisms, like rockets or other kinds of kinetic systems, can be exhausted, forcing us into defense-coverage allocation decisions which wouldn't necessarily be the case when it comes to directed energy defenses. Under many circumstances, then, we wouldn't have to decide that we were *not* going to defend Europe or the Far East in order to save up weapons to defend ourselves. So it might be better to hold off on a decision to deploy a DABM system based on kinetic energy unless we can deploy so many of them that all conceivable defense options are covered.

Mr. Hamm: Are there any specific issues that would set the impact of SDI on the Pacific Basin apart from the impact of SDI on our relationship with Western Europe? We have heard a lot of diverse commentary from the Western Europeans and we will be dealing with that subject in the following session. However, for one or another reason, we have not heard much from the Pacific nations. Are there any issues that can be clearly identified as different so that the scenarios may not be comparable?

Mr. Sloss: The very fact that we have heard less from countries in the Pacific Basin may be significant. You have an almost automatic reaction in Western Europe to any issue nuclear, and we have over the last decade, at least. And as was pointed out, while strategic defense in many of its versions would not use nuclear capabilities, it is still a defense against nuclear weapons. And the kinds of reactions you get from Europe are almost predictable and stereotyped. I engaged in discussions with the British when we were talking about the deployment of the Safeguard system back in the late 1960s, and some of the commentary I see coming out of the United Kingdom today is verbatim what we were being told by the

British back then. Their concern stems in large part, though not entirely, from the impact that Russian defenses would have on their modest deterrent. I think one of the differences, then, may be that there are not so many preconceived notions out in the Pacific. There are not so many fixed views about defense. It is at least conceivable, as I have said earlier, that this will attract some attention in Japan, because of the industrial potential, because of the fact that it is defensive and many variants can be non-nuclear. I know there is a pervasive view among many Japanese that Japan cannot be defended. But maybe that attitude will change. So anyway there is one possible difference.

Mr. Hamm: Coincidentally, it is time to break. Let me thank the panelists for their insights. I think we have broken some new ground here.

Panel 6

Strategic Defense: Implications for the Western Alliance

Panelists:
Fred Leykam, Washington Defense Group, Inc.
Jeffrey Record, Institute for Foreign Policy Analysis
Steven Canby, Woodrow Wilson Center
Joachim Maitre, Boston University
Manfred Hamm, The Heritage Foundation

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The Louis Lehrman Auditorium
The Heritage Foundation

Bruce Weinrod: This is the last of our series of discussions on Strategic Defense, during which we have tried to explore the major implications and questions that have arisen with respect to strategic defense. We will be continuing our efforts in this regard very shortly with two debates and some further follow-up activities. This panel is to discuss the implications for the alliance and for Western Europe of a strategic defense approach to strategic doctrine and thinking and actual policy.

We will begin with Fred Leykam.

Mr. Leykam: In order to begin to assess the potential impact of the Strategic Defense Initiative (SDI) on strategic deterrence in the European context, it is necessary to define some key parameters bearing on the SDI in the context of NATO deterrence. These parameters may be summarized as follows:

- U.S./NATO nuclear weapons policy and its evolution;
- the SDI and its major goals; and
- some potential contributions to NATO security that could be provided by the SDI.

Any consideration of U.S. nuclear weapons policy in the NATO context must take into account the historical role of nuclear weapons in the Alliance. Nuclear weapons have served both military and political purposes within NATO since their introduction. They have been (and are currently) the focus of successive debates over the evolution of U.S.-European relations, the structure of deterrence, East-West relations and the roles of the individual European nations. Historically, the possibility of significant alteration in the shape or purpose of the U.S. and NATO nuclear weapons posture has evoked profound political attention in Europe.

Current NATO nuclear policy carefully integrates the political and military aspects of nuclear weapons. Nuclear weapons form two of the three legs of the NATO TRIAD (conventional, theater nuclear and strategic forces). Nuclear weapons serve several important objectives:

- they deter possible Soviet aggression in Europe through the threat of theater nuclear force (TNF) employment and the risk of further escalation through the linkage to U.S. strategic systems;
- nuclear weapons are visible symbols of U.S. political commitment and leadership of NATO and the defense of Europe;
- nuclear weapons serve as strong incentives for arms control; and
- nuclear weapons are symbols of Alliance solidarity through shared risk and responsibility.

In order to support these objectives, NATO doctrine has been developed in a manner that incorporates the concepts of escalation and linkage. These key doctrinal elements are central to doctrinal structure. Deterrence is seen to rest not on any one leg of the NATO TRIAD but on the possibility that all, up to and including U.S. strategic forces, might be called upon to support the others. For the Europeans, the notion of upward escalatory linkage put the primary responsibility for deterrence on the U.S.

When U.S. nuclear weapons were first deployed in Europe, the U.S. had unquestioned superiority over the Soviet Union in nuclear weapons capabilities. The doctrine of massive retaliation was strongly enunciated and the Soviet Union was seen to be in an inferior position relative to the U.S., able at most to use its conventional preponderance to hold Europe "hostage" against the use by the United States of strategic forces, while unable to threaten the U.S. itself. Counterforce attacks by U.S. strategic forces represented credible means to limit damage to the U.S. and its allies.

By the late 1950s, the Soviet missile development program had begun to threaten Europe and the U.S. by provoking debates about European vulnerability and the credibility of the U.S. deterrent. In response to the erosion of American nuclear superiority, the U.S. proposed a number of initiatives to demonstrate its leadership of the Alliance and reassure its allies of the credibility of its nuclear deterrent. These initiatives included the creation of the NATO Nuclear Planning Group (NPG), the development of the doctrine of flexible response (MC-14/2) and most recently the dual track, December 1979, force modernization decision.

In addition to initiatives in the NATO forum, a considerable focus of U.S. nuclear weapons policy has been on strengthening U.S. nuclear target (employment) planning and strategic force capabilities to support NATO in potential theater conflict situations. In this regard, the U.S. incorporated the concept of flexibility into its strategic target planning and established limited (Non-SIOP)[1] nuclear options. These limited options were intended to strengthen the linkage between U.S. strategic and NATO theater nuclear forces through greater integration of these forces in employment plans. Limited nuclear options were viewed as a more credible means of limiting damage to NATO and the U.S. through control of escalation and early war termination.

