

# WOHRC NEWS

WOMEN'S OCCUPATIONAL HEALTH RESOURCE CENTER  
SCHOOL OF PUBLIC HEALTH  
COLUMBIA UNIVERSITY

## Back to School in Safety

### Caution in Science Classes

Each year, the "Back to School" rite of Fall means that the nation's science teachers and their students might be dealing once again with a list of hazards in the form of possible explosives, carcinogens, highly toxic and/or corrosive or irritant chemicals. This year, however, with technical support from the U.S. Consumer Product Safety Commission and NIOSH, the Council of State Science Supervisors has prepared a new guide to recognizing and controlling such hazards in school science labs.

Noting that only qualified professionals should be assigned to teach science courses, the guide states that "some level of risk is inherent in almost all science activities..." Nonetheless, "the potential

hazards of certain substances outweigh their usefulness. In some cases, hazardous substances come into the schools through governmental surplus property, industrial and college 'give-aways,' or special purchases for student projects. Often a hazardous reagent has been stored in quantities for a long period of time with only the antique packaging serving as a clue to its age."

In addition to providing lists of potentially hazardous chemicals, the guide includes information to enable teachers to store chemicals according to "compatible families," thus eliminating the hazards of unsafe storage.

*continued on page 2*

### Cancer Drug Work Poses Many Risks

Two studies relevant to pharmacists, nurses, physicians and others who mix and administer cancer chemotherapeutic agents have recently been published. Swedish researchers have reported finding significantly increased levels of chromosomal aberrations among nurses with long-term exposure to such agents when compared to laboratory workers and clerks with no similar exposure. A second study shows that latex and polyvinyl chloride gloves offer only limited protection against contact to carmustine, one kind of drug.

In recent years researchers have linked the handling of cancer drugs with mutagenic and physical effects such as liver damage. There have also been anecdotal reports of nausea, lightheadedness, dizziness and facial flushing. However, no data are available on whether there is a long-term risk from occupational exposure. The new study on chromosomal aberrations, by Nikula and co-workers and published in the "Scandinavian Journal of Work, Environment and Health," is the first in which persistent chromosomal changes which may be related to the drug exposure have been reported. Previous work by others has

found a reversal of damage after precautionary measures to limit exposure were taken.

The permeability of commonly used glove materials to carmustine, (Connor and co-workers) reported in the "American Journal of Hospital Pharmacy" is particularly relevant because most experts have recommended the use of surgical gloves as one important means of protection against exposure to the drugs. These researchers found that permeability occurred within five minutes and continued to increase with time. The authors warn that their study only tested one drug but that the possibility of glove permeability must be kept in mind when handling all drugs.

A comprehensive review of the "state-of-the-art" of knowledge about cancer chemotherapeutic agents as potential occupational health hazards is now available from WOHRC. There is a charge of \$5.95, plus \$1.00 for shipping and handling. Information on "ChemoTest" WOHRC's innovative monitoring system for assessing the spread of materials during simulated working conditions is also available upon request. □

## •• News Briefs ••

• IN A SURPRISE move, the Administration has chosen Robert A. Rowland, chairman of the Occupational Safety & Health Review Commission, to fill the post vacated by Thorne G. Aucter as chief of OSHA. It was expected that a new OSHA head would not be named before the Presidential election. Rowland, an attorney in Austin, Texas, was vice chairman of President Reagan's 1980 campaign in his state.

• A MAJOR international scientific conference on work with VDTs will be held in Stockholm, May 12-15 1986. Prior to the conference, three bulletins with summaries of the issues to be discussed will be issued. The conference will cover occupational health, technical hygiene; image quality and vision; ergonomics; work organization and human-computer interaction. WOHRC Director, Dr. Jeanne Stellman is American Co-Coordinator of the conference which is being organized by the Swedish National Board of Occupational Safety and Health Dept. IBM is one of the major sponsors.

• ACCORDING TO a July "Occupational Health & Safety Letter," the U.S. District Court in Washington D.C. has told OSHA to reconsider its decision to deny an emergency temporary standard for formaldehyde exposure as well as its decision not to institute rulemaking proceedings for a permanent standard. "This is a case where a number of factors point to reconsideration by the agency," the court noted.

