Letters

Nuclear Proliferation

Robert Gillette's account (News and Comment, 25 July, p. 267) of the Bechtel Power Corporation's efforts to capture the Brazilian enrichment gear market was fascinating. While this may arouse the ire of the censorious, it must be recognized that the failure of the United States to meet the demand of many nations for domestic enrichment facilities is actually contributing to the proliferation problem.

The attitude of Washington is strange, in view of the fact that the Administration has made an obsessive fetish of the nonproliferation issue. From the security standpoint, Washington is still living in the 1950's; policy is still dominated by political considerations, and the age-old tendency to equate secrecy with monopoly still prevails.

A brief review of the characteristics of enrichment gear is illuminating. With gas diffusion, the size of the units and barrier tubes depends on the pressure-volume parameters at each stage. Thus, a plant that is designed for fuel enrichment only cannot be used to produce explosive-grade uranium in appreciable amounts. There simply will not be a sufficient volume of the material to recycle through the large low-enrichment units on a regular basis.

Suspicious minds may be prone to the belief that the purchaser can break the barrier tubes open and find out how they are made; it is no secret that the barriers are made out of sintered nickel. The catch is that the metal is sintered in the precise way necessary to achieve the desired uniform porosity. This information naturally is not exported with the plants.

Thus, the standard gas diffusion plant is relatively safe, from the "proliferation" standpoint. "Export" model gas diffusion plants can be turned out and leased or sold under conditions of International Atomic Energy Agency inspection; however, the situation with the West German Becker gear, which involves constant volume, is much less certain. The efficiency depends to some extent on blade settings, but because there is no great difference between the volumes needed throughout the stages from low to high enrichment, the recycling potential with the Becker blades is obviously much higher.

While Washington was contemplating its political belly button and pondering the higher mysteries of nonproliferation, American developers who could have provided an essentially nonproliferatable form of enrichment were beaten to a foreign market by West German developers who had perfected a substantially more proliferatable method.

The real policy question that remains to be settled is not whether the export market shall or shall not be satisfied, but whether we will allow the export of known and controllable hazards, or maintain our negative and censorious attitude about nuclear equipment. Withholding enrichment gear solves no problems; it can only become a provocation to many nations to fund large-scale research efforts under the banner of "energy independence," which may lead to unpredictable and potentially dangerous results.

One of the first principles of effective political negotiation, taken for granted in the ward days, but almost forgotten by the current generation is "Never attempt to control anyone by threatening to withhold something from him—he may find out he can get along without it."

This principle should be kept in mind when further developments in enrichment technology are evaluated.

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Indian Corn Cultivation

Contrary to the views presented in Lynn Ceci's article "Fish fertilizer: A native North American practice?" (4 Apr., p. 26), a review of the history of southern New England Indian corn cultivation reveals that Indian use of fish fertilizer is a well-authenticated fact. In the spring of 1621, at newly settled Plymouth on Massachusetts Bay, the Indian Hobomock introduced the Pilgrims to Squanto, the only surviving native of the Indian village site which the Pilgrims had taken over for their own. Able to communicate in English, and well-versed in local agriculture, Squanto instructed the agriculturally illiterate Pilgrims how to plant the maize or Indian corn seed they had earlier gotten on Cape Cod. He had them seine quantities of the teeming herring run in Town Brook and throw up the soil of 20 formerly Indian-tilled acres into mounds. Then he taught them to place beneath each hill several of the fish as fertilizer before planting the seed.

Plymouth Governor Bradford's graphic account (*1*) provides this testimony: "Squanto stood them in great stead, showing them both ye manner how to sett it [the Indian corn seed] and after how to dress and tend it. Also he told them except they got fish and set with it (in these old grounds) it would come to nothing."

Winslow, later to become Plymouth's governor, records the auspicious outcome (*2*). "We set the last spring some 20 acres of Indian corn and according to the manner of the Indians we manured the ground with herrings or rather shads which we have in great abundance." By the time of writing, 21 December 1621, the Pilgrims had gathered their first harvest. Manured and cultivated as Squanto had advised, the crop of Indian corn had done well, and Pilgrims and Indians celebrated Thanksgiving. By contrast, the field of English grain alongside, with no manuring mentioned, was an almost complete failure.

Additional evidence of fish fertilization as a customary native Indian practice was provided by a distinguished Puritan, John Winthrop the Younger. He arrived in Massachusetts Bay a decade later, became a founder of coastal Ipswich, and for years was governor of Connecticut. The first resident American member of the Royal Society of England, he described in a detailed and illuminating communication to the Society in 1666 (*3*) how maize is grown. Of fish manuring he states flatly: "The English have learned this good husbandry of the Indians and do still use it in places where the Mooses (herring) come up in greate plenty."

He also mentions that the English put both codfish garbage left near fishing stations and cattle dung, well-rotted, under the maize hills. After the maize crop was harvested and the land plowed, the soil became "well fitted for English Corne, specially Summer graine, (as Pease or Summer Wheate)." Two centuries later, seaboard New England farmers still held to this "good husbandry."

Ceci theorizes that Squanto had learned fish manuring, not as a child working with his mother and the Indian women, but rather in the course of his foreign wanderings, as a captive in Spain and later in England and Newfoundland.

However, Europe's farmers for centuries had sown their grain broadcast or in drills, and on plowed fields, not in hills. Then they