Despite attempts by the U.S. in both internal and Alliance planning to

[1]SIOP: The Single Integrated Operational Plan of the JCS that declares how nuclear weapons would be used and where they would be aimed in the event of nuclear conflict.

strengthen its nuclear deterrent contribution to NATO, the credibility of the doctrine of flexible response and the continued role and utility of nuclear weapons in the Alliance have become the subject of a heated debate. This debate transcends the issues raised by the implementation of the December, 1979 Long Range Intermediate Nuclear Forces decision and the collapse of the bilateral INF and START negotiations. The major issue facing the U.S. and the Alliance in the future centers on the maintenance of deterrence in the face of a steady (and accelerated) across-the-board buildup of Soviet nuclear and conventional forces. Whether flexible response and the traditional concepts of deliberate escalation and general nuclear response remain viable does not solely depend on actions taken by the U.S. and NATO.

Recognizing that Soviet actions in both the strategic and theater nuclear offensive forces, and defensive—active (air defense, ballistic missile defense) and passive (hardening, mobility, dispersal and deceptive practices)—areas posed a major threat to the continued maintenance of deterrence, President Reagan proposed a shift away from deterrence based on the threat of retaliation, to a posture based on a deemphasis of the role of nuclear weapons and emphasis on active and passive defenses. The focus of the President's proposal was on the threat posed by ballistic missiles, although it is recognized that other defenses (i.e., air defenses) against non-ballistic threats would be required. Such a "defense emphasis" posture would serve several purposes:

- provide a defense of the nation that would save lives and protect the military forces central to the preservation of U.S. and Allied security;
- reduce the likelihood of war and thus improve stability; and
- reduce the value of offensive forces and provide incentives for arms control.

As discussed in the previous panel sessions, the Department of Defense conducted a major study effort in response to the President's speech. Many of the major conclusions of this study effort have been made public. The major recommendation of the study was the establishment of a strong long term research and development effort that would support demonstrations, decisions, and if the technology warranted, deployments of strategic defenses. Key to such a defense "system" would be the notion of a defense indepth. The defense indepth concept provides for a multi-layered system whereby ballistic missiles (or the reentry vehicles) would be intercepted in the boost, post-boost, midcourse, and terminal stages of the missile's flight trajectory. The promise of boost-phase intercept and more economical

intercepts of RVs in midcourse and terminal phases prompted the Defense Technology Study Team (DTST) to conclude that "powerful technologies are becoming available that justify a major technology effort, offering future technical options to implement a defensive strategy."

A Strategic Defense Initiative Organization (SDIO) has been established to conduct the long term research and development effort. The SDIO's Director, Lt. General Abrahamson, has stated that the SDI Program (SDIP) is not just oriented towards the development of defense of the United States, but our allies as well. The highly effective, reliable and militarily relevant defenses being pursued under the SDIP could provide important contributions to the NATO Alliance's deterrent and defensive doctrine and posture. While the specific impact of the SDIP is impossible to define at this time (as the program is still in development), the general contributions of the SDIP to Alliance security can be identified. Continued refinement and study of the potential role and utility of defenses in the NATO context will be important to the development and maintenance of strong European support for the SDI.

The potential contributions of the SDIP to NATO security include the following:

- Effective defenses could play an essential role in reducing reliance on threats of massive destruction while offering new opportunities to couple the "defense" of Europe to that of the United States.
- Defenses could greatly reduce Soviet confidence in achieving their attack objectives.
- Defenses could support non-nuclear deterrence through protection of key NATO main operating bases.
- Defenses could save lives. In the event of a failure of deterrence, the presence of active and passive defenses in both the U.S. and NATO Europe could greatly reduce collateral population fatalities.
- Most importantly though, effective strategic defenses could raise the nuclear threshold[2] to a level where the utility of offensive nuclear weapons in contributing to U.S. and Allied security was greatly limited.

As I have noted earlier, the SDIP is currently a research and development program, and as such, there is a great deal of uncertainty associated with it. This uncertainty derives from the fact that at this time we do not

[2]The nuclear threshold is the point during a conflict at which, the line between conventional and nuclear war is crossed.

know which technologies might ultimately be selected to build our defense system. Hence, it is hard (but not impossible) to assess the specific policy and political impact of the SDIP on deterrence in the NATO context. The next several years should be very interesting as we begin a detailed analysis and assessment of the role of strategic defenses in U.S. and NATO security policy. Thank you.

Mr. Weinrod: Our second panelist today is Dr. Jeffrey Record.

Dr. Record: I am going to make some brief remarks on the political dimension of strategic defense insofar as our allies in Europe are concerned. Let me start out by saying that I am not a technical expert, nor am I excessively knowledgeable in the issues of strategic defense. I am generally skeptical of some aspects of the Strategic Defense Initiative, as well as some of its ultimate potential operational implications. My problem is that of most defense analysts when dealing with nuclear weapons or questions of nuclear strategy—we have no historical reference experience upon which to make any reasonably confident judgments about what a nuclear war is going to look like, how it will be fought, or how long it will last. We know very little, in fact, about nuclear war. We know a lot about nuclear weapons, but we know very little about nuclear war. And that is why nuclear strategy, or what passes for nuclear strategy, is to a large extent theological in nature, because it rests upon fanciful speculations and untested hypotheses. This is not to say we shouldn't continue to think about it.

So far as Europe is concerned, logic alone would suggest that any measure taken by the United States, be it the SDI or any other measure, that would effectively reduce the vulnerability of the American homeland to a Soviet nuclear attack ought to be welcomed by our European allies because, presumably, that reduced vulnerability would enhance the credibility of our strategic guarantee to Europe, such as it is. Unfortunately, NATO European attitudes about things nuclear have rarely been characterized by logic or a willingness to think beyond deterrence.

So far as strategic defense is concerned, and especially the Strategic Defense Initiative as enunciated by the President in his March 23, 1983 speech, American policymakers face in Europe the very, very difficult challenge of trying to convince the Europeans of something that they have always believed to be incredible—namely that there is or can be an effective defense against nuclear attack. We are going up against 40 years of received wisdom, not just confined to Europe, that there is no effective defense against nuclear weapons. To the same extent, the British public and the British government at one point in the 1930s were convinced that there was no effective defense against the manned bomber.

Now, we are not only going up against rejection of the idea of there being an effective defense against nuclear weapons. That attitude is also joined by others that are equally antagonistic to the concept. Not the least of them is that the Europeans are wont to regard any major change in American strategic nuclear doctrine or an American strategic nuclear force structure as inherently destablizing. They believe that what has worked for 40 years has got to to work in the future, that "if it ain't broke, don't fix it." And they, much less so than we, have been unable to discern any broken bearings and pistons in what we have relied upon for the last 40 years as a deterrent posture.

