fortunately the APS Council was not interested enough to make a statement.

I did, on behalf of the study group, report to the Nuclear Regulatory Commission. Four times the chairman of the NRC asked whether he should change emergency planning requirements. Each time I replied that the committee had not considered that matter in detail and deliberately did not want to give an opinion, although individuals, including myself, had opinions that we would be happy to provide personally the next day. I deliberately did not publicly state any views on nuclear power not included in the study group's report for another six months. As a result the report itself was widely read.

The APS Council is therefore not much worse than the Nuclear Regulatory Commission in not understanding clearly the important distinctions between assessment and management. But the NRC has such a bad reputation that that provides little consolation. It is, however, fortunate that several of my contacts in Washington have paid attention to the DEW study group's report but not to the statement of the APS Council.

RICHARD WILSON
Harvard University
7/87 *Cambridge, Massachusetts*

FITCH REPLIES: I sympathize with DEW study group members in their concern that the APS Council's statement on SDI might be confused with their own definitive report. Fortunately, there appears to be no evidence that this has happened in the press: While the DEW study received extensive coverage and generated much comment, the council statement appears to have been lost in its wake. I have seen only one reference to the statement itself—by Flora Lewis in the 7 July 1987 *New York Times*.

The Council of The American Physical Society planned for more than two years to issue a statement about SDI; such a statement was the subject of discussion at every meeting. It was always decided to wait for the DEW study's release before issuing anything, and that the statement was made public so soon after the study was released was an effect of one of the infrequent council meetings occurring shortly after the Pentagon approved the report's release. In retrospect, it might have been better if the council had not restated some of the conclusions of the study panel. It was always intended that the DEW study stand clearly alone.

I would like to take this opportunity to thank the DEW study panel publicly for their important report. It emphasizes the large amount of research still to be done before a judgment on directed-energy weapons can be made, and indirectly points the directions in which research money should be spent to be most effective. Most importantly, the report is as objective as humanly possible. As such, it will make a substantive contribution to the formulation of policy, and has considerably raised the level of discussion. The committee members have performed a monumental service for our country.

With respect to Richard Wilson's comments, when people are intent on discrediting a report for their own purposes there is scarcely no end to the mischief possible. I agree that the timing of the council statement may have made it easier.

VAL L. FITCH
The American Physical Society
8/87 *New York, New York*

The DEW study goes public

I have just received the announcement of the publication of the report of the APS Study Group on Directed Energy Weapons [see PHYSICS TODAY, May, page S1], with a cover letter by William W. Havens Jr. That letter asserts, among other things, that the study "is based on full access to all the facts." If that is in fact the case, please send me a copy forthwith, and bill me accordingly. But if, as I suspect, the Soviets have not cooperated fully in disclosing all their pertinent plans, I reserve the privilege of returning the report for a full refund.

As a member of the APS since 1944, as an APS Fellow since 1958 and as a former staff member at Los Alamos who in the early 1950s heard Hans Bethe assert that "if we don't build an H-bomb, the Soviets won't either," I have developed profound skepticism about the judgment of many members of the physics community in dealing with critical decisions on weapons development. One can predict with virtual certainty where everyone will stand (including myself!) based on the assumptions each person has made regarding the nature of our adversary.

Unfortunately, I cannot be even-handed on the score of prejudgment, because of the enormous asymmetry in the risks that are being taken. If I am wrong about the feasibility of SDI, we could merely fail to achieve a particular goal. But if the other side is wrong, and the Soviets achieve an effective defense, then we would soon be where

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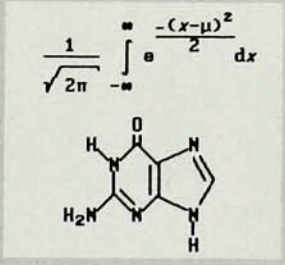

