The Case for Ballistic Missile Defense

With his Strategic Defense Initiative, President Reagan has called on American scientists and engineers to devise a defense against nuclear ballistic missiles. In proposing that the United States switch from an offense-oriented to a defense-oriented strategic policy, the president has sparked a lively public debate about the merits of such a policy. As he noted in his March 1983 address, our current strategic policy is to deter aggression through the promise of retaliation. Deterrence has worked, and we have averted a nuclear exchange of any kind, for over forty years. But I believe we cannot afford to be complacent about changes that have occurred in the strategic balance over these years. As a member of the Defensive Technologies Study Team (Fletcher panel) that advised the president, I am persuaded that an increased effort to develop ballistic missile defenses is a wise course for the United States.

The Deterrence Equation

Deterrence has become a complex and subtle matter. The fine points of how to maintain deterrence in peacetime, in crisis, even during war, have been the subject of much discussion. But the basic concept of deterrence is relatively simple. The word itself comes from the Latin, meaning "from fear": deterrence is the state of not acting for fear of the consequences. Gen. Russell Dougherty, former head of the Strategic Air Command, has described it as the product of military capability and the will to use it. In the case of nuclear deterrence, we must pay far more attention to our opponent's capabilities—the
weapons and the means of using them—than to his will. We cannot gamble that he might be lacking in will, when the consequences of being wrong are so grave. Therefore, our current strategic posture is based substantially on the power of our offensive forces. It emphasizes the capabilities of the Soviets rather than their intent. We do not question that the Soviets have the will to act; instead, we make conservative estimates of the capabilities of Soviet strategic forces and assume they will use them in the way most destructive to our interests.

Our deterrence equation must also take into account our estimate of what the Soviets believe is unacceptable damage to their country. Because we have little confidence in our abilities to probe the psyches of Soviet leaders, our estimate is again very conservative. Our strategic force requirements are determined by working backward from the level of potential damage that we are confident will ensure deterrence. We believe we can deter the Soviets if their calculations always show that we are capable of inflicting unacceptable damage on them in retaliation, even after they have executed an all-out surprise attack against us.

Our ability to gauge what deters the Soviets has been sufficient to avert a nuclear exchange of any kind for over forty years. I assert that this is evidence that deterrence has worked. We seem to accept these decades of deterrence quite casually, even complacently, for two reasons. The first is manifest: human nature comes to accept the status quo as natural. The second is vital: until recently, the margin of our advantage over the Soviets in strategic forces has been wide. Even very large errors in our estimates of Soviet intent or Soviet capability would not have significantly changed the equation.

Today, however, the situation is less sanguine: the relation is one that some call “rough parity.” There is much debate over the significance of this shifted balance. Devotees of minimum deterrence argue that when both superpowers have thousands of nuclear weapons only a few hundred of which are capable of inflicting massive damage, an increase in numbers, no matter how asymmetrical the result, is irrelevant and therefore cannot jeopardize deterrence. Advocates of stronger strategic forces, on the other hand, warn that any imbalance encourages Soviet intransigence and adventurism, and a gross imbalance might invite a limited nuclear attack, which could easily escalate into a massive exchange.
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We have no way of knowing, before the fact, which of these two interpretations is correct. Yet we can reflect on the experiences we have had. The Cuban Missile Crisis of 1962 is often cited as an example of Soviet accommodation to our nuclear superiority; in contrast, Soviet stubbornness during the intermediate nuclear force (INF) negotiations of 1981–83 is seen as an example of Soviet implacability in our present world of “parity.” Such evidence is anecdotal and hence not altogether convincing. Perhaps we need to address the matter in a different way: what have we gained by letting our strategic superiority erode, and what have we risked? The benefits have presumably included reduced expenditures on strategic forces, reduced numbers of nuclear weapons, and an international reputation as a peace-seeking nation. The world has not been made a safer place, however, nor has nuclear war been made less likely by such erosion. The potential risks from an eroded strategic posture are far more onerous. They include new wars of national liberation, major incursions into, for example, Europe, or actual nuclear exchanges and loss of sovereignty and freedom.