They see "Star Wars" as not only destabilizing but also as very costly. No one has really put a price tag on it, but I think everybody assumes that there is going to be a major bill due if it works. Any money we spend on nuclear forces in general, and certainly in a major strategic defense initiative of the kind proposed by President Reagan, will be money that by definition will be unavailable for Europe's conventional defense, which now seems to be the latest fad.

They also see it as torpedoing prospects for arms control. They're already pretty much depressed by the rather low state of U.S.-Soviet relations, and certainly the lack of progress with respect to the number of arms control initiatives that we have been pursuing over the last several years. They tend to view strategic defense for the United States, if it's for the United States alone—and the President said very, very little in his March 23rd speech of extending this to Europe—as undermining the U.S. strategic guarantee. They tend to see a strategic defense for the United States alone as inherently decoupling what is left of the credibility of the American strategic guarantee to Europe. They're already suspicious that the Americans have embarked upon a very sly way of decoupling Europe from the U.S. strategic nuclear deterrent. Much of the European opposition to General Rogers's follow-on forces echelon- attack plan, the so-called "deep strike" strategy, is born of the suspicion that the Americans intend to fight a war in Europe, but only in Europe, and not a war that would engage the United States itself.

For the British and the French, obviously, there are real problems. A strategic defense that were to prove effective, eventually if the Soviet Union were to achieve similar defenses, more or less eliminates whatever credibility their own independent deterrents now have. Finally, they share the doubts of many Americans about the technical feasibility of strategic defense . They are led to believe, I think mistakenly so, that what is being proposed is something that we are going to deploy within the next six or eight weeks. They do not understand that the Americans now are at a

stage in which we are simply trying to answer technical questions, that we are years and years away from being able to have the right kind of data even to be able to make a decision with respect to what kind of strategic defense we would like to have.

As for INF forces, I do not think that even a technically feasible "Star Wars" strategic defense would have any immediate or significant bearing upon the current and future balance of theatre nuclear forces in Europe unless, of course, those defenses could be effectively extended to cover NATO's own theatre nuclear forces. Those forces are very vulnerable to preemption. They will continue to be vulnerable to preemption whether or not the 572 missiles are deployed. I assume that most of them will be. The INF modernization decision of December, 1979 did not address the key issues related to pre-launch survivability. We simply added a bunch of new missiles there that are almost as vulnerable as the ones that they are designed to replace.

In any event, the political barriers to attempting to extend even a workable strategic defense to the European deterrent would be, I think, almost insurmountable. Let me say in closing that one of the areas where I think we could help ourselves a lot with respect to turning the Europeans around, at least on the preliminary stages of investigation of this whole issue of strategic defense, is to emphasize to them that an effective strategic defense in the final analysis depends upon some kind of restraint, negotiated or otherwise, upon the size of opposing offensive forces. It can and has been argued, by Colin Gray among others, that some kind of restriction on offensive strategic forces is a prerequisite for an effective strategic defense. In other words, that arms control is a necessity for strategic defense, not a substitute for it. If that is in fact the case, and I am not willing to necessarily cast a definitive judgment on it because I have not looked at the technical aspects of it, that is one of the arguments that we should be making with the Europeans.

Up to now the Strategic Defense Initiative has, in large measure in much of Europe, been perceived as a unilateral American escalation of the arms race, as being part and parcel of a general disintegration of détente, and as anti-stability and as anti-arms control. I do not think that's necessarily the case, but so far as I know we have not made the contrary argument and certainly not effectively with our allies. Thank you.

Mr. Weinrod: Our third speaker will be Dr. Steven Canby.

Dr. Canby: I would like to add on a little bit to what Jeff said and then my main pitch is on the conventional emerging technologies. I would like to argue that, just to begin with, the SDI initiative is very, very expensive. And if we are not careful, between the medical and defense industries, we

will not have any GNP left for anything else. If one looks at the technical problems as Jeff mentioned, it is highly questionable whether SDI will work. And if both sides—and we are talking about in Europe—if both the U.S. and the USSR had strategic defense not only would it cost much more, but also from the European viewpoint, deterrence would be degraded sharply, because it means there is no deterrence other than conventional forces.

I would argue that there is another way to strengthen deterrence other than SDI. And that is by looking critically at the nature of our conventional forces. We should not accept them as given. We should ask institutionally embarrassing questions. We do not need to make up for the grave deficiencies in our conventional forces with nuclear weapons. Our weakness is purely self-inflicted.

When we look at our conventional forces, it is not a question of technology. Our problems really stem from the fact that our strategy has no content. Everybody has a strategy, but strategy may or may not have content, and ours does not. And our conventional forces are extraordinarily expensive. It takes us five times as many people to man our aircraft as other air forces and it takes us three times as many people to man our divisions as other people. And we are supposed to be capital intensive and have high-cost labor. Therefore, something is wrong with the way we use and organize our conventional forces.

Moreover, we consistently misuse technology. A case in point is the emerging technology for Europe, often called "Air/land Battle of 2000," or the Rogers Plan, or the follow-on force attack. Why are we misusing our technology? If you accept the validity of this thesis, of course there are serious policy questions of technology transfer, because technology is supposed to save us from the Russians. Obviously you do want technology transfers among the allies. There is a question of how we are going to share arms production with the Europeans to preempt the theme that it is just another American gimmick to sell high technology to them. There is a question of crisis stability and deterrence and an idea of a shift in strategy from defense to offense. However, these questions are moot if deep attack is operationally infeasible in the first instance. And I will explain why deep attack, even if the technology works, which it does not, cannot even be done in principle.

The military argument of for deep attack is that NATO's forward forces can hold front line Warsaw Pact force, but NATO cannot match subsequent incoming Soviet reinforcements. If these reinforcements could be destroyed in route, or significantly delayed through the use of high-technology weapons, Warsaw Pact forces could be held and possibly

defeated piecemeal. This argument, however, is derived from an incorrect understanding of Soviet operational methods. It is the high-quality lead echelons and not the low-quality follow-on echelons that must be stopped from enveloping, not assaulting. Armored forces other than in the American army do not assault, they envelope, defending formations.

