

300 and 400 nuclear warheads. About 120 missiles are ground-based, a number of which are hidden in caves. Another 250 warheads could be delivered by some 120 antiquated but still quite effective aircraft. China also has two submarines which could launch up to 12 missiles each. Said Fieldhouse: "Only a handful of these are capable of reaching either Moscow or North America, though China has a robust ability to retaliate in Asia." Fieldhouse believes that "survival of Chinese forces under any conceivable attack is assured."

Moves by the United States and the Soviet Union to reduce intermediate-range nuclear forces (INF) in Europe and Asia have been given qualified support by China. "The INF treaty is a breakthrough in a long stalemate," said Zhen-Qiang Pan of the National Defense University in Beijing. Though Pan described the actual reduction in weapons as "insignificant," he did say that the INF treaty plays an "active role in reducing tension." Fieldhouse, however, stressed that the INF treaty is good for China, since it removes 171 Soviet SS-20 Saber missiles deployed east of the Urals. These missiles could reach China as well as Alaska and Japan.

As for the further cuts in nuclear weapons by the United States and the Soviet Union, Hua maintained that even a 50% cut would only provide "short-term psychological benefits." He said that China would not begin reducing its own forces until a 5-to-1 or even a 3-to-1 ratio between the superpower nuclear forces and its own was achieved. Pan added that any quantitative cuts must be accompanied by assurances from both superpowers that they would also stop enhancing the quality of their weapons. "Only by doing that can real arms control be achieved," said Pan.

Both Pan and Hua argued that the Strategic Defense Initiative (SDI) was destabilizing. "Star Wars must not become a reality," said Hua. "China as weakest among the second class nuclear countries should speak strongest against SDI . . . We cannot permit China to become strategically obsolete," he said.

There were also some pointed questions from the audience at the end of the session about China's alleged sale of Silkworm missiles to Iran. While maintaining that China did not directly sell the weapons to Iran, Pan said with some bitterness: "I do not like my country being described as a naughty boy in the process of maturity . . . like somebody who still needs to learn some lessons." Pan said the United States and Soviet Union have been selling weapons to Iran and Iraq for the past 8 years. "Why is China singled out?" ■ **W.B.**

## Using Forests to Counter the "Greenhouse Effect"

Virtually nothing is being done at present to protect the earth against an esoteric and possibly catastrophic problem called the "greenhouse effect"—the buildup of heat in the atmosphere caused by an excess of carbon dioxide (CO<sub>2</sub>). The chief man-made source of CO<sub>2</sub> is fossil fuel burning. Several speakers at a special session at the AAAS meeting suggested methods of attacking the problem, aside from the obvious one of reducing the use of fossil fuels. Admittedly, their proposals are a bit impractical because they would encounter opposition on economic and political grounds. But they have the virtue of being the only proposals on the table, and if the CO<sub>2</sub> problem becomes bad enough, they may get attention.

One intriguing idea, presented as a quick fix by Gregg Marland of the Oak Ridge National Laboratory, calls for a rapid reforestation of the globe. The aim would be to recapture in trees much of the carbon released into the atmosphere by burning coal and oil. Plants can fix atmospheric carbon by photosynthesis, and trees are able to fix more carbon per hectare (without fertilizer) than any other plant.

Marland first proposed this idea in 1976 along with physicist Freeman Dyson. Since then he has refined his calculations to show that by roughly doubling the volume of forest growth per year, the major fuel burning nations could delay the onset of the greenhouse effect for a decade or two, if they acted decisively. This would allow time for permanent changes in energy use. He judges this to be a difficult, unlikely, and expensive project, but not physically impossible. He also claims that this might be the most acceptable of a group of unpopular remedies to the CO<sub>2</sub> problem.

Marland's emergency scenario includes a number of assumptions that make it appear impractical. For example, as a starting condition, the destruction of existing forests—particularly in the tropics—must be stopped. But at present, the less developed world is tearing down forests at a rapid pace. According to the best estimates, the total inventory of trees has almost been halved since the beginning of agriculture. In the tropics, which comprise more than 30% of the earth's surface, forests are being cleared at the rate of 7 to 20 million hectares per year. If the populations of tropical countries continues to grow at a rate of 2.4% per year, the demand for fuel wood will increase tremendously. To carry out this program, the most populous nations would not only have to invest heavily in tree farms, but, in addition, they would have to refrain from

burning the wood.

Yet, the scenario is not entirely fantastic. In the industrialized Northern Hemisphere, commercial lumber plantations have restored once depleted tree stocks. For example, in 1970, the forest area in New England, although smaller than in the pre-colonial era, had increased by 40% over the amount in 1890. And in the 1950s, a steady decline in forested area in the southeastern United States was reversed and began a slow but steady growth that has persisted ever since.

"The dimensions of the fix are staggering," Marland writes. And he concedes that a huge tree-growing push does not seem economically justifiable. But he concludes that "reforestation could . . . play a significant role as one component among a variety of measures taken to address increasing CO<sub>2</sub>." Unfortunately, the other measures suggested at the AAAS meeting—such as rapidly increasing the number of nuclear fission plants or installing costly CO<sub>2</sub> capture equipment at fossil plants—seem no more likely to win acceptance. ■ **E.M.**

## A No-Fault Proposal for AIDS High Risks

LeRoy Walters is a soft-spoken and unassuming academic, but that did not stop the Georgetown University ethicist from suggesting that homosexual acts, drug use, and prostitution be decriminalized in an attempt to stem the AIDS epidemic.

To control the rapid spread of the human immunodeficiency virus (HIV) among intravenous (IV) drug abusers, Walters would like to see users provided with carefully limited access to injectable drugs accompanied by a simultaneous decriminalization of IV drug use. Walters believes that this would bring addiction and its social context above ground. "Every Administration declares a war on drugs, but thus far it doesn't seem as if drug addiction has been greatly ameliorated," said Walters, who spoke at a AAAS symposium entitled "AIDS: An Overview." Walters stressed that approaches towards controlling AIDS should be pragmatic and experimental, not dogmatic and moralistic. Earlier in the symposium, James Curran, head of the AIDS program at the federal Centers for Disease Control in Atlanta, remarked, "If we really want to do something about IV drug use we have to do something big." Walters' suggestion was certainly big.

On to prostitution. Walters advocated an approach similar to that taken by some European countries and several counties in Nevada, where prostitution is legalized and