• PREVENTION of Hepatitis B; The Pregnant Hospital Employee; Environmental Surveillance in the Hospital and an article on chemical hazards by WOHRC Director Dr. Jeanne Stellman, are among the topics in "Highlights of the Medical Center Employee Health Conference," gleaned from the 68th Annual Meeting of the American Occupational Medical Association. Copies are available for \$1.00 postage and handling from WOHRC. □

## PUBLICATIONS

**Caution: Your Work May Be Hazardous to Your Health, National Commission on Working Women, 2000 P St., NW, Suite 508, Washington D.C. 20036, \$10.**

This new report issued by the National Commission on Working Women calls attention to a vital—and far too often neglected—area.

**Women in the Global Factory, Annette Fuentes & Barbara Ehrenreich, Institute for New Communications, N.Y., N.Y., South End Press, Boston, \$3.75.**

What's a multinational corporation like Sears Roebuck or General Electric doing in a Third World country like the Phillipines or Guatemala? In "Women in the Global Factory," Annette Fuentes and Barbara Ehrenreich provide one analysis: money. The U.S. minimum wage is \$3.35 an hour. In the Third World, the average wage is \$3 a day.

Ninety percent of these workers are women. According to Fuentes and Ehrenreich, Third World women are valued for the manual dexterity and patience required by work in electronics plants or toy and clothing factories and are usually anxious to keep their jobs. Many think it prestigious to work for an American company.

But, as Fuentes and Ehrenreich note that conditions are often oppressive.

Among the occupational health hazards the authors list are chronic back problems, asthma, brown lung disease, liver, kidney and bladder problems. The illness problems are highest in the electronics industry where there are possible links to cancer because of exposure to solvents.

Third World workers must also contend with sexual harassment. A Mattel worker in the Phillipines said, "we call our company 'motel,' because we are often told to lay down or be laid off."

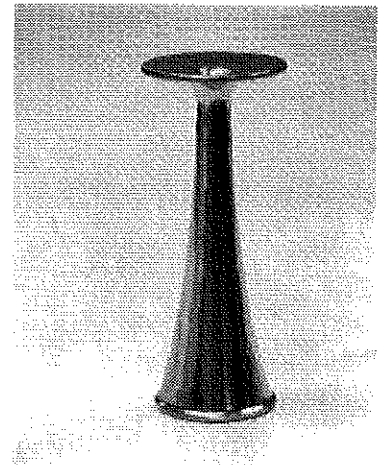
—Amalia Pretel

**A Job Safety & Health Bill of Rights, Rick Engler, Philadelphia Area Project on Occupational Safety and Health (PHILAPOSH) 1984. PHILAPOSH, 3001 Walnut St., 5th Floor, Phila. Pa., 19104. \$3; \$2 on orders of 5 copies or more.**

A concise guide aimed at providing insight to trade unionists and health and safety activists written by a activist "pioneer" from pre-OSHA days.

The author's viewpoint and ideas are outspoken and will be bound to awaken thought and reaction from everyone who reads this. □

## LOOK FAMILIAR?



The fetalscope shown in use and in detail above, is a "time-honored" instrument used to check the fetal heart. The user, however, must assume an uncomfortable position repeatedly when she bends over and places her ear on the scope. Having received a complaint about physical effects from long-term use, WOHRC is seeking information about where the fetalscope is still in use to investigate possible ill effects that might not have been traced to the instrument.

### GUIDE continued from page 1

According to the guide, "the decision to use certain substances in the school laboratory should be based on the best available knowledge of each chemical's particular hazard and the availability of proper handling facilities. Substitutions either of chemicals or experiments, often can be made to reduce hazards without sacrificing instructional objectives. When the risk outweighs the benefit and no substitute chemical is available, then the experiment should be eliminated."

There are guidelines on safe work practices as well, such as:

- Never work alone in a science laboratory or storage area;
- Never eat, drink, smoke, chew gum or tobacco in a science laboratory or storage area.
- Never pipette by mouth.
- Restrain loose clothing;
- Tape all Dewar flasks;
- Never leave heat sources unattended;
- Never place reactive chemicals near the edges of a lab bench;
- Use a fume hood when working with volatile substances;
- Obtain and read the Material Safety Data Sheets (MSDS) for each chemical before beginning any experiment.
- Analyze new lab procedures in advance to pinpoint hazardous areas;
- Always inform co-workers of plans to carry out hazardous work.
- Conduct regular in-house safety and health inspections.