The second argument is that American technologies that perform deep attack of follow-on forces are not operationally up to the task. Now specifically what I am arguing is that the new technologies, as for instance argued in the little blue book from the NATO "wise men"[3] have been undercosted by an order of magnitude. The concept stems from a false syllogism and the concept itself is not operationally feasible. Technical and operational feasibility are not synonymous. The concept has yet to be demonstrated in a benign environment, much less in a realistic or a dynamically hostile one, i.e., where the enemy tries to react against you. The deep attack system will be vulnerable to attack, can be jammed and spoofed, and its various functions have yet to be stitched together. Some of its deficiencies can be corrected with time and money. Others cannot be corrected. The vulnerabilities deep attack presumes and the opposing force array do not exist. Its automated command and control leads to deception and inflexibility and its subminitions can be easily countered. In fact, just on the submunition itself, probabilities of hit are approaching random, which is nearly zero, and kill possibilities are approaching zero too. And there are reasons why.

Then let us look in principle, even if the system did work, does that mean that deterrence would be strengthened? Even a workable concept does not necessarily enhance deterrence and stability. If the system is deployed, NATO could be weakened conventionally if resources are siphoned from forward forces, which of course will happen. Should the Soviets conclude the system is effective, i.e., the technologically superior West must know something that the Russians do not, the obvious counter is a preemptive surprise attack. So crisis stability is down.

In addition, the same infrastructure and missiles are used for holding the second echelon at risk with nuclear weapons as for holding the second echelon at risk with conventional submunitions. The Soviets could logically conclude the system is a mere Trojan Horse for nuclear weapons and that NATO has, in reality, returned to a trip-wire[4] strategy. In other words, I would argue that no matter how you look at it, we have a real

[3]*Strengthening Conventional Deterrence in Europe; Proposal for the 1980s,* Report of the European Security Study, ESECS (New York: St. Martin's Press, 1983).

[4]A trip-wire strategy calls for an immediate tactical battlefield nuclear response in the event of a Soviet attack on Europe.

problem with deep attack. It does not work and it will end up lowering deterrence.

Mr. Weinrod: Continuing the discussion is Dr. Joachim Maitre.

Dr. Maitre: Thank you. Dr. Record has said a great deal about European reactions. I would like to add one aspect. Western European apprehension about Project Star Wars is partly based on the disbelief that the Pentagon will ever be granted by Congress the financial means to fund it. After all, so the critics argue, the United States, while recognizing the Soviet threat from space, seems to be quite unwilling to perceive the danger of local wars right on their doorsteps. And though Americans who do recognize the threat on their doorsteps are frustrated in their attempt to counter it, they tend to remove themselves from present reality into imagined future conflicts in space. Star Wars is seen by some, not just in Europe, as a cop-out, while San Salvador remains unattended.

Europeans are not as negative about technical possibilities in Project Star Wars as some over here seem to believe. Europeans, as do Americans, know that scientists will be debating for a long time to come the feasibility of this or that system, its reliabilities and costs. Much is technologically achievable—if financially unaffordable. The programs, political and psychological spinoffs, and the repercussions on strategy are less clear. But a few conclusions can be drawn after a year of debate here and in Western Europe.

Four years after NATO's crucial dual track decision, the alliance strains under quasi-neutralist tendencies of several member nations. Centrifugal forces threaten NATO's cohesion at a time of growing Soviet global ambitions. Given the Soviet Union's new and impressive capability for projecting military power globally, the original concept of NATO's posture has outlived itself. NATO will have to widen its scope, revise its strategy and expand its operational area—or it will self-destruct.

The trans-Atlantic debate over "Star Wars," which has not even started in earnest, takes place at a time when NATO should look at itself and look at particular options. It has been pointed out right here at this table that options are available. At the same time, Europeans are always claiming that after all, "we've enjoyed 40 years of peace, NATO has worked." Therefore, Europeans are quite unwilling to change NATO.

West German Defense Minister Manfred Wörner, a very staunch supporter of NATO and himself a former Luftwaffe pilot, has said time and again: the Bundeswehr will not be deployed outside Western Europe, outside the present NATO scope. Also, Americans must not be allowed to withdraw one single soldier from Western Europe. In other words, West Germany would like to have it both ways. This particular psychology of

selfishness, as one should call it, is right now becoming apparent in the debate over Star Wars.

Not surprisingly, the most negative reaction to Star Wars comes from Bonn. It is now obvious that the Bonn government will soon embark upon a campaign to fight Star Wars jointly with France and perhaps England. In the course of doing so, Bonn wishes to lay the foundation for a semi-autonomous European defense within NATO. Chancellor Kohl has had talks on this issue with President Mitterrand. He sees France as a central partner for a European defense strategy. Kohl hopes to soon include Britain in his talks. Kohl has indicated that he feels or even fears that the American anti-missile program could become irreversible if President Reagan is re-elected for a second term this coming November. By 1988, so the German press has been told, between $50 billion and $60 billion will have been spent on Star Wars R&D, too much for any new administration to cancel the project. The West Germans clearly fear that a space defense program will protect only the U.S. As has been said by Dr. Record, any such system would decouple Europe's security from America's and thereby undo the political advantage which the installation of GLCMs and Pershing IIs had been meant to bestow. Bonn is also concerned that the American program may upset the Euromissile deployment program at a time when the Dutch and Belgians are undecided.

Another staunch ally and defender of NATO, a member of the Christian Democratic Union, Dr. Alois Mertes, Secretary of State in the Foreign Ministry, said in mid-April: "If both superpowers protect their own sanctuaries only, Europe will be more vulnerable. It is a classic case in which a united Europe could and should influence the U.S." Manfred Wörner, the Defense Minister predicts that Star Wars could be NATO's dominant theme in the coming years. "It will undermine European security. It will destabilize the East-West balance. It might even split the Western alliance." Germany's Social Democrats, now in opposition, are even more outspoken on the issue of missile defense. Karsten Voigt, also a defense spokesman, predicts a massive conflict between the U.S. and West Germany if the U.S. killer-satellite program is carried out.

To end on a positive note: the one European politician who is a statesman in Western Europe right now is Francois Mitterrand, who is very close to President Reagan in his defense views. Perhaps Mitterrand, as he has done apparently over the last six months on other matters, might be able to turn the mood in Western Europe.

Mr. Weinrod: To wrap up the discussion part of the session is Manfred Hamm, Senior Policy Analyst at The Heritage Foundation.

