

WOHRC NEWS

WOMEN'S OCCUPATIONAL HEALTH RESOURCE CENTER

OSHA Proposes New Ethylene Oxide Standard

Exposure would be lowered from 50 ppm to 1 ppm. "Significant risk" cited.

The U.S. Occupational Safety and Health Administration is proposing to lower its standard for exposure to ethylene oxide (EtO) from 50 ppm (parts per million parts of air) to 1 ppm.

The agency said it was acting because it had determined that "exposure to EtO at the present standard of 50 ppm clearly presents a significant risk of material impairment" to workers.

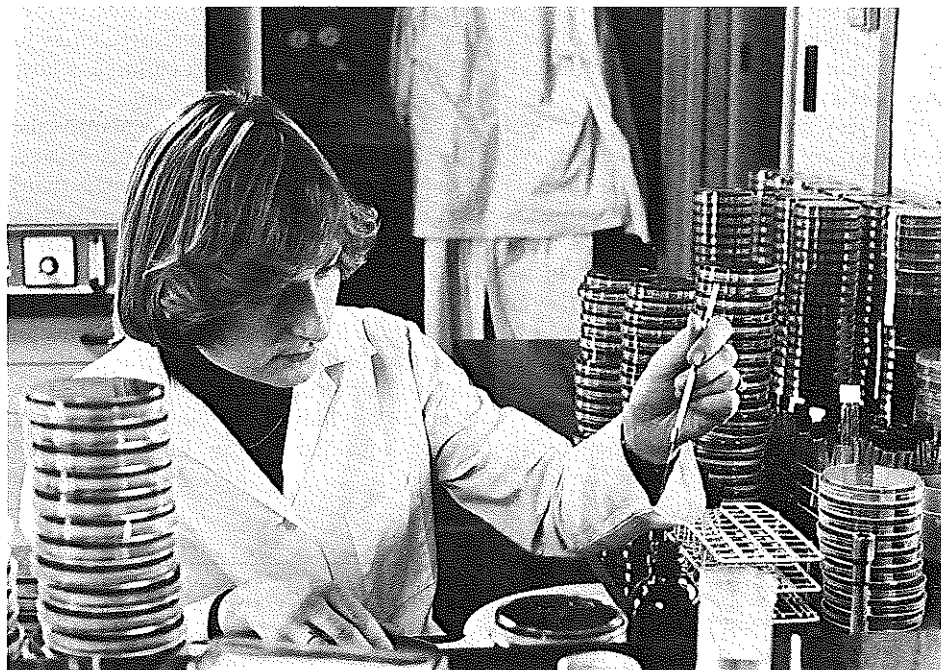
The chemical is widely used in a gaseous form to sterilize medical equipment and supplies in hospitals, clinical laboratories and dental clinics. Recent research has shown it to cause leukemia, tumors, sterility and malformed fetuses in laboratory animals, while in humans it has been associated with leukemia, diseases of the circulatory system, upper respiratory complaints and changes in DNA, which controls heredity.

The proposed new standard would provide for monitoring of employee exposure to EtO as well as engineering and work practice controls designed to lower exposure. The standard would also set rules for medical surveillance of workers handling the gas and procedures for training them to use it safely. Detailed record keeping of exposures would be required. Emergency procedures, such as the establishment of "regulated areas" with limited access, would be set up in cases where exposure rose above permissible levels.

Public hearings are scheduled for July 19 in Washington, D.C.

In discussing methods of compliance with the new standard, OSHA agreed with many health and safety experts that "engineering controls are the preferred means." These, it said, may include installation of local exhaust ventilation or modification of a process so as to reduce emis-

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Canadian National Film Board

Reproductive risks posed by substances in the workplace are discussed in a new report that summarizes current research and policy implications (page 5).

Government Regulation of VDT Use Urged

Occupational health specialists and labor unions urged government regulation of the use of video display terminals in hearings before two New York State legislative bodies in April.

Gwen Wells, research director of the Office and Professional Employees International Union, asked that employers be required to provide eye examinations and special VDT glasses when necessary. She also urged establishment of mandatory rest breaks of 15 minutes per hour or 30 minutes per two hours for VDT operators, with no operator spending more than five hours per day before a VDT.

Mark Chernoff, research director of the Communications Workers of America, urged similar rest breaks and called for regulations mandating that machines be adjustable for operator comfort and health.

