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Space Defense— The Impossible Dream?

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FRIDAY JULY 18

THREE YEARS AGO, President Reagan revealed in his famous TV speech his dream of a defense against strategic ballistic missiles which would "render nuclear weapons impotent and obsolete." The problem and solution were both clear in his mind: Although deterrence of nuclear war by threat of retaliation had worked and would continue to work, the U.S. and its allies deserved better than to base their security on the threat of destruction of another society. It was this dream the president shared with the American people — a defense so perfect that not only would Soviet nuclear weapons be rendered impotent, but ours would be rendered unnecessary.



Dr. Richard Garwin

Dream to Concept

Soon after the president's speech, 50 scientists and engineers under the leadership of Dr. James C. Fletcher (the Defensive Technologies Study Team — DTST, or the Fletcher Committee) began a 4-month study to learn whether it was feasible to achieve the president's dream. At the same time, a group of six political scientists led by Dr. Fred S. Hoffman, constituting the Future Strategic Security Study began a parallel investigation.

By October 1983, the Fletcher Committee had completed its 7-volume report, judging that eventually a "robust effective" defensive system could be built, but conditioning this judgment on the limitation of Soviet offensive forces by arms control or other means. The Hoffman study, in contrast, was skeptical that highly effective defense could be obtained, but was enthusiastic about the benefits of a nearer-term, perhaps 50 percent effective defense against strategic ballistic missiles.

Possible Goals

Three possible goals of defense systems resulting from the SDI program are:

- A defense so good that U.S. and allied security would not depend on a decision of the Soviet Union to avoid nuclear war, and which would allow us to give up our nuclear weapons for retaliation.
- A defense which would deny the Soviet Union confidence in achieving military goals by nuclear attack so they would be deterred from such attack, not by retaliation, but because the benefits would not be worth the expenditure.
- A defense which would improve the survival of the 1000 silos in which U.S. Minuteman missiles are deployed, and thus strengthen deterrence by threat of retaliation.

The first goal is the president's dream, but has in fact been rejected as infeasible

by those working on the program. Right after the Star Wars speech of 1983, White House staff characterized those who advocated continued deterrence of nuclear war by threat of retaliation as "bloodthirsty" — lacking in imagination which would allow them to conceive of a defense which abandoned deterrence by threat of retaliation.

The perfect defense which would allow us to abandon our own nuclear weapons is not being sought. It cannot be achieved, in part because we do not know how to make systems perfect which, when challenged with 10,000 or 30,000 nuclear warheads — and a million decoys or more — could destroy all of them except one or a very few. More important is that the Soviet Union does not want to be disarmed by having such a perfect defense in the hands of the West.

If we are interested
in reducing the So-
viet threat, we ought
to do it by example
and negotiation.

Possible Countermeasures

Options open to the Soviets to nullify this system are to underfly it with cruise missiles, to overwhelm it with numbers, or to outfox it by blinding the necessary sensors — by rotating the missile in boost phase to spread out the heat from space-based lasers, or by providing the real warhead in mid-course with decoys attached by cords, so that when a small homing kill vehicle collides with the warhead after several minutes of travel, it may collide instead with a hollow plastic balloon tethered at a distance of 20 meters from the re-entry vehicle.

All these countermeasures use pre-SDI technology, as does the general-purpose counter of a fast-burn booster, which can achieve full ICBM speed in some 50 seconds.

Additional countermeasures available to the offense are space mines — small explosive-carrying satellites accompanying a defensive satellite always within lethal range and ready to explode at receipt of a command or when tampered with.

In general, defensive systems deployed in space are regarded as very vulnerable to countermeasures by the other side.

As for the third possible goal, it is entirely feasible to contribute to the survivability of the strategic retaliatory force and thus to strengthen deterrence rather than to replace deterrence.

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Garwin

Is SDI Needed?