- Gloves should be worn which will resist penetration by the chemical being handled and which have been checked for pin holes, tears, or rips.
- Wear a laboratory coat or apron to protect skin and clothing from chemicals.
- Footwear should cover feet completely; no open-toe shoes.

An attractive "Science Laboratory Safety Poster" is available from WOHRC for \$1 including postage and handling.

© 1984



### WOHRC STAFF

Barbara Aufiero, MPH  
Eugenia Donahue  
Mary Sue Henifin, MPH  
Susan Klitzman, MPH  
Amalia Pretel  
Amy Rosenberg, MPH  
Barry Snow, Ph D  
Katherine Warren

**Executive Director**  
Jeanne M. Stellman, Ph D

**Editor**  
Susan S. Lichtendorf

(Subscription information on page 6)

# WOHRC FACT SHEET



WOMEN'S OCCUPATIONAL HEALTH RESOURCE CENTER

## THE HEALTH RISKS OF DENTISTRY

Dentists, dental assistants and dental hygienists constitute a sizable occupational group at risk to multiple exposure to harmful agents—chemical, physical and biological. Job stress also is part of the picture. While the risk factor in the dental professions is not usually life-threatening, health can be damaged. In general, dental

education has not adequately prepared dentists and dental personnel to recognize and avoid many of the hazards in their work environment. Fortunately, in the past decade, attention has been called to the problem both in scientific circles and in media reports. This raised level of awareness plus strategies for limiting exposure can make a difference.

There are some 125,000 dentists practicing in the U.S. and over 93% of these employ at least one other person, with one third employing four or more auxiliary persons. Reports concerning the health and safety of dentists have appeared in the scientific literature since the 1920's. While mortality studies have shown that dentists have a better mortality experience than the general population and a lower mortality rate than their professional peers, it would be a mistake to dismiss the health risks in dentistry. The reality is that dental personnel are at risk for exposure to infectious diseases, chemical and radiation hazards and the design of the dental workplace can promote physical strain. The stress of being in a service profession also can have a harmful impact.

### IDENTIFYING THE RISKS

#### Infections

During high speed operative procedures dental personnel can be exposed to microbial aerosols consisting of infected dental pulp and water droplets contaminated with organisms from the patient's saliva. Even in procedures removed from the patient, there can be risk. For example after an outbreak of *Mycoplasma pneumoniae* infection among prosthodontic laboratory personnel an investigation revealed that the organism was transmitted by fine-particle aerosol generation from abrasive grinding of contaminated dentures.

Dental personnel are at particular risk from primary herpes infection because of frequent exposure. Herpes simplex virus (HSV) is responsible for a variety of clinical syndromes affecting the skin, mucous membranes and nervous system. Dental personnel are at risk of herpetic lesions particularly of the eye and finger. Transmission can occur by contact with the saliva or an active lesion. Furthermore, a study done at the University of Michigan has shown that dentists and



dental students who had no evidence of HSV disease were more vulnerable to the Herpes virus than the general adult population when they were treating patients with active lesions.

Hepatitis, an acute illness that can mean a four-to-six week absence from work, is a particular risk for dental personnel because the disease is so common that it is not unusual for a patient to be a silent carrier. According to one expert, thirteen percent of practicing general dentists contract Hepatitis B compared with four percent of the general population. When dentists become infected they become carriers themselves, an additional danger to the public.

#### Chemical Exposure

There are a myriad of potentially hazardous chemicals in the dental environment several of which are worth specific mention:

#### Waste Anesthetic Gases

NIOSH estimates that each year some 100,000 dentists and dental assistants are exposed to waste anesthetic gases that include nitrous oxide, halothane, enflurane and others. Exposure to these gases occurs primarily from leakage of gases from the anesthetic system, poor fit of masks on patients and such sloppy work practices as turning on the equipment before the patient is properly masked. Reported risks from waste gas exposure include: impaired perceptual cognitive and motor skills; liver disease and cancer. Wives of dentists exposed to these gases have a higher rate of spontaneous abortion and, there have been reports of a slightly higher rate of birth defects.

#### Airborne Particulates (Mineral Dusts)

High speed grinding of silica-containing composite restoratives, the contouring of fused porcelain and other such procedures create airborne mineral dust, a situation

similar to the risk of dust disease linked to asbestos exposure. Additionally asbestos itself has been used as a binder in periodontal dressing and as a lining material for casting rings and crucibles. The Council on Dental Therapeutics no longer considers such products acceptable.

