

Letters

Nuclear Non-Proliferation

Retardation of the spread of nuclear weapons to other nations is a matter of intense concern to Congress. Despite an apparent lack of public interest, non-proliferation is the priority issue for many congressmen (1). Thus, in considering the Administration's trial balloon on the use of commercial spent fuel as a source of weapons-grade plutonium with the aid of laser isotope separation, I find the testimony of Gerard C. Smith (2) at the hearing of my subcommittee on 1 October 1981 (News and Comment, 16 Oct., p. 307) most compelling.

During the 1967 negotiations for the Non-Proliferation Treaty (NPT) and its provisions for safeguards under the International Atomic Energy Agency (IAEA), the United States offered to place our peaceful nuclear facilities under the same safeguards, albeit reserving the legal right to use the special nuclear materials any way we see fit. An agreement to this effect between the United States and the IAEA was ratified by the Senate in 1980.

Thus, we helped to set up the international safeguard program under the IAEA and the NPT to keep account of commercial nuclear materials to ensure that they are not diverted to weapons use, agreed to have our commercial nuclear plants safeguarded in the same way, as a good example, and now we propose to divert openly our commercial materials into weapons channels. In Ambassador Smith's words: "it would be a horrible example if the inspectors from the IAEA were periodically reporting diversions from our nuclear power plants for military purposes, when all over the rest of the world their function would be to try to discover such diversions which would be illegal under the terms of the treaty."

I am surprised that Richard L. Garwin (Letters, 1 Jan., p. 6), an opponent of routine reprocessing who is well aware of the dangers of proliferation, favors the reprocessing of commercial reactor fuel to meet the needs of the weapons-grade plutonium stockpile rather than the building of a new military plutonium production reactor. While he expresses concern that this will encourage general reprocessing as proposed by the Admin-

istration (3), he does not comment on Ambassador Smith's argument.

I fear that we cannot preserve the non-proliferation regime in the world if we mine commercial spent fuel for plutonium for military purposes. This action would demonstrate to the world how to move from Atoms for Peace to Atoms for War and could readily result in a growing number of nations in possession of nuclear weapons. Such encouragement for proliferation presents a serious danger to our national security which must not be ignored as the Administration considers the need for a further expansion of the U.S. nuclear stockpile and ways to obtain it.

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References and Notes

1. E. Moynihan, *New York Times Magazine*, 15 November 1981, p. 151.
2. The text of the 1 October 1981 hearing, "Proposals to obtain plutonium from commercial spent nuclear fuel for U.S. nuclear weapons," is available from the subcommittee on oversight and investigations.
3. The text of the 23 October 1981 hearing, "The Reagan Administration's nuclear fuel cycle policy and the future of nuclear power," is available from the subcommittee on oversight and investigations.

Technological Manpower

In his editorial about the proposed 12 percent across-the-board budget cuts for government agencies (16 Oct., p. 261), Frank Press raises two basic questions for the scientific community. What case do we have to resist cutbacks in research funding, and how should the case be heard? One consequence of the proposed cuts may be spelled out rather easily—they will affect technological manpower.

The majority of doctoral students in science and engineering work their way to a Ph.D. as research assistants on government-funded research projects. So the proposed cuts in the budget base for university research translate directly into a cut in the production of Ph.D.'s. The current reduction of more than \$60 million in the budget of the National

Science Foundation—under half the cost of one B-1 bomber—may be conservatively estimated to lead to a loss of more than 500 Ph.D.'s per year.

Unlike the consequences of the loss in basic research discoveries resulting from these cutbacks, the loss of technological manpower will be felt relatively quickly—in 3 to 5 years. Since there are already manpower shortages in certain areas of computer science, electrical engineering, and microbiology, this loss will undoubtedly reduce our competitiveness in high-technology industries and our ability to fulfill national goals in areas such as defense and health.

In the words of President Reagan's Science Adviser George Keyworth: "The scientific and technological base of this country is primarily its talent." Isn't a reduction in training of skilled people the social equivalent of burning our seed-corn? Budget Director David Stockman has said: "Power is contingent . . . unorganized groups can't play in this game." It's time for all of us involved in graduate education to come off the fence and lobby effectively for protection of this vital national resource.

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Fetal Alcohol Advisory

The article "Fetal alcohol advisory debated" by Gina Bari Kolata (Research News, 6 Nov., p. 642) purports to show that researchers in this field are divided on the advice given by the Surgeon General to pregnant women. The opinions of five respected scientists are presented. Four (Rosett, Sokol, Kline, and Abel) either take issue with the Surgeon General's advisory or discredit the validity of the studies on which it was based. However, there are many other researchers of equal stature who strongly support the Surgeon General's position. Among these are Ann Streissguth and her colleagues, whose comprehensive review of the field was published in *Science* (18 July 1980, p. 353); another is Sterling Clarren, a dysmorphologist and one of the leading experts in the world on the diagnosis and treatment of fetal alcohol effects.

