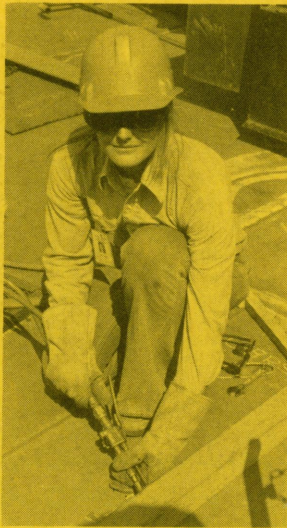


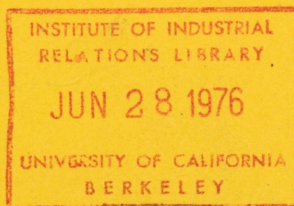
California University Institute of Industrial Relations (Berkeley) Center for
Labor Research and Education. Labor Occupational
Health Project.



WORKING FOR YOUR LIFE:

A WOMAN'S GUIDE TO JOB HEALTH HAZARDS

by Andrea Hricko
with Melanie Brunt



A joint publication of
Labor Occupational Health Program and
Public Citizen's Health Research Group

The Labor Occupational Health Program is part of the Center for Labor Research and Education, Institute of Industrial Relations, University of California, Berkeley. LOHP is a non-profit organization, funded in part by the Ford Foundation, which conducts research and education on safety and health for labor groups and workers in Northern California. Donald Whorton, M.D., is the director.

The Health Research Group is a non-profit, public interest organization engaged in research and consumer action on issues that affect the public health, including occupational safety and health. It is funded by Public Citizen Inc., and is under the direction of Sidney Wolfe, M.D.

NOTE TO READERS

This is a preliminary report. During the summer it will be revised, based on new information and on comments from readers. It will be printed in handbook form in the fall of 1976.

We urge you to send us comments, case studies, photographs, information on industries, occupations, or hazards not yet covered, and names of organizations or unions involved in occupational health problems of women workers.

Send information or photos to:

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SPECIAL THANKS TO : Don Whorton, Janet Bertinuson, and Sid Wolfe, for their time and assistance; Barbara Evans and Gary Fujimoto for their library research; Tim Wan for typing much of the manuscript; Ray Bonner and Diana Obrinsky for their editorial comments; Lydia Vrsalovic and the LOHP staff for their endurance; Vilma Hunt and Clara Schiffer for their long-distance support; Gretchen Davis, formerly Secretary, Health and Safety Committee, Local 115, Butcher's Union, San Francisco; and to the other union staff members and women workers who told us of the health and safety hazards on their jobs.

CREDITS: Ken Light, for his photograph of the pregnant shoemaker .

WORKING FOR YOUR LIFE :
A WOMAN'S GUIDE TO JOB HEALTH HAZARDS

BY ANDREA HRICKO
WITH MELANIE BRUNT

FOREWORD BY GLORIA GORDON, CHAIRPERSON
OCCUPATIONAL HEALTH AND SAFETY TASK FORCE
COALITION OF LABOR UNION WOMEN (CLUW)

**LABOR OCCUPATIONAL HEALTH PROGRAM/
HEALTH RESEARCH GROUP**

JUNE 1976

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The typical family has working wife

United Press International
WASHINGTON

Asbestos Seen as Office Health Hazard

Asbestos exposure has been

Los Angeles Times

Fri., May 28, 1976—Pt II

7

Today's Job Hazard vs. Tomorrow's Baby

Rules Needed to Protect Potential Mothers—as Well as Fathers



many chemicals and reagents toxic to the fetus

Victim Of Asbestos

See Story Page 1
MARTINEZ
63-ve-

to cross the placenta. Some of these lead and metals have been found in the blood of ex-

The needless deaths in industry

temporary social security the right of women to

The Kepone horror story-- how a town was poisoned

WOMEN COMBAT SKIN DANGERS

On the basis of these findings, some countries, including Sweden and the Soviet Union, now routinely transfer women in hazardous industries to other parts of plants as soon as they become pregnant. Salary and seniority are protected by such transfers.

States no such automatic transfers, but workers can bar themselves from hazardous areas by notifying their supervisors.

to their jobs. Acting together, pooling information and observations, support each other, the women got the company to switch from 955 to a lubricant called Downy Fabric Softener in Ivory. In spite of ongoing medical examinations, the substance has no known effects. Two women have had no problems.

Rise in Birth Defects Laid to Job Hazards

By Thomas Ferraro

DAVID BURNHAM

Goodyear Confirms Six Deaths as Tied Possibly to Benzene

Firm Says Workers in Ohio Died From Blood Disease During 1954-64 Period

sands of miscarriages and birth defects that occur each year said Dr. David Wegman, an occupational health expert at the Harvard School of Public Health. He said the damage done to the fetus when the pregnant woman is exposed to benzene is not understood.