### **Methyl Methacrylate**

Methyl methacrylate is widely used in dentistry as an adhesive. While there is limited data on the effects of prolonged exposure in humans, the monomer component of this chemical is known to be an irritant to the eyes, mucous membranes and skin.

### **Ethylene Oxide**

Ethylene oxide is becoming more common as a component of the sterilization processes that are a must in a dental office. Excess quantities of the chemical can be released during routine use of ethylene oxide, a potent cancer-causing agent. In addition, ethylene oxide can cause gastric, skin and eye effects. And, animal studies and preliminary human studies have shown an adverse effect on reproduction.

### **Beryllium**

Beryllium is a highly toxic metal which is used in dental alloys. Melting, grinding, buffing and general lathing operations in the preparation of dentures can result in significant exposure. Acute chemical pneumonitis, pulmonary granulomatosis, dermatitis and skin ulcers have been linked to occupational exposure.

### **Mercury**

There is a vast literature on mercury contamination in the dental office through contact or handling of mercury and mercury-containing compounds as well as inhalation of vapors and respirable dusts. Mercury can cause nerve and liver damage among other effects and can be stored in body tissues for many years.

### **Physical Agents**

Exposure to ionizing radiation is one of the best-known occupational hazards. Nonetheless, a study done as late as 1969 in England found more than one-third of the dentists studied still holding x-ray films in their patients mouths fairly regularly. Concern for radiation exposure requires constant vigilance of the operating procedures and equipment (see guidelines below) and a healthy respect for the cumulative effect of low-level exposure over time.

The use of devises for curing resins and sealants, plaque lights and molten metal used in casting can result in eye irritation,

erythema of skin and/or mucous membranes and malignant transformation of cells and viruses.

### **Miscellaneous Hazards**

In addition to the above chemical and physical agents of harm, those in dentistry are subject to high noise levels from drills, contact dermatitis from the constant use of soaps and detergent—office personnel usually wash their hands some fifteen times a day—and disorders of the musculo-skeletal system from poor working position. Moreover, dental practice means dealing with patient anxiety, high case loads, physical confinement during the working day and such intangibles as frustrations in reaching treatment goals because patient cost objections. These intangibles can add up to job stress overload.

### **LOOKING FOR SOLUTIONS**

Although there are a myriad of potential hazards in dentistry, they can be controlled. The following suggestions and questions a dental professional should ask were compiled by Dr. Jacqueline Messite, NIOSH Regional Program Consultant and WOHRC Director, Dr. Jeanne Stellman as a guide to controlling unnecessary hazardous exposure in necessary work.

#### **Chemical Control**

For each of the chemical processes or products used, the following should be considered:

- Do you know the generic name and potential toxic effects of each chemical ingredient?
- Have you obtained material safety data sheets from the manufacturer?
- Are all employees aware of proper handling practices and precautions?
- Are in-service training sessions carried out at least annually?
- Are you and your employees aware of signs and symptoms of inadvertent exposure?
- Are records kept of the dates, quantities, and names of all chemicals used?

#### **Infection Control**

- Do you take a complete health history of your patients, with an update each visit?
- Do you use a rubber dam to limit the spread of aerosolized saliva?
- Do you use surgical gloves to stop infections from entering abraded or nicked skin?
- Do you wear a face mask while working on the patient?
- Do you buy handpieces and air-water syringes (that can be heat sterilized?)

- Are all dental instruments routinely and regularly sterilized?
- Are disposable syringes and needles used and disposed of in closed containers?
- Do you routinely have your patient rinse his/her mouth prior to beginning the session?
- Are all uniforms and work clothes removed at work and laundered professionally to avoid contaminating home environments?