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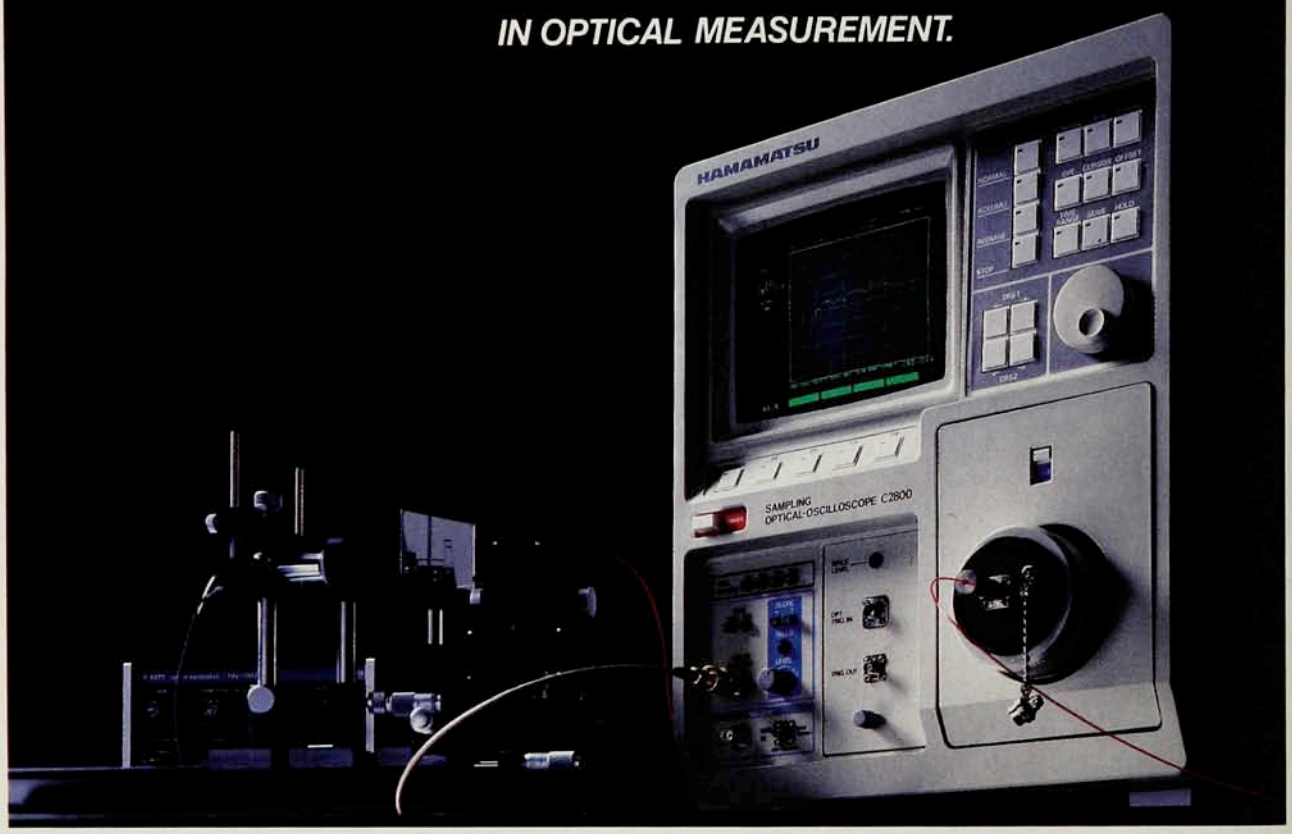

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we would have been if we had taken Bethe's advice of the 1950s: a slave state in the Soviet empire.

Another item of asymmetry is this: If we drive aggressively to solve the problem of SDI, we remain in the forefront of complex, demanding, sophisticated technology—the kind that has invariably produced all sorts of unpredicted side benefits in the past. If instead we stay on the sidelines, proclaiming that it can't be done, or that it is hopelessly difficult and expensive, we will have become effectively 20th-century Luddites. We are surrendering the "can do" psychology that has made the West the scientific–technological dynamo of history, and we are writing the penultimate chapter of the decline and fall of Western civilization.