Mr. Hamm: I was asked to comment on the preceding presentations,

which is not an easy task, considering the broad territory covered by the panelists. Let me begin by saying that I do not share the gloomy picture painted by Joachim about the current state of European attitudes toward defense in general and the Strategic Defense Initiative in particular. His remarks demonstrate that Germans can be as self-excoriating as Americans habitually are when they talk about the policies of their government.

Nobody really expected an enthusiastic response to President Reagan's Strategic Defense Initiative from our European allies. Indeed, the reaction was quite negative, but so was the response by broad segments of the scientific and arms control community in this country. There are a number of reasons for this European response:

First, of course, the Europeans were taken by surprise as everybody else outside the close circle of advisors in the White House. They had not received advance notice as is customary in the case of major policy pronouncements by the U.S. President. It is thus not astonishing that they were somewhat irritated by the dramatic announcement.

Second, as was noted by Jeffrey Record, the speech did not contain any reference to Europe and the implications of the SDI for NATO deterrence and defense. But the President spoke in very broad terms, he did not endorse any specific technology nor, for that matter, was he very precise on the scope of the initiative other than to state its ultimate objective.

Third, the thrust of the President's challenge to science and engineering, ran counter to forty years of established wisdom that defense against nuclear attack is impossible. Jeffrey Record rightly emphasized this point. But again, the Europeans did not react much differently than many American pundits.

Fourth, Europeans are politically wedded to the doctrine of flexible response and they reject impulsively anything that might imply a change in NATO strategy. The controversy over NATO deployment of INFs in Europe is a case in point. It epitomizes European anxieties over any change in the U.S. nuclear doctrine and force posture.

Fifth, due to their infatuation with arms control as a substitute for armaments and its role in detente—this attitude is incidentally shared by many Americans—the Europeans are extremely sensitive to anything that might jeopardize prospects for arms control. The ABM Treaty is the last surviving element of superpower arms control and detente and is considered here as much as there almost sacrosanct.

Sixth, in the same vein, they were already besieged by the divisive debate over deployment by NATO of U.S. controlled INFs in Europe. Naturally, the last thing European governments desired was a new controversy on strategic defense which, admittedly, is viewed by many

over there as just another unilateral escalation of the arms race by the U.S.

Seventh, the Europeans have long been concerned about a reshaping of U.S. global strategy affecting their security. One need only recall that it has become fashionable to talk about the growing economic, political, and security interests of the U.S. in the Pacific basin to grasp latent European anxieties about a weakening of the U.S. commitment to the security of the old continent.

Finally, and I deliberately mention this last, Europeans were alarmed by what SDI might signify for their security. To some, SDI conjured up images of a "Fortress America", to others it was evidence of a U.S. desire to limit a war to Europe, thus confirming latent suspicions about intentional decoupling. Some regarded it as pie in the sky, a technologically impossible dream while others expressed concern over the financial ramifications SDI might have for the U.S. contribution to the conventional defense of Western Europe.

For all these reasons, and one could think of many more, the Europeans as a whole were less than enthusiastic about the SDI, although I have seen quite supportive comments in conservative papers over there. In fact, it appears that once they understood that SDI was a long-term research emphasis rather than something to descend on them within a few years, they began to take a more sober approach to the entire issue.

This observation seems to be contradicted by Manfred Wörner's recent interview to the *Hanoverische Zeitung* which was mentioned by Joachim and has made such waves on both sides of the Atlantic. It has been touted as the definitive European response to SDI, which it certainly was not, if one can ever legitimately talk about *a* European response. Furthermore, it seems, the remarks by the West German defense minister do not even reflect the position of his own government. I suppose Mr. Wörner got carried away and he is known for changing his mind; only remember his exuberant support for "deep strike" and "ET"[5] a few years ago while he was defense spokesman of the opposition and contrast it with his much more cautious, if not negative attitude, toward the idea today.

In the few weeks since giving the interview, Mr. Wörner has beaten a slow but persistent retreat from what was quoted in the papers. He has

[5]The term "emerging technologies" refers primarily to novel applications of advanced information processing to battlefield systems, but also includes development of improved conventional munitions with computer-assisted guidance systems. NATO agreed in April, 1984 to explore the utility of "emerging technologies" in eleven program areas, mostly in the area of surveillance and target acquisition as well as electronic C^3I and countermeasures.

refined his terms, has charged that he was quoted out of context and has clarified some of what he had said. Also, if one is to believe the recent press coverage of the visit by Hans Dietrich Genscher, the West German foreign minister, at the White House, he reportedly assured the President of West German support for the SDI project. In turn, he was reassured by the President that defense against lesser than ballistic missile threats of particular concern to Europe will be given equal priority. This has recently been reaffirmed by the SDI Project Director, Lt. General Abrahamson, as Fred Leykem noted a minute ago.

It is too early to tell whether SDI will become as divisive an issue as NATO INF deployment which could conceivably split the alliance. Joachim Maitre correctly mentioned the statement by Mr. Karsten Voigt, the SPD defense spokesman, who claimed that the debate on SDI will dwarf the controversy on INF. Much will depend on the international climate at the time we will move toward a deployment decision. Many of the assumptions dominating the public agenda on war and peace today may be no longer with us in the late 1980s or early 1990s; for instance, only within the last year has attention been focused on the scenario of a nuclear winter which, if correct, makes a strong case for space defense against nuclear weapons. The technological evolution will also shape perceptions about the feasibility of defense. What may appear utopian and undesirable today may be considered feasible and, in fact, desirable tomorrow. Finally, the way the SDI is managed in terms of public diplomacy will have a decisive impact on whether it will become as controversial as many anticipate today.

Let me turn now to some substantive issues relating to SDI and its effect on Europe. Both Jeffrey Record and Fred Leykam pointed out that, on logical grounds, the Europeans should welcome the diminishing of U.S. vulnerability to Soviet attack. Both rightly identified European unwillingness to think beyond deterrence and to contemplate actual warfighting in the nuclear age as being at the heart of European reticence to accept the notion of defense.

In the 1960s, the credibility of the U.S. commitment to strategic nuclear escalation diminished as continental America became vulnerable to Soviet retaliation. NATO tried to come to grips with this problem through various schemes, like the aborted idea of a multilateral force, but the nuclear dilemma was never really resolved. Even such responsible, pro-alliance people as Henry A. Kissinger have called attention to the credibility gap inherent in current NATO strategy; recall the thesis of his 1979 address in Brussels which he repeated in his recent article in *Time Magazine*. But what is a credibility gap for some is cause for suspicion for

others; witness again the INF debate. Following the logic of Pierre Gallois, France opted for a national nuclear deterrent as ultimate guarantor of its security.