Mary Sue Henifin, testifying for WOHRC, noted that studies of office worker health showed the need for regulations in addition to those governing VDT use. Attention must be paid, she said, to air quality, proper lighting and auditory and visual privacy, adjustability of machines and control of work.

The hearings were held before the New York State Assembly Standing Committee on Labor and the State Legislative Commission on Science and Technology.

Bills proposing regulation of VDT use have been introduced in five state legislatures since January of this year. Joel Shufro of the New York Committee on Occupational Safety and Health, who organized the hearings, said that there is "no question" that a similar bill will be brought before the New York State legislature this session. □

Vietnamese Present Evidence of Birth Defects Caused by Dioxin

Seven epidemiological studies by Vietnamese scientists have turned up evidence that herbicide spraying during the Vietnam War may have resulted in a marked increase in birth defects in Vietnamese children.

Results of the studies were presented to some 130 scientists from 20 countries at a conference held in Ho Chi Minh City last January. Although most of the foreign scientists present were reluctant to draw hard conclusions, several termed the evidence presented "impressive."

"It's very difficult to choose the right words to say how I feel about the evidence," Maureen Hatch, a Columbia University reproductive epidemiologist who attended the conference, told WOHRC. "There were certain problems with the study designs," she said, "but there was obviously an effort to use up-to-date and approved scientific methodology, and the work was carried out by people who had proper credentials."

"Nobody ever believes a single epidemiological study," she commented, "but these consistently showed an effect in the same direction. I would certainly say they are results which we should all incorporate into our consciousness."

The most striking of the seven studies was a survey of 40,000 North Vietnamese families in which the fathers had been

exposed to herbicides while fighting in the South. These showed a higher incidence of pregnancies resulting in stillbirths and deformities than families whose fathers had remained in the North where there was no spraying. An independent follow-up study, including some design elements that had been suggested by an American scientist, showed that children whose fathers had been exposed to the herbicides were three and a half times more likely to suffer birth defects than children whose fathers had not been exposed.

The abnormalities included neural tube defects, deformities of the sensory organs, deformities of the limbs, Siamese twins and cleft-lip. The same abnormalities were observed in children born in South Vietnam of mothers who had been exposed to herbicides.

"There seemed to be a big increase in anencephaly, the failure of the brain to close," observed Hatch. "These children would be stillborn, so that they were not even included in the follow-up study

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hazard. The risk increases still more if the animal is dissected, and the hazard to children and teacher alike is unthinkable should fingers accidentally be cut by sharp teeth, claws, or the teacher's exacto knife."

Zoonoses described

Diseases which can be passed from animals and birds to people are called "zoonoses," said Russell. "There are over 150 listed by the Center for Disease Control in Atlanta. One such disease is called lymphocytic choriomeningitis (LCM for short). It is particularly associated with hamsters and may affect gerbils as well. LCM is an acute central nervous system disease which can be followed by meningitis."

Handling dead animals, warned the Center, can also lead to tetanus, fleas, lice, mange, ringworm, staphylococcus, streptococcus, pigeon fever and rabies. "Rabies alone is enough reason to avoid dead animals. And it is frightening to note that rabies surveillance in this country is commonly done by checking road-killed animals" like those described in the article.

WOHRC has also issued warnings about hazards to teachers and students by classroom experiments. In a recently published "Safety Checklist for School Science Labs," this organization discussed toxic chemicals that are often handled in the classroom without proper safety provisions. A WOHRC survey has also found that many school laboratory accidents, such as burns and cuts, could be avoided by better safety practices.

For a copy of the checklist, which also contains a list of chemicals that are suspected carcinogens and teratogens, send 50 cents to WOHRC, School of Public Health, Columbia University, 60 Haven Avenue, B-1, New York, New York 10032. □

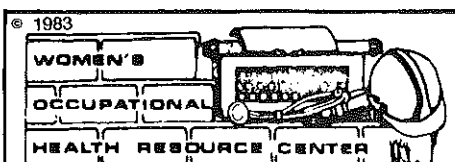
Animal Experiments Can Be Dangerous, Teachers Warned

The Center for Occupational Hazards has issued a sharp warning about a school project described in a recent issue of a popular national teacher's magazine.

In an article written by a New England kindergarten teacher, says the Center, there is a description of "how she and her students dissected the class pet gerbil who died suddenly of unknown causes. This experience led her to dismember other dead animals which she and her students found about. Among them were a 'still warm' ground hog, a mouse, several opossum and some birds."

