

letters

we constantly need to remind ourselves, and our students, of the good old saying *Caveat emptor*.

References

1. For example, it is included in *History of Physics: Readings from PHYSICS TODAY*, S. Weart, M. Phillips, eds., AIP, New York (1985), p. 243.
2. J. Ishiwara, Kaizo, February 1923.
3. J. Ishiwara, *Einstein Kyōzu-Kōen-roku* [The Record of Professor Einstein's Addresses], Tokyo (1923; reprinted by Tokyo-Tosho, Tokyo, 1971), p. 78.
4. O. Kamei, "Marginal notes to record of Einstein's addresses," unpublished manuscript of July 1985.
5. A. I. Miller, *Albert Einstein's Special Theory of Relativity: Emergence (1905) and Early Interpretations (1905-1911)*, Addison-Wesley, Reading, Mass. (1981).
6. See G. Holton, *Isis* 60, 133 (1969); reprinted in G. Holton, *Thematic Origins of Scientific Thought: Kepler to Einstein*, Harvard U.P., Cambridge, Mass. (1973), p. 361.
7. For example, see R. S. Shankland, *Appl. Opt.* 12, 2280 (1973).

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2/87

Peaceful alternatives to SDI

Einstein may have understood why Pugwash might not succeed in its mission of having concerned scientists from all parts of the world discuss the implications of nuclear war with a view to better informing and influencing world political leaders. To understand the political-military-industrial complex and the weapon system procurement maze is to understand the near-impossible task Pugwash, International Physicians for the Prevention of Nuclear War and others are facing. Einstein said,¹ on the danger of war, "It directly concerns every person. . . . We cannot leave it to generals, senators and diplomats to work out a solution over a period of generations." And in the last 41 years over 16 million people have been killed by wars, 400 000 per year.²

On the assumption that world leaders do comprehend the nuclear holocaust they are fueling, which will consume them, we can understand that they are damned if they arm, and damned if they don't. For every good reason to limit arms, the militarists of the world can create, if necessary, new reasons not to. Even though nuclear war can effectively destroy the world—

18 000 megatons is equivalent to 4 tons of TNT under everyone's bed—this alone is for them insufficient reason to disarm. Add to it all the hundreds of other good reasons to disarm; world leaders have shown for 40 years that they still cannot do it. World scientists and physicians, then, must no longer limit themselves to informing and influencing. They must now solve the problem that has proven too difficult for world leaders. We in the scientific community will have to show explicitly how it can be done without the world's killing itself in the process.

Despite the scare tactics used by experienced manipulators of public opinion, such as references to a "focus of evil," and despite the very tempting trillion-dollar SDI, we must show that there are other initiatives than weapon systems, and that trillions could be better spent for mankind and world peace.

From my own work I have found that there are alternative approaches that would considerably enhance national security from its present state, that would create a world in which poverty, malnutrition, ignorance and disease could be eliminated from the underdeveloped world, and in which peacetime industry would probably fully employ the developed world. (Consider what the great population of the Third World does not have.) I have found that it is possible to design an arms regulation plan that incorporates perfect perceived equality, closure of windows of vulnerability, force modernization and the structure for a perfectly balanced reduction to zero.

There are nonmilitary alternatives to President Reagan's request. I call upon the leadership of the American Institute of Physics and its member societies to respond to the President and search out these alternatives. He has called upon us for a means to render nuclear weapons "impotent and obsolete." In particular I call upon the American Association of Physics Teachers, where others, like myself teaching about nuclear war, may also have discovered alternatives. Those scientists who have signed off SDI research must also believe there are better ways. Shown alternatives, world opinion can require that world leaders choose them, and subsequently put their efforts into the enhancement of mankind worldwide. Or must we kill hundreds of millions of each other before we can establish friendly relations? If there were no nuclear weapons there would be no need for SDI.