If the goal of perfect defense to allow elimination of Western nuclear weapons is regarded as incredible and is in fact not being sought; and if the goal of defending missile silos can be achieved sooner and more cheaply without the SDI, what goal is left which warrants the treasure being expended in SDI research? The only one remaining of our three is "to deny the Soviet Union confidence in the military goals of nuclear attack on the U.S. or its allies." It is not easy to define a nuclear attack which can be counted as gaining military goals in the absence of an SDI defense, and which can be denied by the presence of a modest defense.

Indeed, one can assign tasks like destroying the 500 odd-numbered Minuteman silos, which could probably not be done now and could certainly not be done in the presence of any significant defense. But these are not militarily significant tasks, and the denial of confidence in achieving the task is not militarily significant either. In fact, none of the three goals of strategic defense is either achievable or significant.

Arguments In Favor

Two additional reasons are often presented by "realists" as the reasons why they support SDI. These are the rogue-nation ICBM and the Soviet accidental launch.

The argument goes that Libya acquires an ICBM and mounts a stolen nuclear warhead on it equipped with a re-entry vehicle. It then holds New York hostage, threatening to launch its ICBM, and destroys the city. But without any SDI capability, existing U.S. infrared warning satellites could be teamed with a few of the Minuteman-II ICBMs to provide a capability for meeting the rogue-nation warhead in space with a massive nuclear explosion which would certainly render it "impotent and obsolete."

The prospect of an accidental launch of Soviet ICBMs has been the subject of letters to the editor and short articles in the United States, supporting the SDI program. We are supposed to do research on the SDI for 10 years and take another 5, 10, or 20 years for deployment of a system, which would then reduce the likelihood that accidentally launched Soviet ICBMs would destroy their targets in the United States.

However, if this is regarded as a problem sufficiently serious to warrant such expenditures, it could — and should — be solved long before SDI could contribute, and at much lower cost.

As evidenced by the radio-commanded destruction of the two solid-rocket boosters on the *Challenger* space shuttle, every missile tested from a U.S. range, and presum-

ably every Soviet missile tested from a Soviet range, has a secure "command-destroy" capability. Broadcasting the highly secure "secret word" to the missile in flight destroys it. Those who really fear accidental launch of Soviet strategic missiles could essentially eliminate that threat within a year. Surely the Soviet Union does not want to destroy the United States by accidental launch.

In the case of both rogue-nation ICBM threat and Soviet accidental launch, the conclusion is the same — these problems can be solved sooner and more cheaply independent of the SDI.

President Reagan terms his hope for a defense which would allow the elimination of strategic offensive weapons his "dream." The problem is that this dream impedes otherwise achievable reductions in strategic offensive weapons — reductions valuable in themselves, but more valuable because their dynamics will allow greater concentration in the West on matters of true concern to Western security, efficiency, and civilization.

The Alternative

The demand for parity can be satisfied just as well at a vastly reduced level of armament, resulting from strict attention to the ABM Treaty of 1972, supplementing it by a ban on space tests of anti-satellite weapons, and an abandonment of the fruitless attempt to gain a capability to destroy the strategic retaliatory force on the other side.

The agreement between President Reagan and General Secretary Gorbachev to work toward a 50-percent reduction in strategic warheads is a good sign; it could be implemented within a year. Removal of all but one warhead from every ICBM or SLBM, and all but one bomb or air-launched cruise missile from each aircraft would reduce the number of strategic warheads on launchers to about 2000 on each side, and that could be achieved in two years.

The president's dream of defense substituting for deterrence by threat of retaliation and his administration's unwarranted commitment to a "larger component of defense" in the future, impair the prospects for improving security or even maintaining it at the present level.

We ought to return the SDI to a research program investigating what the Soviets might do to threaten us. If we are interested in reducing the Soviet threat, we ought to do it by example and negotiation rather than by an attempt at a partial defense which will only increase the threat to the United States, drain money which we badly need for our other defense efforts, and impoverish the country from the scarce resources of science and technology which can help us to better ourselves. ■

Answers to Written Questions from the Floor:

Q. How accurate is our intelligence on the location and number of Soviet nuclear ICBMs?

A. It is not whether they have 10,000 or 15,000 or 30,000, it is the assured capability of the U.S. to destroy Soviet forces and society in return which keeps the Soviets from attacking. The Soviet number is irrelevant, the important thing is to be able to retaliate and thereby to force the Soviet Union, whatever its goals, not to attack the U.S. or its allies.