The Center pointed out that a project like this is extremely dangerous for both teachers and students. "The primary hazard," said COH's Monona Russell, "is, of course, exposure to diseases, parasites and infections.

"Many diseases and parasites can be transmitted simply by touching dead animals," emphasized Russell. "The more prolonged the contact, the greater is the



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(Subscription information on page 6.)

WOHRC NEWS in Guide

WOHRC NEWS is among the publications listed in the new *Annotated Guide to Women's Periodicals in the U.S. and Canada*. This is the third edition of the Guide which features over 250 publications. Each is briefly reviewed by category and indexed both alphabetically and by state.

To order the Guide, send \$6.50 per copy or \$12 for a one-year subscription to T. Mehlman, 5173 Turner Road, Richmond, Indiana 47374.

WOHRC FACT SHEET

WOMEN'S OCCUPATIONAL HEALTH RESOURCE CENTER



Handling Chemotherapeutic Drugs

Drugs for treatment of cancer have been used so widely in recent years that concern is growing over the health hazards they may pose to the health care workers who handle them. The very chemical properties that make antineoplastic drugs effective weapons against cancer — their ability to interfere with the cellular replication of rapidly dividing cancer cells — may also make these drugs hazardous to workers who are exposed to them. These workers include not only nurses, who mix and administer most of the drugs, but doctors, pharmacists and the main-

tenance workers who clean up after all are finished.

Research on these hazards is still incomplete, but one study showed increased mutagenic activity in the urine of nurses who handled cancer chemotherapeutic agents. This is of concern because mutagens change the cellular DNA that controls cell division and heredity. Many mutagens also cause cancer. There are other, anecdotal reports of lightheadedness, dizziness, facial flushing and nausea by nurses and pharmacists who were unprotected while preparing the drugs.

A recent survey by the Women's Occupational Health Resource Center and the Comprehensive Cancer Center at Columbia University of two large teaching hospitals and three affiliated community hospitals found marked inconsistency in policies and procedures for safely handling cancer chemotherapeutic drugs. Practices varied not only from hospital to hospital, but even within the same institution and among individual practitioners. In some hospitals there were no safety policies at all. In others, even when safeguards were available, they often were not employed.

Who is at risk

In most hospitals, chemotherapeutic drugs are mixed and administered by nurses. Pharmacists and physicians — mainly residents and fellows rather than attending physicians — handle them to a lesser degree. Whereas pharmacists in this study tended to dispense all the cancer drugs at a single time of day, nurses are likely to use them at their stations throughout the day, depending on their arrival from the pharmacy and on the times prescribed for the patients. Individual nurses usually mix and administer between two and twenty doses per day.

Thus, although the risk to individual workers from handling the drugs a few times may be small, the fact that so few people handle them so frequently intensifies the potential hazards and makes safety practices all the more necessary and important.



Barbara Aufero

A preferred safeguard in mixing chemotherapeutic drugs is a vertical laminar flow hood like this one.

Physical facilities

In the hospitals surveyed, 80 percent of the drugs were prepared under a laminar flow hood, which is the preferred method for shielding workers from contaminants. Three percent of the drugs were prepared under a horizontal flow hood, which is less effective, and 17 percent were mixed without any hood at all.

Even if hoods are used, however, they may not be sufficient protection. Those observed by the survey team all used HEPA (high efficiency particulate air) filters whose efficacy has not been tested specifically for chemotherapeutic drugs.

In no instance did the surveyers find a charcoal or other filter designed to chemically scrub the air.

The placement of the hoods also tended to reduce their efficiency. Most were installed in small rooms with high traffic where the movement of workers would interfere with the flow of ventilating air. Industrial hygiene data show that this kind of installation, in addition to the movement of the worker's arms within the hood, can decrease protection. In fact, unless the hoods are carefully installed, maintained and used, they may exacerbate rather than prevent exposure. This is especially so if hood blowers are not adjusted to make sure that no contaminated air blows back into the worker's face or into the workroom.

Several of the procedures used also increased risk of exposure to the drugs through the skin as well as the respiratory tract. In the survey, 49 percent of the drugs were purchased in ampules that had to be broken before use. This procedure has been experimentally shown to leave particles in the air even when it is performed under a hood. Other leaks can come from syringes, tubing and stopcock connections and the expelling of air from an infusion line.