I call upon AIP and AAPT to accept this challenge: at their next national meetings to sponsor daylong seminars for the elucidation of explicit alterna-

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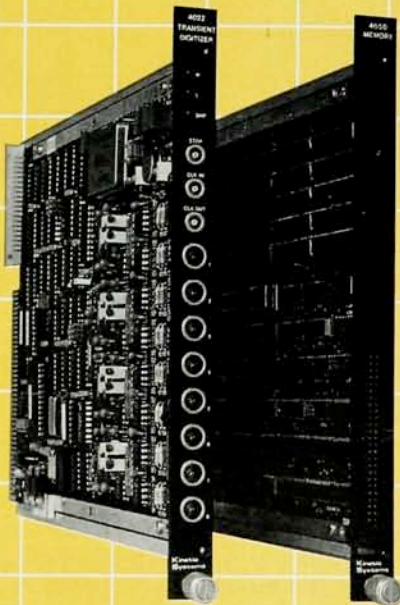
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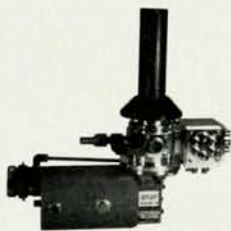
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PHYSICS TODAY / MAY 1987 15

letters

tives for making nuclear weapons obsolete. The objective solution of the war problem is not the responsibility of any branch of any government. Indeed, governments may discourage such attempts. Surely it is worth the try.

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Written in Hiroshima, Japan, August 1986.

References

1. A. Einstein, in *The Atomic Bomb*, H. W. Wilson, New York (1946).
2. R. L. Sivard, *World Military and Social Expenditures—1983 or 1985*, World Priorities, Washington, DC (1983, 1985).

RAYMOND G. WILSON

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8/86

Is Worden's word vulnerable?

In a letter in the July issue (page 13) Lieutenant Colonel Simon P. Worden, special assistant to the director of the Strategic Defense Initiative Organization, stated, "I have never said that the current submarine deterrent is vulnerable."

Worden and I were two of the speakers at a 30 April 1986 session of the spring American Physical Society meeting in Washington. During that session, before an audience of several hundred members of the APS, he stated that the submarine force was not invulnerable and could not be depended upon in the future. Thus, it appears that the truth of Worden's claim could be checked by polling the several hundred APS members who attended that session.

THEODORE A. POSTOL

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8/86

WORDEN REPLIES: If Theodore A. Postol would examine what I've said, both at the meeting in question and in other forums, he would find the following logic:

- ▶ No single submarine is invulnerable today.
 - ▶ The submarine fleet is sufficiently survivable today to do its deterrent mission.
 - ▶ The Soviet Union is working hard to make our submarines more vulnerable. I believe they will succeed in the future to such a degree that a deterrent based on submarine survivability will be very much in question.
- My statements on these matters have been consistent and I stand by them. I feel our fellow citizens would be

better served if physicist critics of SDI addressed our logic rather than trying to play quote games with our statements. Leave the quibbling to the lawyers.

SIMON P. WORDEN

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3/87

June cover: Laser lab safety

On the cover of the June issue of PHYSICS TODAY there is a color picture of an instructor and students in an undergraduate physics laboratory, happily engaged in manipulating what might be a dye laser. While the power level of the laser is not specified, the photograph suggests substantial intensity. There is not a laser goggle in sight. The students and the instructor display a level of machismo appropriate to combat infantrymen advancing under sporadic sniper fire.

There is a black and white picture of some industrial physicists involved in laser manipulations on page 58 of the same issue. These cowardly types (no offense meant, fellows) are all attired in uncomfortable protective goggles, which prevent them from enjoying the full beauty of the laser beams.

There must be a moral in these two pictures. There are many reasons for not wearing safety goggles, and students seem to know them all. On the other hand, the only reason for wearing the goggles is to safeguard one's eyesight. Unfortunately, good vision is an ability that is most appreciated after it is lost.

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7/86

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I found it of particular interest that in the June issue several photographs of university laboratories (the cover and pages 25, 40, 44 and 75) show students in laboratory situations where safety equipment is obviously lacking—particularly safety glasses for those using laser equipment. This is in stark contrast to the photographs of the industrial labs (pages 58, 60 and 62), where safety equipment is properly in use. Does this suggest that nowhere in the "education of a physicist" do students receive safety training? And that it is only in industry that safety is a significant aspect of the work?

I would strongly recommend that in the future PHYSICS TODAY refuse to print photographs of laboratory situa-

continued on page 124