Even with only partial protection, U.S. willingness to risk nuclear escalation will certainly be enhanced, both in the eyes of the Europeans, which will strengthen alliance cohesion, and in Soviet perception, which will bolster deterrence. But there is one more aspect to it which has not been mentioned here. The U.S. landbased retaliatory capability is precariously vulnerable to a Soviet preemptive first strike today. Limited and preferential defense of U.S. nuclear forces would yield four direct benefits for NATO. First, there would be some assurance that the U.S. will have the capabilities necessary for retaliation after absorbing a Soviet first strike. Secondly, Moscow would no longer be assured of its ability to execute a disarming first strike. Third, and this is a corollary, Moscow might be forced to adopt a countercity strategy which would trigger full-scale U.S. retaliation. Lastly, crisis stability will be strengthened as the feasibility of a successful first-strike diminishes. If I am correct, even limited defense confined to the U.S. would vastly enhance deterrence of Soviet attack.

It is often said that SDI will spell the death of flexible response. I would like to take exception for two reasons: It presumes that flexible response is alive and well; it is not. The doctrine was either obsolete at the time NATO adopted it in 1968 or, even worse, it has always been a political doctrine devoid of military content. Being the pessimist that I am, I submit the latter is probably true. Secondly, despite all the emphasis on raising the nuclear threshold through improvements of NATO's conventional defenses, and Steven Canby disputed the feasibility of some of fancier ways of doing so, I am not convinced we can animate flexible response without strategic defense. Perhaps unintentionally so, Steven Canby has made, I think, a persuasive case for strategic defense.

Let me elaborate on this by introducing two more points: One is that NATO conventional assets are highly vulnerable to Soviet preemption, conventional or nuclear. So if we surround these depots, ports, airfields, and C^3I installations with air defense and terminal missile defenses—a modified Patriot ATBM has been mentioned as possible candidate at the NATO ministers conference at Cesme, Turkey in April—then we would go a long way toward improving our conventional staying power in Europe. Incidentally, this can be done without violating the ABM Treaty.

My second point is that NATO strategy is now predicated on reinforcements from the continental U.S. There are two aspects to this: Reinforcements would initially have to come from existing weapons stores, but if most of them are destroyed in a Soviet preemptive strike against the U.S.,

there will be little left to ship to Europe. Second, the chaos engendered by a nuclear attack would probably paralyze U.S. society. Again we see the virtues of even a limited SDI.

Now let's presume NATO defenses collapse in Europe and the West would have to mount a Normandy style invasion. Steven Canby brought up indirectly that Moscow is not capable of fighting a protracted war. In such a war the advantage shifts decisively to the West, provided it can mobilize its vast industrial resources. But if the U.S. industrial potential is devastated by a massive Soviet nuclear attack, there will be little to mobilize with. The protection of U.S. industrial assets is thus elementary and SDI may well make this feasible in the longterm. The prospect of a long conventional war, consequently, serves as a powerful deterrent of Soviet attack. Instead of making Europe fit for conventional warfare, SDI can contribute to its deterrence.

I would like to conclude by briefly addressing the issue of financing. Here the Europeans have a real point. Some of the money for SDI, once it goes into full development and deployment, will have to come from existing programs, including conventional defense. This will have an effect on the U.S. contribution to the conventional defense of Europe and require compensatory measures by the Europeans. But European objections to higher defense spending is a phony reason to invoke against the SDI. In fact, one could make the opposite case: Given the fact that NATO will not devote the resources required for a viable conventional defense, SDI with its potential to strengthen deterrence of conventional and nuclear war may well be a cost effective way to enhance alliance security. Thank you.

Mr. Weinrod: Thank you very much Manfred. If any of you have any brief additional comments, I will go back in the order in which you spoke.

Dr. Maitre: The Patriot was mentioned. At the NATO Nuclear Planning Group Meeting in CESME, Turkey, Secretary Weinberger let the Europeans in on "Star Wars." And the mistake was made right away of introducing Patriot as an interim solution for a tactical anti-missile system. The Patriot does not have a good name in Europe. It doesn't have a good name here either. To designate this particular weapon—that is called the "Edsel" by various newspapers in Europe—a future tactical anti-missile was, I think, a tactical blunder.

You asked: "What are the alternatives?" Clearly, the modernization of NATO. I think President Reagan has lost a great chance by being indifferent to the Europeans. They have always been allowed to live a rather pleasant life while the Americans were cradling them. Remember the Irving Kristol quote from 1979, that the West European nations had

given into the tempting spirit of social democracy while copping out of world politics. President Reagan could have said "We now have a new military strategic situation. Help us out." The response, you remember, over Grenada was negative because Europeans were not used to that kind of thing. Had he said, "Now you take care of your oil supply lines. The Sixth Fleet will remain in the Med. However, I want to see four German destroyers in the Mediterranean as well. I would like to have a small carrier built or bought secondhand from the British. The "Hermes" is for sale and might not go to Chile, why does the German Navy not buy one, put 16 Sea Harriers on it (they are available, the Germans have the money, too) and help us out wherever the need arises?"

Manfred Wörner has said that deployment of German forces outside the European area is against the German constitution. Not true. No such paragraph is in the German constitution. But here again the Germans, we the Germans, have been getting away with rhetorical blackmail. We must adjust the scope of NATO. It's imperative that we do so because the Russians have expanded. When the Soviet Union in 1949 saw the creation of NATO, it created the Warsaw Pact. Now, of course the Soviet Union is a global power. NATO clearly is not. We have not followed the Soviets, only the Americans have.

On protesting Star Wars: it is really not a deep-felt protest. I'm quite sure of that. Europeans know very well that under Reagan the American stance has improved. However, they do not know the consequences; they have misgivings. America's present role in Central America indeed is not reassuring. Yesterday, perhaps, was indicative of a major change—that 212 to 208 vote in Congress on military aid to El Salvador. Finally, some real support will be granted to a democracy which has a very good chance of making it provided the U.S. means business. And only then will Europeans again fall into line. They have always been impressed by American power. Any nation is impressed by power. But if you are faced with an ally who has teeth and is unwilling to bite, you tend to become rather weak yourself. That has been the history of NATO between 1970 and 1980. No reason to continue that tradition.