We have tried various stratagems since the mid-1960s to sustain our strategic position. At first, we sought to preserve superiority; this was followed by “balance”; then came, in rapid succession, “essential equivalence” and “countervailing forces”—all euphemisms for a declining strategic margin. During much of the 1960s and 1970s, we cut the budget for nuclear forces almost every year. We have made some efforts to bolster our strategic forces, though with mixed results. The B-1 bomber, at first cancelled, has been revived, though in drastically reduced numbers. The MX has been approved, though again in reduced numbers. Minuteman’s accuracy and hardening have been improved, cruise missiles are being deployed on bombers, and Trident submarines are operational.

Nevertheless, our efforts pale beside those of the Soviets, whose massive buildups have now spanned over twenty years and have brought them parity in numbers of strategic warheads and superiority in total explosive power. Moreover, the Soviets have devoted themselves to the full range of strategic forces, including defenses. They have maintained and are now improving their ABM system around Moscow; their air defense network is extensive; Soviet civil defense preparations are vastly greater than our own; and they are pressing ahead with advanced ballistic missile defense technologies.
The United States has also tried detente and arms control as methods of stabilizing the strategic balance. The SALT negotiations may have diverted, but they did not halt, the Soviet buildup of forces; our efforts at limiting strategic arms by negotiations have proved disappointing. As things now stand, we are frustrated in our dealings with the Soviets, we have no consensus at home about what our policy should be, and our media’s recent focus on the horrors of nuclear war has unsettled us. What we are in need of is a new approach, one that might allow us to escape our current dilemmas while still preserving viable strategic forces. The addition of strategic defenses to our national policy serves just this function.

To discuss the promise of ballistic missile defense, we must first consider what the Strategic Defense Initiative refers to as “intermediate capabilities.” To begin by examining those types of defense that raise relatively clear issues—defense of valuable hard targets, local area defense, and light area defense—and move gradually to consider full, “perfect” defense of the nation, the most contentious issue. (It will be useful, throughout the discussion, to bear in mind that these defenses could also be useful for our allies and in some cases would demand deployment by them.) We will trace how these defenses would carry us from the offense-oriented deterrence we now know to a potentially more powerful, but certainly less familiar, defense-oriented strategy.

HARD-POINT DEFENSE

One dimension of the Soviet strategic buildup that must concern us is the increase in their number of highly accurate, high-yield ICBM warheads appropriate for attacking U.S. deterrence forces and other hardened military targets. Carrying out such an attack would by no means be an easy task, as the Scowcroft Commission has pointed out. Yet when the Soviets devote so much effort and resources to acquiring a military capability, we must take seriously the potential threat that it poses. While hard-point defenses of our retaliatory forces were not explicitly addressed by the Fletcher panel (they had, after all, been studied almost continuously since the early 1960s), the possibility was examined by the Hoffman panel, which came out in support of such a policy.
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Hard-point defenses would complement deterrence in a straightforward manner. Our present retaliatory forces achieve survivability in many ways: bombers are launched on warning (mobility); submarines patrol under the oceans (mobility and concealment); and land-based ICBMs are deployed in silos (hardening). As the accuracy of Soviet ICBMs has improved, however, the ability of our hardened silos to withstand attack has become a matter of acute concern. Of the several ways to preserve or reestablish the survivability of our ICBMs, defense shows considerable promise. Hard-point defenses are an alternative to deploying more offensive forces in order to maintain the strategic balance. Instead of installing an offensive missile in yet another silo, a defensive interceptor could be deployed to destroy an attacking warhead before it reaches the silo. Conceptually, either of these methods increases the survivability of our retaliatory forces. The choice a country makes would depend on the cost-effectiveness of offensive versus defensive systems and their political and diplomatic ramifications. Three factors so far seem to have prevented the United States from deploying hard-point defenses: the existence of the ABM treaty, uncertainties about the importance of ICBM “vulnerability,” and disagreements about what should be done to rectify it.

It is difficult for most people to grasp that the time to act on the survivability of our land-based ICBMs is while their effectiveness is still intact. This point deserves emphasis. If we wait until the threat to our retaliatory forces is unambiguously clear, we will have plunged ourselves into a situation of great strategic instability. Since it takes a decade or more to design, develop, and deploy any major weapons innovation, the time to begin improving our forces is long before the danger actually confronts us.

