Weapons Designers Challenge SDI Report

Lowell Wood of Lawrence Livermore and Gregory Canavan of Los Alamos call American Physical Society report "full of errors"; APS responds in kind

When the American Physical Society issued its report on the feasibility of President Reagan's Strategic Defense Initiative (SDI) in April, the weighty tome was generally hailed as the work of men who knew of what they spoke.

After all, the panel was composed of experts chosen from academic, industrial, and government labs, most of them intimate with the technologies they addressed. And while the study group concluded that at least a decade of research and major technical advances will be needed to determine whether space-based laser and particle beam weapons could effectively shield the United States from Soviet attack, even the SDI office in the Pentagon praised the study, though it did find their conclusions "unduly pessimistic" (*Science*, 1 May 1987, p. 509).

Now several vocal proponents of SDI, or Star Wars, are saying the physical society's report is not only pessimistic, but is a shoddy piece of work riddled with numerous errors, unrealistic assumptions, and blatant inconsistencies. And that's not all.

Commenting on the APS report before a congressional seminar, Frederick Seitz, a former president of both the APS and the National Academy of Sciences, compared the upcoming publication of the APS study in *Reviews of Modern Physics* to the decline of scientific standards in Nazi Germany.

Said Seitz: "Physicists with long memories will recall that when the Nazis came into power in Germany in the 1930s, the German physics journals . . . began to publish work of questionable quality. That was one of the earliest indications of the decline of German science in the pre–World War II period."

Seitz was on Capitol Hill 19 May to introduce Lowell Wood to members of the House Republican Research Committee. Wood is leader of O Division at Lawrence Livermore National Laboratory and one of the principal architects of the Star Wars vision.

Reading from a joint statement coauthored with Gregory Canavan, senior defense analyst at Los Alamos National Laboratory, Wood attacked the APS report as the questionable product of careless scientists with political axes to grind.

Said Wood: "We found large errors in critical aspects of the report—errors of factors of 10 to 100 on vital matters such as the power of the laser beam being developed by SDI research teams. These errors did not have a random character; they were all in the direction of making a defense against the Soviet ballistic missile attack seem harder than it really is."

Wood concluded his remarks by suggesting that since the council of the American Physical Society had entered a public policy debate, its tax-exempt status should be yanked.

All this was finally too much for Val Fitch, president of the APS. "I didn't want to dignify their statements with an answer, but when I got a letter signed by 39 congressmen expressing concern about our report, I felt it was time to reply," says Fitch.

Fitch answered the congressmen's letter on 19 June with one of his own, in which he called Seitz's allusion to the Nazis "a bizarre attack that has no place in a technical discussion." Adds Fitch, "Obviously this issue is becoming an exceedingly emotional one. Very strong feelings are causing some people to lose touch with reality."

In a nutshell, Wood and Canavan believe the APS study group's estimates of power requirements for various lasers and particle beam weapons are too high, thus making space-based defense seem extremely difficult. Wood and Canavan also take issue with the physical society's assessment of the practicality of Soviet countermeasures. Lastly, they state the procedure used by the APS to review its report was a biased one.

The APS study group strongly disagrees. Fitch accompanied his letter to the congressmen with a detailed response to Wood and Canavan penned by the original APS study group cochaired by Nicholaas Bloembergen of Harvard University and Kumar Patel of AT&T Bell Labs. About those criticisms raised by Wood and Canavan? The APS damns them as based on "erroneous physics coupled with groundless assumptions over the performance of unproven technologies."

The APS study group concedes only two points. In the first, the APS attached two conflicting numbers to the power levels achieved by tests of chemical lasers. The figure used in the main report contradicts the one used in the executive summary. Fitch maintains that the error appeared courtesy of an editing glitch.

In the second instance, ambiguous language led Wood and Canavan to analyze a wrong case. Both editing error and ambiguity will be changed in the final report published in *Reviews of Modern Physics*.

In their statement, Wood and Canavan also dismiss the countermeasures available to the Soviet missile designers that are discussed in the APS report, such as placing offensive warheads on fast-burning boosters, sheathing the missiles to protect them from lasers, and spinning the rockets to distribute the energy of the laser beams over a larger piece of missile skin.

Referring to one countermeasure, Wood and Canavan state, "Spinning boosters as an offensive countermeasure is the kind of suggestion which a bright physics undergraduate might come up with, but even a minute of thought by an individual who knows the basics of missile design reveals that this suggestion has very little merit."

Finally, Wood and Canavan assail how the report was reviewed for publication. Their main complaint seems to be that the study was not subjected to anonymous peer review. The APS report was reviewed by six very senior physicists, including Arthur Schawlow and Charles Townes, who won the Nobel Prize for their work on lasers.

Wood and Canavan contend, "As distinguished as these gentlemen are in physics, they are not expert in the technological fields under APS review; none of them have worked in these technology areas for at least the past quarter-century; indeed, none of them have ever worked on the military applications of directed energy at all."

Fitch replies that the society's report was reviewed in accordance with standard APS procedures. "Just like the National Academy of Sciences reviews its reports," says Fitch.

In his introductory remarks before the congressional committee, Wood said that "Facts are facts; physical law is physical law. Why should two groups of physicists, using the same facts and proceeding from the same physical laws, arrive at such different conclusions?"

That is a good question. At least part of the answer seems to be that the debate about SDI continues its steady drift from the technical to the ideological realm, where the questions are less about engineering than political stripe. ■ **William Booth**