#### **Radiation**

- Are you fully aware of the latest techniques and requirements for the safe use of radiation?
- Are only films rated Speed Group "D" or faster used?
- Is the x-ray beam filtered to eliminate unnecessary wavelengths and to meet state and federal requirements? Do you minimize both the time and amperage needed to achieve effective results?
- Do you provide patients with a leaded apron?
- Do you always avoid holding the film in place for a patient and use x-ray holders or other methods instead?
- Is your examination area arranged to permit you to stand at least 6 feet from the patient and outside the path of the beam when the equipment is operating?
- If your workload is greater than 30 mamp per week, do you have an adequately screened and shielded area?
- Do you have your office inspected periodically by state officials or other qualified experts to ensure that all equipment and shielding are effectively maintained? (Have you considered personal dosimeter measurements for you and your staff to assure control?) □

---

The information in this fact sheet was excerpted from "Occupational Hazards in Dentistry," Harriet S. Goldman, Kenton S. Hartman, Jacqueline Messite, Year Book Publishers, 1984 Chicago, 1984. Available from WOHRC for \$ 29.95 plus \$2 postage.

---

**For permission to reprint this fact sheet, information about bulk orders, or any other information on this topic, write to:**

© 1984

**Women's Occupational Health  
Resource Center  
School of Public Health  
Columbia University  
21 Audubon Ave., 3rd Floor  
New York, New York 10032**

## Status of Right of Know Legislation

Since 1980, persistent lobbying by community and labor groups has resulted in the passage of right-to-know ordinances by many states as well as cities and local governmental bodies. Most of the state laws give workers the right to know about hazardous substances in their workplace but since Philadelphia passed a landmark law entitling the community at large to such information other areas have done the same. Nonetheless, battles about implementation and further refinement of existing laws continue. Also, in some states, the status of proposed legislation is still unclear. The following list gives a rundown of laws actually passed in a large number of states. It was drawn from information supplied by Jill Greenberg, Assistant Executive Director of the Environmental Cancer Information Center at the Mt. Sinai Medical Center, N.Y.

State	Legislation	State	Legislation
Alaska	Worker law covers all workers	Nebraska	Worker Law introduced, indefinitely postponed
California	Worker law; list of hazardous substances; many local laws	New Hampshire	Worker law
Connecticut	Worker law; Workplace Toxic Education & Training for Employees	New Jersey	Worker/community law effective 8/84
Florida	Worker Law; will reintroduce community law; list of hazardous chemicals in 1985	New York	Worker law with later amendments involving citizen suit provision etc; community law proposed in 1984
Illinois	Worker law; community law tabled until 1985; labeling began 7/1984	North Carolina	Worker law possible bill by 1985 session
Indiana	Worker/community law will be reintroduced Fall 1984	Oregon	Worker labeling law; Worker law reintroduced in 1985 session;
Maine	Worker law	Rhode Island	Worker Law
Maryland	Worker Law passed, to be signed	Washington	Labor & Industries Program of public information on hazardous chemicals in workplace effective 7/85
Massachusetts	Community/Worker law effective 9/84	West Virginia	Worker Law
Minnesota	Worker law; community law introduced in 1984	Wisconsin	Worker Law

### Legally Speaking...

## Close-Up of a Right to Know Law

By Mary Sue Henifin

"We are working to make sure that employees get the information they need about health and safety hazards on the job," Nancy Stearns, a New York State Assistant Attorney General in charge of the toxic waste unit of the Environmental Protection Bureau of the New York State Attorney General's Office, and one of the attorneys responsible for prosecuting violators of New York State's Right to Know Law, said in an interview with WOHRC.

While making sure that workers' rights are protected, she tries hard to negotiate ways for employers to comply with the law that are "not overly burdensome," and finds that frequently when a worker has been denied access to material safety data sheets for chemicals used on the job "an official letter from the State is all that's needed to set things straight. Employers often still don't know about the law."

The New York law, which went into effect in December, 1980, requires that employers:

- post notices informing workers of their rights under the law;

- provide employees who may be exposed to toxic substances with information about the identification, nature, health effects and safe uses of these substances;
- provide training to employees who are regularly exposed to toxic substances.

New York's law further protects workers by enabling them to refuse to work with a hazardous substance if they have not received information within 72 hours of requesting it, and prohibits discrimination against any employee who seeks to exercise his or her rights under the law.

So far, New York State has charged three companies in court with violation of the law. Consolidated Edison, an electrical utility, Vulcan Fuel, a home heating oil company, and Resin Optics, a manufacturer of optical lenses, have all been charged with failure to provide information and training. In addition, Vulcan Fuel and Resin Optics were also charged with discriminating against workers who asserted their rights under the law.

Late in August the State won a summary judgment against Resin Optics, the

first substantive court decision under New York's Right to Know Law. In this case, a pregnant woman asked for information about the substances used in her work as a lab technician. Although she was exposed to several hazardous substances the information was not forthcoming; when she asked to be transferred, she was fired.