Q. How do nuclear arms really make the world a safer place?

A. If we had no nuclear weapons, we'd have to match potential opponents by conventional weapons. We would have to fear biological weapons, chemical weapons, and just plain force of arms. Nuclear weapons for deterrence of organized states are good — they have helped for a long time. Nuclear weapons in the hands of everyone and of irresponsible states or substate groups are very bad things. That's why accompanying the reductions in nuclear weapons, we should have a very strong effort against the proliferation of them. That's why I think we should have a comprehensive ban on nuclear tests.

Q. Which is a more valid reason for discontinuing SDI — that the technology won't work and is too expensive, or that the research destabilizes deterrence?

A. The more valid reason is that the technology can too easily be countered by existing technology and by that which is being worked on. As a result it provokes a race resulting in more weapons. The countermeasures provoke instability.

Q. Please comment on the value of SDI as an eventual bargaining chip.

A. If SDI is a bargaining chip, that means you have to give it up in order to cash it in. In order to get the bargaining power, you have to be willing to give it up. Whether SDI has been of value in getting the attention of the Soviets and bringing them to the bargaining table can be argued. We can get the Soviets' attention and make them fearful in ways which are not in our own interest.

Q. Can SDI be used as an offensive system?

A. The real offensive use of an SDI system would be to augment a first strike. The Soviet Union fears the only real reason we might be working on SDI is to augment what it sees as an increasing disarming capability.

Q. Do you think it is possible the technological spinoffs alone might make the SDI program worthwhile?

A. The Apollo program was a tremendous challenge and technological success, as was the Concorde aircraft. This was the beginning of the Japanese ascendancy in technology and manufacturing. While our best people were concerned with spectaculars, their best people were looking at industrial and consumer technology. That's when they got their start. There is technological spinoff from research and development, but there is more spinoff when the program is not secret as the SDI program is, and there is more when it is closer to the problems that we encounter in everyday life. A conventional defense initiative to defeat Soviet tanks, artillery, and aircraft, would have a lot more spinoff and would be more directly useful as well.

Q. Was President Reagan's offer to share technology with the Soviet Union serious? It seems inconsistent for him to want to have anything to do with the Soviet Union let alone give away military research.

A. There is no one in the administration aside from the president himself who takes this seriously. But the president takes it very seriously. When you ask people in the defense department about preparations for sharing technology with the Soviets, they say the less said about that, the better.

Q. Does the U.S.S.R. already have an operational ABM system?

A. They do and have had it since the 1960s around Moscow. It is permitted under the 1972 ABM Treaty. The U.S. had an operational ABM system which was both larger and more effective than the Soviet system. We chose to deploy this, not around Washington, but around Grand Forks, North Dakota. After a year of operation, in 1975, we decided it was not worth the continued operating cost.

Q. How much does the Soviet Union spend in building a SDI defense?

A. According to CIA unclassified testimony, the Soviet Union spends about \$30 billion on strategic defense. But in the strategic defense category, only about \$1 billion per year is spent on SDI-like technology.

Q. How would one compare the scientific and technical capabilities of the Soviet Union with that of the U.S.? Do we underestimate Soviet capabilities?

A. Soviets have good scientists, but have very poor support. It's extremely difficult for them to take something beyond the theoretical stage and put it into production. They are at least 10 years behind the U.S. in computers. They have made nuclear weapons, they do have a good manned space flight program, they have done a superb job in sending probes to investigate the atmosphere of Venus and Halley's Comet, and they have a large conventional military capability. But their technology is way behind. We don't underestimate Soviet capabilities, in my opinion, very often we overestimate them.