So let us get going on SDI! Stop hobbling American creativity!

LAWRENCE CRANBERG
4/87 *Austin, Texas*

BETHE REPLIES: The remark about the hydrogen bomb that Lawrence Cranberg attributes to me must have been made in 1950. After the Teller–Ulam invention of the spring of 1951, it was clear to me that an H-bomb could be built both by us and by others, and therefore we had to do it. I frequently expressesd myself in this way, both at Los Alamos and at the meeting of the General Advisory Committee in Princeton in June 1951.

In its meeting in October 1949 the General Advisory Committee proposed negotiations between the Soviet Union and the US, with the idea that we both refrain from developing the H-bomb. If successful, such negotiations would have avoided this enormous escalation of the power of atomic weapons, which has greatly diminished the security of the United States.

Probably we won't ever know whether the Soviets would (or could) have developed the H-bomb if we had not done so; it is quite possible that fallout from our test gave them critical clues. In any event, Herbert York, in his book *The Advisors*, which is based on intensive study of all the facts and Russian publications, has shown in detail that even if the Soviets had developed an H-bomb first, they would have been unable to reach (let alone maintain) overall strategic superiority in nuclear weapons because we already had a much larger arsenal of powerful fission weapons.

Turning to SDI, the technical problems it faces are many. Nothing like the Teller–Ulam invention has occurred. Four years of intensive and ingenious research, supported by billions of dollars, have largely served to elucidate how difficult SDI's mission is.

I was not a member of the APS group investigating SDI, or even a consultant. The group formed technical judgments on the requirements for SDI development. It did not offer any opinion on the desirability of proceeding with SDI. And it did not try to make a comparison between our SDI and that of the Soviets. Concerning Cranberg's suggestion that the Soviets should have "disclos[ed] all their pertinent plans," I would hope that we in the US would not have opened our laboratories to a Soviet counterpart of the APS panel.

Let us use the can-do spirit in areas where we really can do, such as superconductivity and building automobiles as well as the Japanese do, or, in military technology, developing sophisticated, non-nuclear defensive weapons to counter the reputed Soviet superiority in tanks. And let us not forget that a great breakthrough in military technology, like the invention of the H-bomb, can quickly come back to haunt us.

HANS BETHE
Cornell University
8/87 *Ithaca, New York*

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I am not a member of the APS; I belong to the Optical Society of America. Not being a member of the former organizatin, I can't speak with firsthand knowledge, but somehow I suspect that it is not a "mere mouthpiece for leftist political propaganda," as syndicated columnist William Rusher suggested in discussing the APS directed-energy weapons study in his column of 4 May 1987. [See PHYSICS TODAY, June, page 55.] As a loyal reader of PHYSICS TODAY I have seen many subjects debated in your pages, including Velikovsky, creationism and even SDI. I'm proud to be a member of an organization that is alive with debate and controversy. Perhaps we should work on promoting a public image more in line with the variety of opinion within our organizations. Maybe then we could convince Rusher that the APS is still "a worthy organization."

WILLIAM J. RICE
5/87 *Laporte City, Iowa*

Of SSCs, shuttles and taxes

On the surface, the United States space shuttle program and the plans for a Superconducting Super Collider would seem to have little in common. But as your news story "Reagan endorses the SSC (March 1987, page 47) indicates, the political process by which one was approved holds lessons for the future of

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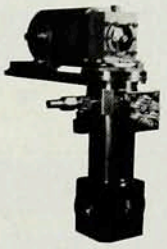

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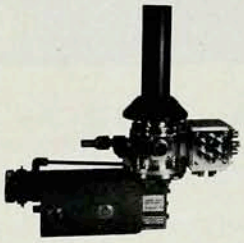

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