Mr. Hamm: May I just make two brief observations. The first is that I do not think the Europeans respect power. I think they are intimidated by it. And you provided all the examples and the indicators of European behavior that shows how they are intimidated by Soviet power.

The second observation: of course, to raise to a policy level, a high level, the issue of enhancing the Patriot was not a good idea. One should have looked into it first. I have heard reports that depending on the angle and the range at which it is fired, its kill probability could go down to zero. So

I am not certain that Patriot is precisely the answer. The only point that I tried to make was that we should not assume from the outset, as it is often done in discussions, that intermediate range or short range threats cannot be dealt with. The *a priori* exclusion of solutions to such threats, I think, is unwarranted, since we don't even know what technological opportunities might arise in the future.

Dr. Record: I do not know anybody on the panel who suggested that they cannot be dealt with. I never used the term Anti-Tactical Ballistic Missile and never suggested that I was skeptical with respect to ATBMs. My only problem is that if you try to deploy ATBMs in Europe, you are going to face the same kind of political barriers that agonized the alliance for five years over the 1979 decision. Whether they are nuclear warheads or not, it is still something to do with nuclear weapons and it scares our allies.

Mr. Leykam: I would like to emphasize a key point, at the risk of it having already been made before I arrived here today or in earlier sessions. This panel has done a good job of pointing out some of the major political, military, and economic problems and issues that would have to be resolved in order to deploy the multi-tiered defense being pursued under the Strategic Defense Initiative Program. Leaving those issues aside, let us remember one thing, that this is not exclusively a U.S. choice. What the President's speech has in fact done is to bring focus to a variety of Army, Air Force and other DoD programs that were looking at how to kill ballistic missiles and their reentry vehicles, and to say that we are not just going to focus the U.S. program as a hedge against Soviet break out or as a means of potentially defending vulnerable missile silos, but we are going to use this technology and the promise of advanced BMD technologies (particularly for boost-phase intercepts) to turn things around. The more optimistic and ultimate goal of the SDI is a shift away from reliance on offensive nuclear weapons towards defensive weapons which do not necessarily rely on nuclear kill mechanisms.

The Soviets have a program. We tend to focus on the U.S. and the Soviet Union, having in the past emphasized the predominance of offensive missiles and bombers in their policies. But that is not really the case. In the case of the Soviet Union, I think most are aware of a substantial air defense network that the Soviets maintain. And let us not forget that while adhering to the letter of the ABM Treaty, that hasn't prevented them from substantial upgrades of the Moscow system. The deployment of large lead-time items such as the very large phased array radars, one of which has been given press notariety recently, raises in the

minds of many that it's a violation of the treaty—the Abalakova LPAR. The Soviets give the appearance of a "creep-out," not a "backout" from the ABM Treaty.

What one has then is a scenario that we really need to give a lot of thought to. And it is the driving scenario. If the United States and its allies for political, economic and other reasons, decide not to build a defense in-depth, a boost-phase, mid-course and terminal defense system against the continuing, growing Soviet ballistic missile threat, (and now bomber and cruise missile threat), it faces what I would call high-tech breakout possibilities. The Soviets, as pointed out in earlier panels that Heritage has held, do enjoy many advantages and potential leads in the technology for directed energy weapons—lasers and particle beams. As Lowell Wood pointed out in one of the first Heritage sessions, we have learned a few things from the Soviets in the particle beam area.

We must also look at the Soviet space program, which is already fairly substantial and consists not only of a manned presence now, but also of a continually expanding satellite presence, and includes the deployment of a heavy Saturn V capacity lift vehicle and a space shuttle. These capabilities will give the Russians the opportunity to park in space in the latter part of this century the components for their own boost phase defense and could put the U.S. in a situation that we just cannot ignore. And it reflects back to the options—both defensive and offensive—and conventional and nuclear, that the United States and its allies have got to study and select from.

Specifically, we could find ourselves in the position in the next century where a crisis develops, a conflict breaks out between the United States and the Soviet Union either through proxies initially or by direct contact, and the Soviets simply inform us that the components of a boost-phase are now being launched. And if we take any steps to do anything about escalating, they will have a substantial capability to blunt our counter-response. That is an oversimplified scenario, but it illustrates the fact that the choice is not ours solely to make. The Soviets have a program. The only issue is when they decide politically and technologically that it's to their advantage to field it. And that may not be conveniently announced in peacetime. It may come up in a crisis where the technology base on both sides, but particularly the Soviet side, has expanded, giving them the option of launching a satellite or utilizing a covert deployment in a geostationery orbit from which the satellite can be directed to the proper orbit for intercepting its target.

I would just offer that scenario out and say it also argues for another

factor that we need to recognize, namely that offensive nuclear weapons are going to be around for a long time. The ultimate goal suggested by the President is to create, through a combination of effective defense and arms control, a world where nuclear weapons have been deemphasized. That's an ultimate goal, but in the meantime we're going to face a mix of not just the kind of scenario I portrayed, with effective dedicated Soviet ballistic missile defenses a real possibility, but also a situation in which air defense systems (particularly with new types of phased array radars and computer software and hardware) give the Soviets a substantial dual capability to intercept both air-breathing forces and ballistic missiles. The SA-5 problem has been around for years, but now we have a tactical defense system, the SA-12, and a strategic defense, the SA-10, that give the Soviets the option of intercepting U.S. ballistic reentry vehicles without even violating the ABM Treaty, or modifying it.

So I would say that the world of the future is going to be one where the distinctions between offense and defense become increasingly blurred even with retention of the ABM Treaty. A situation is likely to come about where systems that aren't covered by the treaty—and any tactical missile defense, by the way, is not covered by the treaty or banned by the treaty—play an increasing role in a strategic, intercontinental warfare context. I would say finally, that the issue of improving and modernizing NATO's and the U.S.'s conventional force posture is critical today and even more critical in that environment.

Mr. Weinrod: If there are any comments or questions from the floor, this would be the time.

Guest: I would like to ask every one of you to get the crystal ball out. Assuming that we do have European opposition to the SDI, assuming that you had the Administration and the subsequent administrations proceed with developing the SDI program and Congress funds it in some way, and let's say at sometime the United States is faced with a decision of whether to unilaterally go ahead with it or not, and the United States does make that decision, what do you think the likelihood is that Europeans will either respond to this by trying to cut their own deals with the Soviet Union and in effect become neutral, or do you think it's more likely perhaps that the Europeans might decide, well let's get onboard with the Americans because it looks like their program may work—this respect for power concept. Starting with Dr. Maitre's remarks, what will the SDI, unilaterally deployed, do to the European relationship with us?