Personal protective equipment

Seventy-five percent of those surveyed used gloves while mixing drugs, but none of the nurses continued to wear the gloves when administering the drugs to patients. No one used a chemical fume mask during either mixing or administering the

drugs.

Similarly, routine wearing of laboratory coats varied. Only about a third of the physicians wore them. Most of the nurses considered their uniforms to be their lab coats, with fewer than 25 percent wearing additional protection. All of the nurses wore their uniforms home. There were no laundry facilities available for nurses' uniforms.

None of the housekeeping staff members who disposed of contaminated trash were seen wearing protective clothing.

Training

Although several of the institutions surveyed had extensive training programs centered on patients' reactions to the drugs, none provided basic training in safety for the hospital personnel. None demonstrated safe practices for either mixing or administering chemotherapeutic agents. Nurses, because they received information about toxic effects of drugs on patients, may have been somewhat aware of the hazards to themselves. However, in no case were nonprofessional staff provided with information, training or guidance to indicate that there might be danger, or that certain work practices might reduce their exposure.

Disposal techniques

The survey found many unsafe practices in the disposal of contaminated equipment and trash. In some of the preparation areas, the leavings from chemotherapeutic procedures were not separated from other trash. In 60 percent of these areas survey personnel found needle destructor clippers, a disposal device that clips needles from syringes containing drugs. No special precautions were taken when the needles broke. In all cases, I.V. bottles were dumped with the regular refuse.

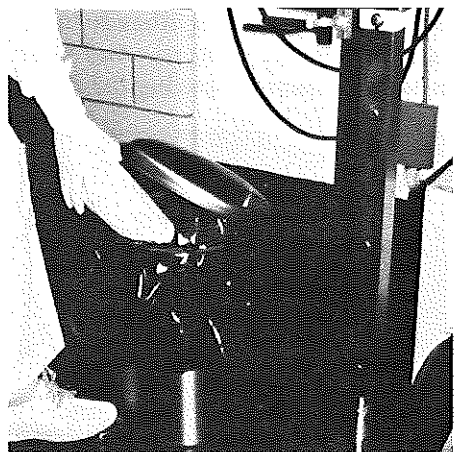
The hospital with the best practices had all drug-contaminated equipment except I.V. bottles packaged into ziplock bags and delivered to the pharmacy for incineration. But even here, as in all others surveyed, no special arrangements were made for the collection and disposal of patient excreta or regurgitation. Personnel who handled it took no special precautions and wore no special protective equipment.

This is particularly dangerous since drugs are often not entirely absorbed by the body, and trace amounts can be expected in the excreta and regurgitation of cancer patients who have been treated with chemotherapeutic drugs.

An additional warning

This survey, it should be noted, concentrated only on university medical centers and community hospitals. Private doctors' offices and private practice pavilions within institutions were not examined. However, it is likely that potential exposure in these areas is even greater, since few are equipped with hoods and personal protective equipment, or practice protective disposal techniques.

It is also important to note that some of the substances used in chemotherapeutic drugs, such as alkylating agents, interact directly with DNA, the material that controls cell replication and heredity. It is generally accepted by the toxicological community that exposure to these drugs should be avoided as far as possible.



Barbara Aufiero

Drug-contaminated trash should be kept separate from other trash and disposed of in covered receptacles with removable linings.

What can be done

More data is still needed for a decision on the best kind of hoods. But there are immediate steps that can be taken for the protection of personnel handling these drugs. Scandinavian research has already indicated lower mutagenic activity in the urine of hospital staff members who observe proper industrial hygiene.

The following checklist indicates some of the protective procedures already available:

- Are all personnel who handle chemotherapeutic drugs and the trash resulting from their use wearing long sleeved protective clothing, such as a lab coat, while performing these duties?
- Are they also wearing disposable gloves?
- When intravenous pushes or infu-

sions are being injected, or when a syringe is being cleared of air bubbles, is cotton gauze wrapped around the needle and I.V. tubing to prevent particles escaping into the room?