In our past calculations of what we needed for effective deterrence, we have always presumed that the Soviets would make a massive attack against our Minuteman ICBMs—as well as many other targets—and that only a fraction of them would survive. The role of active defenses would be to assure survival of at least this fraction in the face of an increasing Soviet threat. One tactic available to us is preferential defense. In preferential defense, the defender marshals his resources (in this case BMD interceptors) to defend only a limited number of points he has secretly selected. If the defender concentrates his defense effort to protect a few targets, the attacker must also increase the size of his attack on those targets if he wishes to destroy...
them. But if the attacker does not know in advance which targets will be defended, he must increase the magnitude of his attack on all targets. Just a few BMD interceptors on the part of the defense, therefore, forces the offense to multiply his forces manyfold—or develop a wholly new tactic.\(^3\) To be effective, a preferential defense system must be able both to defend itself and to give the appearance of being able to defend an area much wider than the few targets actually selected.

Some systems being considered for defense of future land-based ICBM systems would have even greater leverage. For example, a system could combine defense with deceptive missile basing, which would move a relatively small number of ICBMs among a very large number of shelters. Because the location of each missile would be kept secret, the enemy would be compelled to attack all the shelters to be sure of destroying the missiles hidden within some of them. One defensive interceptor accompanying each ICBM would approximately double the number of warheads required to destroy all the missiles. If there were two hundred ICBMs and four thousand shelters, for instance, the enemy might consider an attack with four thousand warheads to be adequate. But if each ICBM were protected by an interceptor, the enemy would have to target two warheads on each shelter—or eight thousand warheads in all—in order to be successful.\(^4\)

The small, hard-mobile ICBM—or Midgetman—system that is recommended by the president’s Commission on Strategic Forces has some inherent suitability for such high-leverage defense. In this system, the missiles would be moved randomly on mobile launchers over government land in the Southwest. Since the Soviets would not know where each launcher was at any moment, but would presumably know the bounds of the overall deployment area, they would have to barrage the entire area with warheads to destroy the missiles. A mobile launcher is inherently a softer target than a silo and may potentially be damaged even by warheads that explode a considerable distance away, thus making it harder for a limited defense to protect the missile. Still, if an interceptor (and its associated equipment) accompanied each missile and shot only at those warheads that would destroy the missile, the warhead requirements for the Soviets would be doubled.
There is little doubt of the cost-effectiveness of such defenses. The Soviets would be hard-pressed to add, say, four thousand warheads to their strategic arsenal for every two hundred interceptors and associated equipment we deploy. The marginal cost to the attacker of adding another warhead to his missile force and modifying his post-boost vehicles seems to be about $3 million apiece—or $12 billion for four thousand additional warheads. A modern BMD interceptor would cost somewhat less than $3 million, although the two hundred small radars and the complex system integration equipment would be expensive, perhaps $10 million per missile—or $2 to $3 billion for the whole system. These ratios favor the defense by about five to one. Adding a second round of interceptors would increase the leverage even more.

Hard-site defenses also have very favorable attributes from the perspective of strategic arms control. They add to deterrence because they protect retaliatory forces while leaving urban-industrial targets unprotected, and they add to stability because they do not threaten either the cities or the forces of the other side. They have the additional advantage of providing the command authority with more time to make crucial decisions. Of course, the ABM treaty, as amended, allows each side to defend either an area containing missile silos, or its national capital. The forces permitted by the treaty (only one hundred interceptors) are insufficient for creating an effective overall defense, however. Thus, even a defense that is almost wholly in accord with the principles of strategic arms control would require renegotiation of the ABM treaty for deployment. Verification of limitations on such defenses would be feasible in several ways, although on-site inspection would probably be required.

It is inappropriate to leave off discussion of these high-leverage defense systems without noting their technical difficulties. Unless the ICBM launchers or shelters can be made as hard as their advocates claim, and the exact location of the missiles at any moment kept secret, preferential defense will lose its effectiveness. And unless the defense radars (or other sensors) are as hardened as the missiles they are protecting, or are rapidly replaceable if damaged, an attacker could degrade or nullify the defense by attacking its weakest part. The offense might try other clever tactics: shoot-look-shoot, nuclear blackout of the defense radars, or maneuvering warheads. Shoot-look-shoot entails risks, because while the attacker is looking, we
could be retaliating with the ICBMs that survived the first strike. Nuclear blackout is not so effective against a preferential defense that is able to intercept warheads in the last seconds of flight. And maneuvering vehicles lose velocity and accuracy very rapidly when making hard turns at low altitudes. All these countermeasures deserve further investigation as part of a BMD program.