Stearns is also involved in litigation in federal circuit court to prevent the Federal Hazard Communication Rule promulgated by OSHA in November of 1983 from preempting stronger state Right to Know laws. This issue is crucial because it is one that other states with Right to Know laws (see chart) might have to face. Stearns argues that the N.Y. law "neither conflicts with nor obstructs the federal rule." In addition, she believes that "OSHA's efforts to preempt New York's law violates a Constitutional right of access to information... since manufacturing workers have far broader coverage under the OSHA regulation."

Stearns is concerned about the ultimate impact on the health of workers if New York State's law is preempted: "The Right to Know Law gives workers of New York a tremendously important tool for learning of the nature of their exposure to toxic chemicals and the impact these exposures have on their health and the health of their families." □



# The Infamous Match Industry

By **Vilma R. Hunt**  
Professor, Pennsylvania State University

The match industry of England and America from the mid 1800's to the early 1900's provides one of the most extreme examples of stress and poisoning of workers over a long period of time.

"Phossy jaw" was first described in 1838 when a physician in Vienna diagnosed a severe disease of the jawbone in a woman who was a matchmaker. Although a commission was appointed to review conditions in the seven match factories in Vienna, there, as in the rest of Europe and England "phossy jaw" continued to be associated with the match industry well into the 20th century. The cause was well understood. The fumes of white phosphorus came from the solution used to dip the matchsticks for making the head of the match.

The horror of the disease came from the agony, unbearable stench and facial disfigurement for children and young women who were the most likely to be affected, and we see the evidence of concern in the poems, stories and newspaper accounts of the poor of London.

In America there is almost no evidence of comparable concern from those who wrote to entertain and inform the middle

class, despite the fact that many of the same conditions prevailed. For England there was a wider impact. In 1888 the matchgirls at the largest match factory in London went out on strike to protest the low wages and oppressive and dangerous working conditions. Their action came despite the lack of backing of the trade union movement which had shown no interest in organizing the matchmakers because it was a female industry. With the help of suffrage activists, "socialist" writers and conscience donations from middle class sympathizers the strike was successful in improving work conditions and wages. More important it was part of the wave of "New Unionism" in England. The next year saw the great London dock strike, when dockworkers called for a living wage and more humane working conditions. Many of them were the fathers, brothers and sons of the matchgirls.

By 1906 international agreements were being made to control import and export of white phosphorus matches. Many European countries had already found alternate, safe manufacturing methods. In England the Salvation Army made the elimination of white phosphorus from

matches one of its major missions. General Booth, its leader launched a campaign "In Darkest England" by building a modern safe match factory, paying a liveable wage to show that improvements and a profit were not incompatible. His aim was to eliminate both sweated labor and phosphorus poisoning. In large measure it was the efforts of the Salvation Army, not only in England but also internationally which influenced public opinion and government action.

A continuing campaign by Christian missions in China, Japan and India eventually resulted in elimination of white phosphorus in the match industry throughout the world by the mid-1920's. It is the only example we have of international control (by banning) of a toxic chemical. □

• **THIS FALL, WOHRC Coordinator Barbara Aufiero will leave her post to enter the doctoral program in environmental oncology at New York University under a fellowship. Aufiero, who has been with WOHRC since 1981, will still be part of the Speakers Bureau. □**

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. The review of "Women in the Global Factory" on page 2 was not supported by this funding.

**Columbia University  
WOMEN'S OCCUPATIONAL HEALTH  
RESOURCE CENTER  
School of Public Health  
21 Audubon Ave., 3rd floor  
New York, NY 10032  
Telephone: (212) 694-3737**

*Address correction requested*

Please send me more information about the Women's Occupational Health Resource Center:

I would like to become a WOHRC subscriber. This includes 6 WOHRC Newsletters/year, Factsheets and announcements of other WOHRC publications as they appear during the year.

- \$12 individual  \$25 professional  
 \$25 institutions, libraries, corporations  
 \$30 Friend  \$50 Contributor  
 \$100 Supporter  
 Please send information on group bulk rates.

Please make checks/money orders payable to: WOHRC, Columbia University. (Indicate any change of address.)

Non-Profit Org.  
U.S. Postage  
**PAID**  
New York, NY  
Permit No. 3593