- In disposing of patient wastes, are disposable urinals with tight-fitting caps used? (See American Hospital Supply catalog #13592, 13593, 13595.)
- Are wastes from regurgitation collected in boxes lined with disposable trash lining?
- Are syringes, unclipped needles, vials, gloves and the like discarded in a specially designated waste container that is covered and remains separate from the general trash?
- Are uniforms and reusable isolation gowns kept separate from the regular laundry?
- Are mixing procedures carried out in a hood demonstrated to give operator protection? (Horizontal hoods do not suffice.)
- Before and after mixing drugs, is the hood and whole mixing area wiped down thoroughly with a detergent-based solution?
- In vertical hoods, are surfaces under the air grills wiped thoroughly at least once every two weeks?
- Is the hood inspected routinely by the hood contractor?

This fact sheet is based on research by Jeanne Stellman, Ph.D.; Barbara Aufiero, MPH; and Robert Taub, M.D., Ph.D., presented at the American Society for Preventive Oncology, March 26, 1982.

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Plight of Thai Workers Described by Doctor



Thai women working in a factory

The recent industrialization of Thailand has been accompanied by much pain and suffering on the part of its workers, according to a report recently received from a Thai occupational health specialist.

In an unusually moving paper, Dr. Malinee Wongpanich, chairman of the occupational health department at Mahidol University, Bangkok, describes women workers who have been temporarily driven insane and permanently crippled by manganese poisoning contracted in a factory manufacturing dry cell batteries. Others, in a blanket factory, are found "gasping for breath" from bysinnosis. "They cannot lie down nor sit comfortably, but swing their bodies, their mouths wide open for want of air."

Fingers routinely lost

Young workers, both men and women, routinely lose fingers and sometimes whole arms by using machines without proper safeguards, reports Dr. Wongpanich. Although both sexes suffer in the new economy, women, who are less mobile and have fewer job opportunities, are especially burdened by the lack of health and welfare services. In the textile industry, young women coming from the countryside frequently live in dormitories provided by the mill. A 1981 study, says Dr. Wongpanich, found more than half of these dormitories housing eight or more employees per room, without clean drink-

ing water or adequate toilet facilities. Sometimes there are three eight-hour shifts, so that three women working different shifts all use the same mattress pad.

Dr. Wongpanich blames such conditions on employers with no social conscience, civil servants who fail to enforce health and safety laws and fellow physicians, many of whom have little interest in occupational health. She notes, however, that these sins are not peculiarly Thai; similar conditions prevail in other newly industrialized countries in Southeast Asia, particularly those with little urbanization, a low standard of living and a large and unsophisticated pool of labor coming into the cities from the countryside. Workers in Western Europe, and immigrants to the United States suffered similarly when those areas were first undergoing industrialization, she comments.

Hope for Thai workers, says Dr. Wongpanich, lies in the trade union movement and in foreign concerns who set up factories in partnership with Thai businessmen. Several, particularly the Japanese, have high standards for worker health and welfare which they have introduced into Thailand, she reports. □

Conference on Women And Work Held in Turin

Some 400 delegates were expected to attend an international conference on women and work held in Turin, Italy, April 23-25.

The conference was organized by three Italian feminist groups, the Women's Trade Union Caucus, the Italian Women's Union and the groups and collectives of the Women's Building in Turin.

Main purpose of the meeting, according to the organizers, was to bring together the two "souls" of the women's movement — the struggle for equality and the recognition of differences — as they involve women in the workplace. Sessions and workshops were planned on trends in the workplace, the trade unions, the family, social services and culture. Some of the questions raised in the prospectus were: Is the growing number of women in the labor market an irreversible phenomenon, or will it be halted by the rise in unemployment? Can we define a "sexual-sexist" use of technological innovations; can new technologies be used by women to improve individual and social lives? Can shorter working hours and a different

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BOOKS

Reproductive Hazards at Work: Men, Women and the Fertility Gamble, by Nancy Miller Chenier. 104 pp. Canadian Advisory Council on the Status of Women. December 1982.

by Barbara Aufiero

Evidence from research studies continues to mount, adding to the list of substances known or suspected of causing serious reproductive problems. Miscarriages, birth defects, loss of sexual drive, menstrual irregularities and low sperm count have been linked with such factors as lead, radiation, anesthetic gases, vinyl chloride and pesticides. Yet all are commonly found in the workplace. What kind of policies are needed to prevent or limit worker exposure? What kind of tests can be developed to ensure against the introduction of new hazards?

This valuable report effectively summarizes what is presently known about the research efforts, social and policy implications and economic concerns surrounding this complex subject. Every aspect of the issue is addressed, if only to indicate the scarcity of information.

