Briefing:

Study Estimates Higher Risk from Ethylene Oxide Exposure

A new government study suggests that exposure to ethylene oxide, a gas widely used by health care workers to sterilize medical supplies, may be more harmful than previously believed. The findings, based on animal tests, are likely to renew a regulatory debate among federal agencies about setting stricter exposure limits for workers. As many as 100,000 health care technicians may be exposed, according to government estimates.

Last year, the Occupational Safety and Health Administration (OSHA) issued a limit on ethylene oxide exposure, but critics say the agency didn't go far enough because it regulated exposure over an 8-hour day, not over a short period of time. Health care technicians are typically exposed to quick, concentrated bursts of the gas when the door of a sterilizing machine is opened.

The new study provides a basis for setting limits on short-term exposure, federal scientists say. The experiment was headed by Walderico Generoso at Oak Ridge National Laboratory and was sponsored by the National Institute for Environmental Health Sciences and the Department of Energy. The results are in press in *Environmental Mutagenesis*.

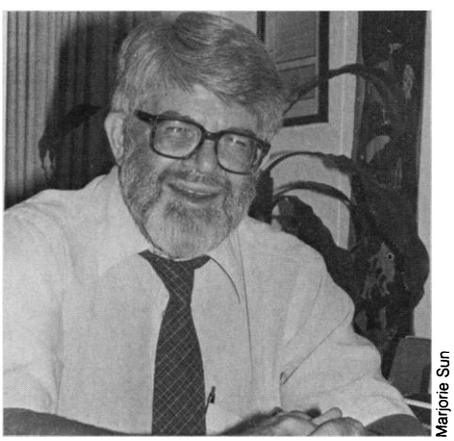
The experiment, which used 96 mice, showed that the animals suffer more genetic damage when they breathed bursts of ethylene oxide than when they were exposed to low concentrations over a longer period. The total dose was constant. Male mice were exposed to a total of 1800 parts per million (ppm) over 4 days, delivered at 300 ppm in 6 hours, 600 in 3 hours, or 1200 in 1.5 hours.

The researchers then used a standard method to determine if genetic damage occurred. The exposed males were mated with unexposed females. If chromosome breakage occurred in the male sperm, the animals' offspring would die.

The results were pronounced. Embryos bred from the males exposed briefly to the higher concentrations died more often than the embryos from the lowest exposure group. Three times as many embryos died from the 600-ppm group compared to the 300 ppm. Six times as many embryos died from the 1200 ppm group compared to the 300-ppm group.

Generoso and his colleagues caution that the exposure levels in the experiment were at much higher concentrations than workers normally encounter on the job. The current OSHA exposure limit is 1 ppm over 8 hours, which means a person could be exposed to 480 ppm for 1 minute. "[W]e cannot assume" that the extent of the effects seen in the experiment is also true for humans, the study says. Generoso said in an interview that solid epidemiological data are lacking. "That will be the real sticking point" for OSHA, he predicts. However, "In the absence of human data, you have to consider the possibility that the effects in animals might occur in humans. We should take the most conservative approach" to protect workers, he says.

Other federal scientists also find the results significant. Michael Shelby, a senior scientist at the National Institute of Environmental Health Sciences, says that "there is no question that [Generoso's study] shows a dose-rate effect." Shelby says that it



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J. Donald Millar

is "reasonable [to assume] that a similar effect could be seen in humans." The head of the National Institute for Occupational Safety and Health, Donald Millar, wrote to OSHA in late September that Generoso's data "strengthen our previous conviction" that a short-term limit should be established.

Patrick Tyson, the acting head of OSHA, said in an interview that he has not yet examined the study and has given priority to other regulatory issues. Recently, OSHA, under court order, proposed to tighten limits on worker exposure to formaldehyde and benzene and also announced it would require better medical surveillance of workers exposed to cotton dust.

Last year, the Public Citizen Litigation Group in Washington, DC, sued OSHA for failing to set stricter exposure levels, so Generoso's findings will likely be used by the group to strengthen its case. The first hearing was scheduled for 22 January in the U.S. Court of Appeals for the District of Columbia. ■ MARJORIE SUN

British Committee Rebuked Over Archaeology Congress

The location of the 11th World Archaeological Congress, due to be held in the United Kingdom this coming September, has been shifted instead to Mainz, Germany. The move is the result of a storm of protest that blew up in this country and in Europe when the British organizing committee decided late in their preparations to bar participation by anyone working in South Africa (*Science*, 22 November, p. 921; 20 December, p. 1359).

The International Union of Prehistoric and Protohistoric Science (IUPPS), under whose aegis the congresses are held, decided at a meeting held in Paris on 17 January that, in instituting the ban, the British committee had contravened its statutes. Specifically, the statutes lay down that congresses shall be open to scholars of all countries.

The international executive of the IUPPS therefore withdrew its official recognition of the planned British gathering, and accepted the offer by K. Bohner to host the congress in Frankfurt, also in September. Participants who have already accepted official involvement in the 11th congress will soon be informed of the change of venue and will be invited to switch their plans accordingly.

The decision came as something of a surprise to the British committee, which meets at the end of January to discuss its options. Peter Ucko, secretary of the committee, considers it unrealistic to reinvite the South African participants, not least because the issue has become highly charged politically in Britain. Canceling the British meeting will clearly have to be considered, but Ucko would prefer to continue with it, in spite of the competition from the official congress.

Ucko and his colleagues had applied the ban last fall, in the face of threats of civil disruption and withdrawal of financial support by a number of national and local organizations if South Africans were invited. This pragmatic decision was then cast as a moral stance, in line with the Association of University Teachers' complete boycott of cultural and academic exchanges with South Africa.

Opponents of the ban argued that protection of academic freedom was paramount, particularly in the case of South Africa. And a campaign to protest the ban has been gaining momentum in the weeks running up to the Paris meeting, with more than 250 participants having resigned from the congress. Half the resignations came from the United States. ■ ROGER LEWIN