In sum, there are important factors favoring ballistic missile defense of our land-based ICBMs. Furthermore, we foresee no apparent detrimental effects if the Soviets should also deploy such defenses, within reasonable constraints. The technical and political problems do not seem insurmountable; it is rather an inchoate public suspicion of defense, and apprehensions about tampering with the ABM treaty, that are the obstacles to be overcome.

LOCAL AREA DEFENSES

Another "intermediate" defense option would be defense of valuable, but not necessarily hardened, targets or clumps of targets such as air bases, command-and-control centers, and seaports. This was addressed explicitly by the Hoffman study and implicitly by the Fletcher panel and so is a legitimate option within the SDI.

The merits of defense for such local area targets are not so easy to state as for land-based ICBM forces. Many of these targets are in or near cities and most are soft. The technical problems of defense are greater because incoming warheads have to be intercepted much farther away. And where such targets are few in number and the survival of each quite important, preferential defense may not be feasible—any or all of them might be destroyed by a concentrated attack. Given these target characteristics, it would usually be more cost effective as a first step to try more conventional means of protection: proliferation, mobility, secrecy, hardening, or some combination of these.

Over the years, studies have been made of ballistic missile defense for some valuable targets such as strategic bomber bases. Currently, we ensure that a significant fraction of our bombers will survive attack by putting them on twenty-four-hour alert, ready to take off on warning of attack. During crises, the fraction on alert can be raised and the bombers dispersed to other bases. Defending bomber bases arguably offers two advantages over these procedures: it would
also protect that portion of the bomber force not on alert, and it would increase the survivability of airfields after a nuclear exchange. Yet defending the bases would probably be the most expensive way of guaranteeing the survival of bombers. A full defense of airfields would have to intercept large numbers of SLBMs, ICBMs, and cruise missiles—all of which the Soviets could place on target almost at their leisure, because once our alert forces have departed, the remaining planes are slow to respond. Moreover, defense of bomber bases presumes nuclear war-fighting and protracted nuclear war. It thus raises the question whether money spent on defending air bases might be better spent on forces that would increase deterrence and prevent nuclear exchanges in the first place.

As for command-and-control centers, increasing their numbers seems a more efficient way to ensure continued operations. Suggestions that we defend them seem to stem more from a sense that it would be easier to obtain funding for defense than for adequate command-and-control facilities themselves. But if we think of the national command authority (NCA) as people, rather than facilities, the issue is more easily resolved. The whereabouts of the president and secretary of defense at the start of an attack can never be anticipated, so their safety can never be fully guaranteed. Short of an almost leak-proof whole-country defense, the most effective tactic for preserving command authorities is to equip and train the NCA hierarchy and staff.

For similar reasons, defense of seaports probably does not make sense. The number of major seaports is small, they are soft targets, and they tend to be far apart. The Soviets could simply overwhelm the defenses if they choose to make a large enough attack. More important, however, seaports are more of a military convenience than a necessity. The Soviets could not stop the flow of goods to our allies by attacking seaports. There are far too many ways to transport material of all kinds: over the beaches; by air; through improvised ports; or through the small ports, marinas, and piers that dot our 23,000 miles of coastline.

Defending various valuable but soft targets with local area defenses, then, does not seem promising.
So-called “light area defenses” would be a step beyond local area defenses. They would protect the country as a whole from a light attack, that is, a level of nuclear attack substantially less than what would be expected in a major nuclear exchange. The United States started to deploy a light area defense, the Sentinel system, in the 1960s. In 1968, Sentinel’s name was changed to Safeguard, its mission was changed to protecting Minuteman ICBMs, and its light area defense role was markedly reduced. After the ABM treaty was signed, the few sites that had been built were dismantled. Studies of light area defenses continued, however, on the assumption that the United States would eventually need them. One rationale was that we needed to raise the threshold of any small nuclear attacks made on us by the Soviets. It cannot be denied that as the commitment of weapons required by an attacker increases, and the intensity of probable responses therefore becomes larger, the likelihood of his engaging in impulsive acts declines dramatically. It was further argued that the whole country needs protection—with increasing urgency as nuclear weapons proliferate—from attacks by nations with small nuclear arsenals, from accidental or unauthorized attacks by any source, and from attacks by terrorist groups. Supporters of light area defense reason that although such attacks may be unlikely, there is a finite probability that one or more will eventually occur.