Chenier begins with a basic, overall definition of reproductive health, proceeds with an in-depth discussion of the emergence of protective workplace policies and concludes by recommending measures that may provide solutions. Well-documented case histories are given of occupational groups, such as health care workers exposed to anesthetic gases who have suffered from exposure. A complete inventory of chemical, biological, physical and psychosocial workplace hazards affecting reproduction is included. A particularly notable contribution is a concise summary of activities and policies undertaken in other countries to ensure reproductive health for workers.

Copies of the report are free and may be ordered from the Canadian Advisory Council on the Status of Women, 66 Slater Street, 18th floor, Box 1451, Station B, Ottawa, Canada K1P 5R5.

This material has been funded in whole or in part with Federal funds from the Occupational Safety and Health Administration, U.S. Department of Labor, under grant number USDLE9F3D375. These materials do not necessarily reflect the views or policies of the U.S. Department of Labor, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

EtO continued from page 1

sion of the contaminant into the workplace. Work practice controls, said the agency, are another preferred method, and may include substitution of another sterilizing substance for EtO.

The use of respirators was considered "least satisfactory," and would be approved, said the announcement, only when it could be shown that they had been appropriately selected, fitted, worn and maintained.

Plans must be written.

Each employer would be required to develop a written plan for engineering and work practice controls and to update it annually.

The provision for monitoring worker exposure would require the employer to measure the exposure of a representative sample of employees, including the one "reasonably expected to have the highest exposure." Each employer would have to institute a medical surveillance program for all employees exposed to more than .5 ppm of the chemical for at least 30 days per year. The surveillance program would include comprehensive medical and work histories, a complete physical examination, a blood count and screening for chromosome damage.

In the proposed regulated areas, where exposure might be higher than permissible, signs would be required, reading: "Danger. Cancer and Reproductive Hazard. Authorized personnel only. Respirators and protective clothing may be required to be worn in this area."

The new OSHA proposal on ethylene oxide was published in the Federal Register on April 19 after several years of urg-

ing by scientists, scientific organizations, state health authorities and labor unions whose members work with the chemical. Earlier this year, the agency was ordered by a U.S. District Court judge to stop what he termed its "unreasonable" delay in establishing a new and stricter standard.

In its announcement, OSHA asserted that the risk posed by EtO "has already been informally acknowledged by industry which has already reacted to the developing information regarding the potential health effects of EtO by voluntarily reducing exposure to employees."

Those who wish to appear at the public hearings are advised to write by June 17 to Tom Hall, OSHA Division of Consumer Affairs, Docket No. H-200, Room N-3635, U.S. Department of Labor, 3rd Street and Constitution Avenue NW, Washington, D.C. 20210 (202-523-8024). Written comments may be sent to Docket Officer at the same docket number and address, Room S-6212. □

Vietnam continued from page 2

which was based on surviving children with birth defects." If they had been included, she suggested, there would have been "an even stronger association between herbicides and birth defects."

Another interesting result reported, said Hatch, was "a substantial increase in an entity called molar pregnancy. This is actually a conception that lacks an embryo," she explained. "You get something that looks like a cluster of grapes, which is doomed, of course. But the lesion that it leaves behind, or some facet of this pregnancy, predisposes a woman to a form of cancer at a later date."

Three aspects of the studies disturbed foreign scientists most, according to Hatch. One was a failure in some to take into account maternal age, which can influence the rate of birth defects. Another was the fact that the rate of defects in the control, or unexposed group, was unusually low when compared to world base-line data. The third was that paternal transmission of birth defects is a relatively new idea which has not yet been proved for herbicide exposure.

Some 72 million liters of herbicides and defoliants were dumped on South Vietnam between 1961 and 1971 in an effort to clear away vegetation to expose fighting. The most widely used herbicide was Agent Orange, which contains dioxin, a long-lived contaminant which has been shown in animal studies to be a potent cause of cancer, mutations and abnormalities in fetuses.

American veterans of the Vietnam war have been seeking U.S. government compensation because, they claim, their children too have suffered birth defects from paternal exposure to Agent Orange. □

Turin continued from page 5

work schedule provide an answer to unemployment problems as well as affecting equality at work and responding to the need for a better quality of life?

Noting that similar changes have been taking place in the lives of women in many industrialized countries, the organizers looked forward to setting up a permanent channel of communication.

Further reports on the discussions will be published as they are received here. □

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