

the focus of a mutual effort at closing the gap also came to naught, in part because France was in the process of disengaging itself from NATO's military side.

The French withdrawal was more selective than was generally realized at the time. While France pulled out of NATO's joint military command it, for example, remained and remains an active member of the science committee, as does Greece, which more recently did a partial pullout on the Cyprus issue.

Incidentally, echoes of the technology gap were raised by A. Danzin, director

of the French Institut de Recherche d'Informatique and et d'Automatique in remarks on information technology when he alluded to an "information oligopoly" held by U.S. companies, notably I.B.M., and said that Europe will suffer economically unless it does better.

The consensus among the invited commentators seemed to be that the science committee should occupy itself more with technology, that social scientists should be more strongly represented in its activities, and that the committee and NATO should find ways to tackle com-

plex, long-range problems facing the alliance. To do this it seemed generally agreed that more money is needed. Whether this will be forthcoming it is far too early to say. Frank Press was complimentary, but diplomatically non-committal in his parting remarks, and the head of the German delegation, whose country is the other major financial patron of the organization, made closing comments which were taken as favorable. A clearer signal is possible, however, when NATO heads of state meet in Washington late in May.—JOHN WALSH

Poisoned Pot Becomes Burning Issue in High Places

Following a discovery that Mexican marijuana contaminated with the herbicide paraquat constitutes a major health hazard for pot smokers in the United States, the State Department recently sent a delegation to Mexico City to discuss the issue with Mexican attorney general Oscar Florez.

The visit came on the heels of a warning by the U.S. Secretary of Health, Education, and Welfare (HEW) that the herbicide persists in the smoke of a contaminated marijuana cigarette and may be inhaled by the smoker. The paraquat contamination is so serious that those who smoke as few as one to three contaminated cigarettes daily for several months risk irreversible lung damage.

Members of the U.S. delegation did not—as some American critics have sought—ask the Mexican government to cease the herbicide spraying program, which is aimed at eradicating illicitly grown marijuana and heroin. The program is overseen and heavily financed by the U.S. government (*Science*, 28 February). "We just wanted to inform them of the dimensions of this problem in the U.S.," said Richard Arellano, a deputy assistant secretary at the State Department.

A major topic of discussion at the meeting, in addition to the health hazards, was a lawsuit recently brought by the National Organization for the Reform of Marijuana Laws (NORML) to force the State Department to stop funding of the spraying until it files an envi-

ronmental impact statement. Several well-informed officials told *Science* that the department is extremely nervous about the suit, which is regarded as likely to succeed. If it does, the precedent would destroy the department's claim that projects it funds in other countries are exempt from the impact-statement requirements. "The State Department regards this as the worst case that could come up," said one source, "because the spraying program is having an obvious impact here at home."

At the meeting in Mexico City on 30 March, American officials had a difficult time persuading the Mexicans that the lawsuit could prevent continued U.S. funding for the herbicide program. "The Mexicans couldn't understand how our judicial system could even entertain the suit, considering that marijuana is already an illegal substance," said Arellano.

A team of U.S. scientists is searching for an alternative to paraquat, but the federal court suit will probably be resolved before they are successful. In particular, they have been looking at formulations of the herbicides 2,4-D and glyphosate, but each possibility is said to require additional safety testing that could delay the substitution for months.

Initially, officials of the National Institute on Drug Abuse reported that paraquat posed no particular hazard, because it was thought to be converted entirely into another chemical, bypyridine, when a contaminated cigarette was burned.

Bypyridine exists commonly in smoke from a tobacco cigarette and is not considered to be particularly hazardous. Recently, however, scientists at the Research Triangle Institute in North Carolina were able to analyze the smoke from a contaminated marijuana cigarette with a mass spectrometer. They discovered that roughly 5 percent of the paraquat remains in pure form after burning. Coupled with the discovery that recent samples of marijuana entering the United States from Mexico contained a concentration of paraquat as high as 2264 parts per million, this evidence was alarming. Tests showed, for example, that in a cigarette with a contamination of 1000 parts per million, 0.26 microgram of the herbicide is likely to be inhaled by the user.

An estimate of the dangers to humans of inhaling such an amount was extrapolated from laboratory studies with rats, because most cases of paraquat poisoning in humans have been caused by ingestion, not inhalation, of the chemical. The laboratory studies demonstrated that when an exceedingly small amount of the herbicide was placed directly on the rats' lungs, it caused fibrosis, or a scarring that inhibits the ability of the lung to absorb oxygen. At the low doses in contaminated marijuana, the scarring in humans would build up slowly, and it would be some time before the only probable symptom—extreme shortness of breath—would be noticed.

As yet, no instances of fibrosis attributed to the poisoned marijuana have been reported. However, doctors at the Center for Disease Control (CDC) in Atlanta, which is attempting to serve as a clearinghouse for physicians with patients who have been smoking the poisoned pot, have received reports of other ailments that may be related to the contamination. Specifically, physicians in Georgia, Iowa, and California have re-

Accounts May Get Professor Fired

A respected social science professor at the University of Colorado, J. Eugene Haas, is fighting a university move to dismiss him because he allegedly falsified travel vouchers to have his federal grant pay for a vacation in Hong Kong with a female associate on his staff.