Until recently, light area defenses had to rely on strings of radars along the coasts, as ground-based radars could not survey beyond the horizon. Short-range surveillance begat numerous (and expensive) short-range missile sites. Several developments since the early 1970s have altered that situation. Air- and space-based surveillance of huge areas is now feasible. Small, accurate, hypervelocity BMD warheads are practical, making the interceptors that carry them much faster given the same overall weight. The huge signal and data processing requirements of a central site can probably be accommodated now because of vast improvements in computers. Space-based directed-energy weapons could provide light area protection even if they could not achieve whole-country ballistic missile defense.

Light area defenses would also have growth potential as the threat became more sophisticated or the potential number of attacking warheads increased; more interceptors could simply be added. The
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sensors and computers are the key components for upgrading; they need higher capacities and improved software to solve the complex problem of finding warheads among a variety of penetration aids. As this upgrading is achieved, the light area defense could gradually become the terminal portion of a whole-country defense.

An upgraded light area defense system deployed overseas might also provide a dense defense against attacks on NATO by Soviet theater nuclear forces. Our European friends might be comforted by the realization that the United States would no longer be constrained in its diplomatic support by the concern that the Soviets might engage in nuclear adventurism against Europe as a response. If the Soviets also deployed a defense, it might neutralize the retaliatory forces of both Great Britain and France, but both could field sophisticated penetration aids that would add to the Soviet Union’s uncertainties about its defense effectiveness. Of course, with the nuclear threshold raised on both sides by the presence of defenses, NATO readiness at the conventional level would become even more important than it is now.5

While effective light area defenses would require modification of the ABM treaty if we decided to deploy them, they seem to violate none of the precepts of strategic arms-control theory. They would simply force the Soviets to increase the scale and risk of a successful nuclear attack, thereby deterring an attack and increasing stability. Small numbers of interceptors would not significantly undermine assured destruction. They would not increase the level of nuclear weapons in the world. Even if they drove the Soviets to counter with an increase in offensive weapons, that increase would presumably be nullified by the number of weapons that would be intercepted and rendered useless. The world should be a somewhat safer place with light area defenses, particularly since they could evolve to meet an increasing threat.

In the cases of hard-point and local area defenses, it was noted that alternatives to defense could be used to achieve the same objectives, sometimes at lower costs. There are no alternatives, though, to light area defense, so we must think quite differently about the costs involved. Cost comparisons must be tied to the damage that expenditures on light area defense could prevent, including the loss of human life. Tens of thousands of human deaths and billions of dollars of
property damage would be a tragic price to pay when they could be avoided by deploying an efficient light area defense.

One point should not be forgotten, however: none of these hard-point, local area, or light area defenses against ballistic missiles can provide effective protection unless augmented by air defenses against bombers and cruise missiles. Although BMD systems have substantial capability against airborne threats, they are insufficient. Air defense would also be required for whole-country BMD systems.

WHOLE-COUNTRY DEFENSE

Whole-country defense is the subject of greatest contention in discussions of ballistic missile defense. President Reagan's March 1983 speech set the protection of all Americans from the threat of all nuclear weapons as the ultimate goal. The Fletcher panel also focused on defense-in-depth of the whole nation as the heart of its study, acknowledging lesser deployments as potentially useful components of the whole.

When ICBMs first appeared in 1957, whole-country defense was an immediate concern. But in the following decade, the outlook for a successful city defense became bleaker. When a 1968 Defense Department study showed that even a very expensive city defense system would not reduce the casualties sustained in a heavy attack, the major funding for city defense R&D was cut back and substantial funds were diverted to hard-point defense.

What were the technical deficiencies that spelled the demise of city defense? Boost-phase defenses had been examined in the early 1960s and found impractical—surveillance requirements could not be met with existing technology, and interceptor velocities (even from a space platform) were too slow to allow a sensible system design. The effectiveness of penetration aids in space, where the drag of the atmosphere is not a factor, made an effective mid-course defense unlikely. Although atmospheric drag would separate warheads from decoys during the terminal phase, the altitudes at which this occurred were too low for city defense. And the capacities of computers required to handle an intense attack were far beyond the state of the art.

