LETTERS

Nuclear Weapons Materials

Harold Agnew's letter "Tritium production" (5 Feb., p. 612) and Richard Garwin's earlier letter "Plutonium production" (1 Jan., p. 6) show the need for public assessment of the adequacy of our present stockpiles and the extent of future requirements for nuclear materials in our nuclear weapons program. Garwin, while bypassing the question of whether we need additional plutonium, supports the development of laser isotope separation technology for obtaining "weapons grade" plutonium from civilian spent fuel as an economic alternative to building new plutonium production reactors. Agnew agrees with Garwin's views on plutonium requirements, but he extends a call for the planning and budgeting of a new production reactor to supply tritium.

We suggest that the output from our existing production reactors at Hanford and Savannah River and the nuclear material recovered annually from weapons retired out of our burgeoning stockpile of 26,000 nuclear weapons are sufficient for the plutonium and tritium needs of weapons planners and designers for several decades to come.

In recent years, the three operating production reactors at Savannah River have been adding an estimated 1400 kilograms of weapons grade plutonium annually to the defense stockpile of some 100 ± 20 metric tons. And tritium is also being produced in these reactors, in the lithium control rods, at a rate of about 3 kilograms per year, which is presumably enough to preserve a stockpile. However, as much as 20 kilograms per year could be obtained from runs dedicated to the production of tritium in lithium targets in the three reactor cores, something that did not occur at Savannah River between 1972 and 1981 (*1*). Also residing in the defense stockpile are some 500 to 700 metric tons of high enriched uranium that were built up before 1964, although plutonium is now favored over high enriched uranium as an "efficient" material for nuclear warheads.

Our materials production capacity should experience a sharp jump when the upgrading and restoration program for the three operating reactors is completed, the L reactor at Savannah River is restarted in October 1983, and the N reactor at Hanford is converted to the production of weapons grade plutonium with the restart of the PUREX reprocessing facility in April 1984. A further option being considered for Savannah River would increase plutonium production by 25 percent by replacing the mixed oxide core of highly enriched uranium fuel assemblies and depleted uranium targets with a uniform core of 1.1 percent enriched uranium and increasing the reactor power (*2*). This combination of actions could provide as much as 3200 kilograms of plutonium annually by the middle of 1984, more than doubling current production.

After the facility upgrading, production of tritium in lithium control rods during plutonium runs at the Savannah River reactors would continue to maintain the tritium stockpile. Occasional dedicated tritium runs, yielding as much as 30 kilograms annually from the four Savannah River reactors, could build a stockpile of tritium for defense purposes that would be adequate for decades, despite tritium's 12.3-year half-life. The urgency in Agnew's call for more tritium production capacity is possibly based on his claim that 10 percent of the tritium stockpile decays each year. Using the correct value of 5.5 percent decay per year might well double his estimates of the lifetime of the present tritium stockpile as well as the size of the tritium stockpile that can be maintained with production in the control rods (and an occasional dedicated tritium run) at Savannah River.

A determination as to whether we need new production facilities turns on whether we can design and maintain "exotic enough" nuclear weapons with the quantities of materials we already have. Surely our national laboratories can design the weapons needed for our national security while working within the scope provided by the material in our stockpile and the existing production facilities. Will our strategy of nuclear deterrence (or even a first strike capability) in any way be diminished by not proceeding to plutonium laser isotope separation and costly new production facilities for weapons materials?

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References and Notes

1. As of May 1981, one dedicated tritium run was planned for the latter part of the year.
2. *Inside Energy*, 27 November 1981. Another option is to blend supergrade plutonium produced at Savannah River with up to 8 metric tons of fuel grade plutonium stored at Hanford in a 2 to 1 ratio to produce weapons grade plutonium.

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Assessing Agricultural Research

Nicholas Wade (29 Jan., p. 483) describes the Office of Technology Assessment's (OTA) report on the U.S. agricultural research system (*1*) as being "lackluster." This adjective also very well describes Wade's critique of the report.

Wade takes OTA to task for not placing more emphasis on the Pound report (*2*)—a 1972 analysis of the status of agricultural research. A thorough discussion of OTA's findings with program staff would have revealed why OTA placed lesser credence on the Pound report.

The OTA assessment of agricultural research represents the findings of a select group of intelligent, perceptive people from all segments of agriculture—both public and private. They spent hundreds of hours researching, discussing, and analyzing the problems of the U.S. agricultural research system. As editor of the OTA report, I disagree with the implication that these people missed the mark. The Office of Technology Assessment is one of the most honest and conscientious government agencies in Washington.

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References

1. *An Assessment of the United States Food and Agricultural Research System* (Office of Technology Assessment, Washington, D.C., 1982).
2. *Report of the Committee on Research Advisory to the USDA* (National Academy of Sciences, Washington, D.C., 1972; available from the National Technical Information Service, Springfield, Va.).

Transamazon Highway: Impact on Indians

While reading Nigel J. H. Smith's article "Colonization lessons from a tropical forest" (13 Nov., p. 755), I was troubled to note that the discussion of the social, economic, and ecological impact of the Transamazon Highway project does not include mention of the cultural and physical destruction of the Amazonian Indians.

At the inception of the Transamazon project, the recognition of the danger to the indigenous population prompted the Brazilian government to establish the National Indian Foundation (FUNAI). This government bureau was given the responsibility for the protection of the Amazonian Indians and is a successor to previous, maladroit efforts meant to protect the indigenous population.

Public statements by Brazilian bureau-