Dr. Maitre: That is a barrel full. I think Western Europe will accept a system, once in place. It will oppose development vociferously. But I do not think it will cause a breakup of NATO. It is only a minor issue within a

greater picture. I think the project as such could have been acceptable right away if only it had been presented as part of a larger package, namely "Under me, the new American president, we will face the future more realistically. We expect different tasks now from Europeans (you did not have to couch it as spending). We would like to create, now, a partnership of real equal partners." That has not been done, but still can be done.

Clearly, NATO right now is in very bad shape, and by our stating time and again how well NATO has worked, we will not get very far because it is a truism. Yes, it has worked very well. However, the threat has changed completely. And you see the first dropout phenomenon in NATO: Greece, because of its row with Turkey. You realize that Turkey is a very reliable partner, a very tolerant partner, but cannot modernize its forces for two reasons: the Greek lobby here in Washington and Congress's decision to cut whatever is being promised to Turkey. The change has to come there. I point out Turkey because it is a pillar, much more than Greece ever was or could be.

Dr. Record: I think there is an issue whether or not NATO is going to be around by the mid-1990s, at least as an effective collective security organization, in which case the question of whether they are going to buy off on whatever we come up with may or may not be relevant. I would think that much of their response can be conditioned by what we do and say between now and then. I think, as I indicated earlier, much of the problem is the rather emphatic—and I think extravagant—picture that the President painted, perhaps inadvertently, in his March 23rd speech, about a perfect defense and the Astrodome clearly was not realistic. But that is the standard against which all of the opposition in Europe is being played against. They do not read the qualifying statements of the administration officials before congressional committees. They are using the March 23rd speech as more or less saying that "look you said you're going to have a perfect defense, but there is no such thing as a perfect defense and if only one missile gets through that's the end of it, so therefore you've got to be nuts or you can't be serious."

Guest: I just wanted to suggest that if what Manfred Hamm said is true about Minister Genscher in Washington last week, and knowing how the Europeans have been playing with the U.S. for years, the Europeans have really decided that the whole SDI is not a feasible initiative. Therefore, they can now tell the U.S. what it wants to hear, which is "Yes, we like what you're doing Mr. Reagan because it's so many years out in the future anyway." Why rock the boat now and cause feathers to furl?

Dr. Record: Let me make a comment on what was said earlier. One of

the great benefits historically for we Americans is that every time we have come up against the Germans in war, we benefitted from the fact that they did not know anything about seapower and had a very little navy. And the one time they did have a navy, they did not know what to do with it. So I am not quite so sure that I would want to see four German destroyers in the Indian Ocean; I might want to see four French or British destroyers.

Tom Krebs, High Frontier: Dr. Record, you talked about the President's speech of March 23rd. I just read that speech again about a week ago and I do not believe anywhere in there, unless I missed it in rereading it, it said anything about a perfect defense.

Dr. Record: He held up a vision of a world in which nuclear weapons would be impotent and obsolete.

Mr. Krebs: But I think the gentleman towards the end of the table mentioned what, I think, the President really meant, which was if we put up some kind of a defense that tends to make it say, 20 times as difficult to deliver your weapons on target, and put that together with arms control, you might end up with that kind of a world.

Dr. Record: If he meant that, it did not come out in the speech. He used some fairly unconditional language (I read that speech recently myself) in his remarks. And that language was not qualified to the extent that I think it might have been had he been more attuned to a European audience. I think he was trying to address a number of audiences, including our own interested bureaucracies. I think he wanted to have a speech that woke people up, that did hold out a very clear vision of a direction in which we wanted to move, a kind of speech that would electrify not only the bureaucracy but the Congress. Now the kinds of things you might want to say to get the bureaucracy moving and to get the Congress to pay attention are not necessarily synonymous with the right things to tell your European allies, particularly when you're talking about nuclear weapons. I think that was perhaps an inevitable problem that he faced in the speech.

Dr. Jastrow: I lay claim of having read that speech more often than anybody in this room. That may or may not be true, but I have read it a lot. And the language is very carefully drafted to avoid the mentioning of a particular technology and Reagan states, indeed, that we want our technicians to teach us how to make these weapons impotent and obsolete. He is very clear in his mind, I think, because he avoided coming out for area defenses, that any kind of defense will do that takes the Soviets two bucks to counter for every buck we spend for our defense initiative. As soon as you have that cost tradeoff, then you are on the way to the home

stretch. That is all that is necessary. And everything else you said, you are reading into his mind. It is not in the speech, not a word of it.

Dr. Record: Well I do not have a copy of the speech here. I read it before I came over here. Maybe we can get together and agree on what the certified copy would be. I am telling you what the impression was in Europe. He talked about a world in which weapons are going to be impotent and obsolete. That was the phrase he used.

Mr. Weinrod: That concludes our session. Thank you very much.

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The Heritage Lectures

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On March 23, 1983, Ronald Reagan urged that the U.S. begin investigating the possibilities for defending itself against nuclear attack. He then sketched what is now known as his Strategic Defense Initiative—or SDI. SDI marks an effort to move away from the strategic primacy played by offense since the development of atomic weapons. It signals a frontal assault on the concept, long accepted in the U.S., that deterrence can be assured only by leaving civilian populations totally vulnerable to nuclear destruction. As such, SDI is stimulating a fundamental questioning and rethinking of the nuclear doctrines of the 1950s and 1960s.

Not surprisingly, proposing a fundamental shift in the U.S. nuclear policy raises questions. Critics of SDI, often rushing to judgment, predictably have offered numerous objections. Yet even sympathetic observers have raised important issues. In response to the intense public interest and discussion, The Heritage Foundation hosted a series of discussions in May 1984 on the key issues involved in strategic defense. Participating was a distinguished array of scientists and policy makers.

While many differences of opinion were expressed by the panelists, there was general agreement that the development of a strategic defense system is technically possible and that short-term partial systems could be deployed within about five years. More comprehensive systems could be developed within a decade or so.

More important, there is sufficient possibility that SDI might help protect the U.S. and its allies, help pressure international strategic stability, and further the objectives of arms reduction, that the allocation of very substantial resources to the program is justified.

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