But if whole-country defense was laid to rest in the late 1960s, why resurrect it now? Technological advancements have occurred that
promise order-of-magnitude improvements in every area previously deficient. Multi-spectral infrared sensor technology allows surveillance of the whole earth from deep in space; computer processing capacity has increased a thousandfold. The most exciting new technologies are speed-of-light weapons, which could substitute for slower interceptors and make space-based boost-phase intercept feasible. Regardless of current criticisms, such weapons might prove cost-effective. After all, the chemical energy equivalent of ten kilograms of fuel would be sufficient to kill a hardened Soviet missile weighing hundreds of thousands of kilograms. Furthermore, protection and survivability of space platforms can in principle be enhanced, so there is some prospect that they can win a long-term offense-defense competition.

There are still a good number of problems to be addressed. Intercepts occurring earlier in the ICBM's trajectory (as early as the boost-phase, in fact) must cope with a panoply of penetration aids, and it is important to determine whether new technologies will meet that requirement. It is also important to assess whether the systems that emerge will be lethal enough to perform the mission, and robust enough to survive a massive effort by the Soviets to nullify or counter them.

POSSIBLE SOVIET ACTIONS AND REACTIONS

The Soviets will doubtless regard the various tiers of a BMD system differently, reacting more strongly to space-based weapons systems than to the more familiar terminal or mid-course systems. How, then, might the Soviets respond to our deployment of a broad-coverage, terminal/mid-course ballistic missile defense that contained airborne and space-based sensors, but no space-based weapons?

First, the Soviets would have to assess the overall current and potential effectiveness of our defense and build up their offensive forces accordingly. In order to attack those targets they believe are critical, they would have to take into account that our defense can range over a large area, and they would therefore have to use large multiples of the actual number of targets. In a democracy, preferential defense of regions is obviously inappropriate. Yet if an attack occurs, our defenses, although deployed for broad protection, must surely first be employed to protect those sites critical to our survival
as a nation. The worst aspect for the Soviets will be uncertainty; not knowing which targets we are determined to save, they cannot be confident that their attack will succeed. To counter the obstacles posed to a successful preemptive strike by the survivability of our retaliatory forces and the existence of our defenses, the Soviets will be driven to building defenses of their own. To be uncertain of their capabilities against us, while certain that we could annihilate them should be intolerable for the Soviets.

The result would be a world in which both superpowers have deployed offensive and defensive strategic systems. Would such a situation merely reestablish, but at a greater cost to both sides, the status quo? The answer is no, because of two new, key factors. Defenses will have raised the threshold for effective attacks so high that only major nuclear strikes would have an effect, and the uncertainty of outcomes would be great. Thus, the likelihood of a nuclear exchange would be substantially reduced, the spectrum of conditions under which it might occur greatly narrowed, and both sides would have means of protection against accidental launches and third party attacks.

The Soviets may react more vigorously to a U.S. defense system if it is deployed in space. Since space-based weapons have to be deployed gradually, on orbital paths the Soviets can readily predict, we should expect that the Soviets, fully aware of the threat such weapons pose, would make every effort to destroy them. The Soviets may calculate that speed-of-light weapons in space would grant global hegemony to the first country that deploys them successfully. They may reason that once either side gets a space-based system in place, its survivability may depend on preventing the other side from undertaking unauthorized launches into space. They may also reason that even if both sides deployed space defenses, the co-presence in space of Soviet and U.S. directed energy weapons of approximately equal capability might be extremely destabilizing, as an attack by either side on the other’s defense could grant a country global hegemony in a matter of minutes. Motivated by such fears, the Soviets may consider attacking our defense satellites and launch pads.

Accommodating such extreme possibilities would require heroic measures. Our launch sites might be hardened against all but nuclear attacks, they might be defended, or their security might be part of a negotiated arrangement with the Soviets covering defenses. As for
security in orbit, defensive satellites (DSATs) could be launched into orbit with each directed energy battle station.

Because of its obvious expense and complexity, a space-based defense will probably not be deployed unless it is a low-leakage system. How would such BMD further affect the strategic balance set by terminal/mid-course defenses? First, it would remove us from the era of deterrence by mutual assured destruction. An all-out Soviet attack may still wreak havoc on our country, but it could not annihilate us. Second, it would place increased demands on the Soviet defense system, which would be driven to achieve balance with our own. Our inability to destroy each other would establish a new deterrence, one based not on the terror of offensive forces, but on respect for defensive systems. This situation has been characterized by some as a move from assured vulnerability to assured survivability. This is not exactly the case, since no imaginable set of defenses can prevent a determined and resourceful enemy from detonating nuclear weapons in our country. But the attacker’s certainty that his objectives (other than naked terrorism) cannot be achieved, provides a quantum change in strategic perspective.