The case is causing some raised eyebrows in Washington among members of Congress who are increasingly concerned with whether the government can keep tabs on how its research money is really spent. Senator William Proxmire (D-Wis.), who heads an appropriations subcommittee with responsibility for the National Science Foundation (NSF), which sponsors Haas's work, recently asked NSF witnesses some hard questions on the Haas situation. NSF over the years has awarded Haas more than \$2.65 million, and its 1977 audit of the professor's private company turned up irregularities. Proxmire also chided NSF for not having acted more vigorously when a 1976 NSF report claimed Haas was regularly charging NSF for more than 100 percent of his time.

Haas specializes in the social and public policy aspects of natural disasters, such as earthquakes and man-induced natural events such as weather modification. More recently, he has obtained generous grants in the mushrooming field of the social implications of earthquake prediction. Colleagues in Colorado and Washington speak highly of Haas. NSF is holding up decisions on current grant applications from Haas pending the outcome of the university's investigation.

At present Haas is in several kinds of trouble. The travel agent's tip led to a Federal Bureau of Investigation (FBI) inquiry and prosecution. In January, in U.S. District Court, Haas pleaded guilty to a misdemeanor charge for the misuse of federal funds in falsifying travel vouchers submitted to the university so that the Hong Kong trip of his associate, Madalyn Mary Parsons, would be paid for from his NSF grant. In exchange for the guilty plea, federal prosecutors agreed to drop other felony charges. Haas was sentenced to a \$1000 fine and a year's probation.

And in May 1977, when the story of the trip and the FBI investigation became known, the university chancellor recommended that Haas be dismissed. At present, its Faculty Privilege and Tenure Committee is investigating the university's charges against Haas, including double billing of numerous expenses, nepotism in the hiring of his sister and daughter, and "moral turpitude" for falsifying the Hong Kong trip vouchers.

Haas is the first professor at the university to fight a dismissal proceeding, according to campus spokesmen. Before the committee's hearing on 6 April, Haas maintained that he had planned to bill his NSF grant for Parsons' trip and pay the money back later. Indeed, Haas reimbursed the university \$3142 in March and April, after the FBI had interviewed Parsons. Any other mistakes he may have made, Haas testified, were "honest" ones. He also said the university had made errors in paying some bills twice. He testified that he had forgotten to pay back the university for the trip because of the strains on his marriage and pressure on him to write a 300-page report following the Hong Kong trip.

NSF began its audit of Haas's company—of which he and his wife make up the board of directors—in May, 1977, after the chancellor had recommended dismissal. A copy of the audit report, obtained by *Science*, shows that the company was charged for 70 percent of an apartment in Boulder where Parsons apparently lived. Haas's name also appeared on the mailbox, according to the audit report. NSF auditors disallowed \$1927 in expenses charged to the government from a trip Haas had taken with his family around the world in 1975; NSF disallowed another \$790 in travel expenses. The NSF was letting these overcharges run up against new expenses, officials say, when the work on the grants stopped last February due to the resignation of a key worker. More important than the specifics of the Haas case, however, is the fact that neither the NSF nor the university would normally audit all Haas's activities. His dual position as professor and company president put him out of step with the government's bookkeeping system.—D.S.

ported that several of their patients—who apparently had been smoking paraquat-laden marijuana—have experienced uncomfortable breathing and have been spitting up blood. Both the CDC and the doctors themselves are cautious about attributing the symptoms to paraquat, however, apparently because corroborating tests have not been devised.

Whether or not any poisoning has occurred thus far, users of marijuana appear to be increasingly aware of the potential risks. Charles Becker, a physician associated with the Haight-Asbury Free Clinic in San Francisco, told *Science* that the center has received hundreds of calls from smokers reporting adverse effects potentially related to the herbicide. Testing laboratories in Palo Alto, California, and North Miami, Florida, which guarantee anonymity for their clients, have been doing a brisk business in chromatography (contamination) tests of marijuana samples mailed in from all over the country. G. D. Searle, a pharmaceutical manufacturer, recently organized a testing program—the only free one—in Chicago, Illinois, and found that 39 of the first 40 samples tested were contaminated by paraquat. As the entire affair has received wider publication, the backlog of samples at each testing center has become substantial.

Meanwhile, officials in Washington have remained reluctant to express strong concern over the issue. No formal attempts have been made to seek Mexican cooperation in suspending the spraying. Lee Dogoloff, an official in the Office of Drug Abuse Policy in the White House, noted that "the government does feel some responsibility to smokers, but individuals do have some responsibility and choice in the matter—they don't have to smoke." Secretary of State Cyrus Vance, in a letter to Senator Charles Percy (R-Ill.), said that he personally shared Percy's concern about the problem and "will do everything possible to resolve it," but this seems to extend only to notifying the Mexicans of the health hazards and then waiting until a safe alternative to paraquat can be identified.

In a recent statement on the Senate floor, Percy—who has been following the issue closely—expressed his belief that more could be done. "To wait any length of time before [a safer herbicide] is identified—without in the interim doing anything to urge Mexico to suspend its current paraquat spraying program," Percy said, "could needlessly endanger a large segment of our population." Whichever side is correct will undoubtedly become clear as events continue to unfold.—R. JEFFREY SMITH