In addition, I know of no reputable study showing that 8 percent of women of childbearing age are "alcoholics." Even if this were true, assuming that the same proportion (8 percent) of the subjects in the Harlap study was alcoholic is

unjustified, since this sample was drawn from a very special population—members of a health maintenance organization who seek early prenatal care.

What began many years ago as legitimate differences among researchers has grown into a debate so acrimonious that many talented investigators have left the field. I call for a truce, with the time saved in fighting each other devoted to developing an effective method of validating self-reported drinking estimates. With such a method, we shall better know where the truth lies and how women may best be advised to conduct their pregnancies to protect themselves and their developing child.

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... Kolata has done a superb job of reporting and writing. Her article is very well balanced and, while I do not agree with all of the statements in it, I believe it to be an extremely fair and unbiased assessment of the current state of knowledge.

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Resolution of Phosphorus Chemists

We wish to report the response of the International Conference on Phosphorus Chemistry, an independent body that assembles about every 2 years, to the action by the Institut Mondial du Phosphate (IMPHOS) regarding the arbitrary deletion of the papers of two Israeli scientists from the published proceedings of the IMPHOS-sponsored conference held in Boston in April 1980 (Letters, 23 Oct., p. 390). The last International Conference on Phosphorus Chemistry was held at Durham, North Carolina, from 1 to 5 June 1981 and was jointly sponsored by the American Chemical Society and the International Union of Pure and Applied Chemistry. The IMPHOS action of censorship for political reasons caused great concern, and at its closing session the Conference unanimously adopted the following resolution:

It has come to the attention of the Organizing Committee of the 1981 International Phosphorus Conference that IMPHOS has excluded from the published proceedings of its 1980

Boston meeting the manuscripts of the orally presented papers of two Israeli scientists, Dr. Nathan and Dr. Ketzinel.

While we heartily commend IMPHOS on the fine spirit of international cooperation which characterized its meeting in Boston, we strongly disapprove of the last-minute decision to remove the papers of the two Israeli scientists from the published proceedings. This unfortunate act of censorship is in direct and blatant conflict with the spirit of unpoliticized scientific inquiry, which for the good of mankind must continue to characterize the interactions of scientists. If it is still the desire of IMPHOS to enlist the participation and good will of phosphorus chemists on a truly international basis, it should renounce its policy of censorship.

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Biomedical Research Funding

The biomedical research communities in our universities, medical schools, and hospitals are facing a serious dilemma which could have far-reaching consequences unless resolved satisfactorily.

Government has provided a remarkably successful funding mechanism for the biomedical sciences through the agencies of the National Institutes of Health and the National Science Foundation in particular. This has permitted spectacular advances in understanding basic biological principles and has provided important technology for the understanding and treatment of disease. This government-organized mechanism has also provided a remarkable degree of intellectual freedom essential for scientists to function creatively.

In the name of economic emergency

the government has begun a serious, across-the-board reduction in support of research and simultaneously has encouraged the research community to seek funding from the private sector. These two developments may or may not have been synchronized but have resulted in a sudden and rapid increase in a variety of interactions between academia and industry. Government agencies and members of Congress have become worried about the possibility that knowledge, the acquisition of which has been heavily and effectively supported by taxpayers' dollars, will be transferred to industry for commercial profit. Interpretation and proposed implementation of a recent patent law would make it extremely difficult for a scientist to be supported by both sectors and perhaps impossible for industrial investigators to effectively collaborate with researchers funded by government agencies. The new law requires an accounting of the origin of every dollar applied to any particular project, the clear implication being that any government funding involved will invalidate contractual arrangements with the private sector.

The government cannot have it both ways. Since it will not provide adequate support for academic research, we may quickly lose to industry the cutting edge of the national academic effort. We are in serious danger of an academic brain drain to industry. With increasing access to university laboratories through contractual arrangements and an ability to provide better salaries with the promise of developing excellent in-house institutes, industry may well entice away our best young scientists. The market must remain open, but universities must also remain competitive.

The inclusion in each contract (and perhaps even consultation agreement) of an additional, significant unencumbered contribution to the recipient institution, solely for research, would help redress the balance. Tax incentives would encourage this practice.

In any event, it is quite unlikely that the private sector can substitute for effective government support of basic research in the universities. It is therefore essential that seeming conflicts of interest between government and industrial modes of research support be resolved so that our present international leadership in biomedical science will not evaporate.

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