How does whole-country defense fit in with strategic arms-control theory? It would certainly be consistent with important goals of arms control. It would improve stability by raising the nuclear threshold and introducing a greater measure of uncertainty into an attacker’s plan. There are those who disagree with this: they argue that defense is destabilizing because deployment of defenses may alarm the other side by signaling a changing strategic balance, thereby encouraging a preemptive nuclear attack; and that defenses, known to be imperfect, will only be used by the attacker—against his opponent’s ragged response to a massive first strike. The first of these objections would be sound only if there existed a huge imbalance in superpower forces—which is not at all the case today. The second objection would be valid only if it were the case that reducing the number of attacking warheads would allow poor defenses to become nearly perfect. But a defense of acknowledged mediocrity can be penetrated in a variety of ways by forces whose survival from an all-out first strike can be assured. A ragged retaliatory strike, therefore, is inexcusable militarily; neither side should allow the balance or the quality of offensive forces to become so degraded.
Arms control would still have an important role in a world of whole-country defenses. Even though the defense systems may themselves be non-nuclear, the total number of nuclear weapons in the world would be increased if the Soviets responded to our defense deployments (or we respond to theirs) by deploying a larger number of offensive forces. Moreover, in the absence of mutual restraints, either country may feel compelled to continue augmenting its offensive forces without limit, even if cost-exchange ratios favor defenses. That a truly massive effort in offensive deployment could overcome any defense is a certainty. Thus, even in a defense-oriented world, agreements on acceptable levels of offensive nuclear arms would be imperative.

Whole-country BMD does violate one of the precepts of current strategic arms-control theory: it renders retaliatory forces less effective. But a defense orientation would rely on a different form of deterrence: the would-be aggressor would be dissuaded not by the fear of annihilation so much as by the recognition of futility. Particularly if the cost-exchange ratios favor defense, the motivation would be to negotiate. In the end, the level of nuclear weapons required by the superpowers should become just sufficient so as to maintain an adequate margin over any combination of forces of lesser nuclear powers.

NEAR-TERM COST ESTIMATES

The last question to ask about the move toward a BMD-oriented world might be whether the amount of money earmarked for the president’s Strategic Defense Initiative is too much. The plan was to spend about $26 billion over the first five years (1984–89), then to decide in the early 1990s which technologies are suitable for incorporation into systems. This would give future administrations the option to proceed with engineering development of those technologies and to deploy them—if feasible—in the first decade of the twenty-first century. Some technologies, and therefore some systems, can be ready for engineering development (building of prototypes) before 1993 and deployment before 2000. But the $26 billion SDI estimate includes no full-scale engineering development for these systems, and does not provide funds beyond 1989.
Estimated expenditures for the SDI through the 1980s average around $5 billion per year. Historically, the Pentagon has allotted about 10 percent of its budget to research and development of all kinds. The current amount is about $30 billion per year. By 1989, the SDI will require about 17 percent of the Pentagon’s R&D budget—not insignificant, but certainly affordable. Government officials have estimated that $15 to $20 billion of the projected $26 billion would have been spent anyway in research and development on projects that are technologically similar to potential defense systems, on work to prevent technological surprise, or on efforts to keep penetration-aims technology at the state of the art.7 The whole SDI budget will amount to far less than what Americans will spend on cigarettes or cosmetics during the same period.

The costs of possible future systems development can only be guessed at. Major systems such as submarine-launched ballistic missiles and bombers cost several billion of today’s dollars to develop. A complete BMD system might consist of as many as ten separate systems, costing perhaps $40 billion for full engineering development. Estimates of the full-scale engineering development costs, like the ultimate systems costs, should be given little attention and still less credence now, especially since they seem to be within the broad bounds of affordability.

In considering these costs, we need to take a broader view than is usual in the formulation of public policy. Both the promise and the problems of the new defense technologies being investigated in the SDI will require a long time to clarify. This urges us to seek a new perspective on our long-term strategic posture. Because we elect our politicians to terms of two, four, and six years, and make five-year guidance plans for the Defense Department, we find it hard to think in terms of the twenty-, fifty-, or one hundred-year future. But the challenge we face is a massive one: averting nuclear holocaust for centuries. Our ambitions to create an effective whole-country defense using futuristic weapons should be viewed in that light. And the costs of developing such a defense should be considered in those terms as well.

THE SDI AND ARMS CONTROL

Perhaps the most delicate issue raised by the SDI concerns the coordination of defense research with the development of a rational
strategy for strategic arms reductions. As I noted above, arms control will remain important even in a defense-oriented world. Therefore, we must not blunder into situations that would be disastrous to our prospects for strategic arms reductions. Neither do we wish to cling to tenets of arms control that are flawed or outdated. Each defense discussed above would require renegotiation of the ABM treaty before its deployment, and testing many of the components in the ABM mode might also require treaty modifications. Our existing treaties are the product of honest and diligent efforts, and reflect the views, ideals, and technologies of the time. Nevertheless, they should not be viewed as sacrosanct. These treaties were all originally devised for security purposes, and if those purposes can be shown to be better served in new ways, the treaties should be adapted to changing circumstances.

As I have argued above, there are a variety of defense systems beneficial to American security that appear consistent with arms-control goals implicitly endorsed by the Soviets in their signing of past agreements. In many instances, the Soviets came to accept arms-control measures they initially condemned—the ABM treaty is an excellent example of this change in Soviet posture. We should not be surprised if the Soviets react to the SDI in much the same way.

SUMMARY

I have argued that many new technologies show promise of making a spectrum of BMD systems practical; that a strategic posture based on defense can contribute to deterrence, increase stability, and reduce—and perhaps eventually eliminate—the threat of nuclear extermination; and that we ought to support a vigorous development of BMD technologies to discover their true potential.

In saying these new technologies show promise, I am not assuming, or offering a guarantee of, success. The Fletcher panel concluded only that the technologies were sufficiently understood for us to sketch out broad systems concepts for a multilayered defense. The crucial technological issues will take years of research, engineering, and analysis to resolve; they certainly cannot be resolved now by polemics. Yet in our open society, any large and technically ambitious initiative like the SDI is subject to immediate and widespread attention from the media and the citizenry. Temptations are irresistible for
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intellectuals, who deal in words rather than hardware, to attack broad system concepts as if they were actual system designs, and to predict confidently the outcome of decades of research. Any broad-based technology program such as the Strategic Defense Initiative must be guided by a set of conceptual systems that is admittedly incomplete and imperfect. Unless the public is discriminating, it may find itself unable to distinguish issues from quibbles in the debates over the direction of the SDI. Thus, the seeds of good ideas may be lost before any facts can be determined. For now, the question should not be whether conceptual systems will work, but whether the technology is worth pursuing to find out what can be achieved: let us stick to that question.

ENDNOTES

2Texts of the Fletcher and Hoffman reports, as well as the Defense Secretary’s summary report, can be found in “Strategic Defense and Anti-Satellite Weapons,” Senate Committee on Foreign Relations, 98th Cong., 2nd sess., April 25, 1984, pp. 94–175.
3One such tactic is shoot-look-shoot, in which the attacker fires a first wave of missiles, watches to see which sites are defended successfully, and then fires a second wave concentrated on those targets. In the time required for shoot-look-shoot, however, the defender may retaliate with his surviving forces.
4See Harold Brown, Thinking About National Security: Defense and Foreign Policy in a Dangerous World (Boulder, Colo.: Westview Press, 1983), p. 71. Brown describes the concept of preferential defense for ICBMs, but notes that unless the ICBMs are deployed in deceptive basing, adding ballistic missile defenses will not have a significant effect on ICBM vulnerability.
5Colin S. Gray, Nuclear Strategy and Strategic Planning (Philadelphia: Foreign Policy Research Institute, 1984), pp. 86–92, provides a point-by-point discussion of the effects that BMD might have on the NATO alliance.
6In the late 1960s, when the United States first considered deploying a ballistic missile defense, Secretary of Defense Robert McNamara argued, for instance, that “all we would accomplish by deploying ABM systems against one another would be to increase greatly our respective defense expenditures without any gain in real security for either side.” Department of Defense Annual Report, FY 1968 (Washington, D.C.: Government Printing Office, 1967), p. 40.