Occupational Disease among Operating Room Personnel:

A National Study

Birth Defects among Children of Nurse-anesthetists

Thomas H. Corbett, M.D.,* Richard G. Cornell, Ph.D.,†
Judy L. Endres, B.S.,‡ Keith Lieding, M.D.§

By a WALL STREET JOURNAL Staff Reporter
AKRON, Ohio—Goodyear Tire & Rubber Co. confirmed that between 1954 and 1964 six employees at a plastic-film plant died of blood disease that may have been caused by exposure to benzene.

of 621 female nurse-anesthetists in performed to determine the incidence of birth defects among the offspring of this group.

who studied the incidence of congenital malformations in 5,530 pregnancies in the general population. The incidence of neo-

Hair-Dye Hazard

BY BETTY LIDDICK
Times Staff Writer

her hair was streaked blonde
ashy," she said. Last

Doctor Ties Birth Defects to Cancer-Causing Agent

biochemist,
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His findin

Meat-Wrappers' Respiratory Tract Disease

In 1973, Sokol et al.
symptoms (dyspnea, c
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chloride, was cut w
work as meat wrap

HOSPITAL HAZARDS

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Gregorio (D-Mer
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held

Doctor Testifies on Cancer Agent She Kept Her Job — By Being Sterilized

Toronto

A mother of four says st
keep her job in the battery
Canada Ltd.

The company fears lea
plant could harm unborn ch
was one of six women told

Pesticide Plant Shut By Illness

MDs Testing Radiation Victims

AL, From B1
Life Science
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ctors are continuing to more than the 20 per cent were
white cell blood previously reported, but he son s
ns recently added that tests continue

Coke Oven Work: Hot—And Deadly

Second of Five Articles
By Douglas Watson
Washington Post Staff Writer

"It's the hottest job and the dirtiest
b. You're really in that smoke," Isiah
Kelly said in describing what he did

dirty and potentially dangerous. The
study reported in 1971 that coke oven
workers are 2½ times more likely to
die from lung cancer than are other
steelworkers.

cancer death rate jumps to 10 t
the steelworkers' average.
Coke oven workers also were
to have a death rate eight time
than other steelworkers fro

Sick and Pregnant In a Smoky Office

Last April Lila D.
was working
eta County S
Richmond
smoke

Vinyl Chloride Banned in Sprays

WASHINGTON (AP) — The
U.S. Consumer Product Safety
Commission voted yesterday
commission's staff argued
that nonretroactive refunds
would be inconsistent with the

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Van Camp food process-
t at 1180 Campbell Ave.
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Ca tries has been found in pre-ire-
s' liminary tests to cause cancers plant
in mice, according to an inter-
nal Government memorandum
water were't
men were't
drains, Delgado

CANCER UNIT GIVES CHEMICAL ALERT

Institute Reports on Findings
of Hazard in the Metal and
Dry-Cleaning Industries

By JANE E. BRODY
A chemical widely used in the
the metal and clothing indus-ire-
liminary tests to cause cancers plant
in mice, according to an inter-
nal Government memorandum
water were't
men were't
drains, Delgado

FOREWORD

by GLORIA GORDON, Chairperson

Occupational Health and Safety Task Force
Coalition of Labor Union Women (CLUW)

If you have not yet done much reading about job health, Working for Your Life is a good place to start. If you are already well-informed, you will find new information here about health hazards faced by women workers. This handbook is a much-needed addition to the small but growing number of books and booklets that accurately explain job health hazards in a non-technical way. It is written for those who most need to know -- workers themselves.

Writing for women workers, the authors discuss key questions, such as

- what are the conditions or substances in the workplace that are harmful during pregnancy?
- do pregnant women have the legal right to a job that is safe for their unborn children?
- do chemicals that endanger human reproduction also affect men?
- what are the health hazards in jobs that employ mostly women? and
- what can workers and unions do about job hazards?

Obviously, the answers to these questions are also important to men.

The Task Force on Occupational Health and Safety of the Coalition of Labor Union Women (CLUW) is concerned that insufficient attention has been paid to the physical and mental health of the American worker. The problems of women workers in particular have been almost ignored. Much more progress is needed to make it healthy for women and men to show up for work every day.

It is vitally important to get more of the facts that we now have on women's job health hazards out into the hands of workers. Armed with the facts, working women can then call more loudly for study and action to improve health and well-being on the job.

It is not easy to face up to job health hazards. The data on disease, disability, and death can be terrifying or overwhelming. We all have strong urges to hide our heads in the sand, to hope we will be lucky, or to leave it up to the scientists and the government. But these attitudes do not solve problems.

Knowledge is power. There are things we can learn and do, as this handbook shows. When we have the facts, we can take steps, especially through our labor organizations, to protect our health -- and the health of our co-workers, our working parents, husbands and children.

For centuries women have been health-care providers and decision-makers in the family. We have the potential to become health-conscious leaders in the workplace. These are OUR lives -- let's take charge.

INTRODUCTION

Basically ALL women in the United States work -- unless they are very wealthy or disabled. But a larger percentage of American women work outside the home today than ever before. The changing pattern in employment of women over the last 50 years reflects a basic transformation in American life. Changes in the economy, wars, a move to the cities, advances in technology, educational achievements, changing social attitudes and marriage patterns, legalized contraception and abortion, new equal employment laws, the feminist movement, the growth of day care -- all have contributed to the changing status of women in the job market.

The growth in numbers of women in the workforce far outstrips the rising number of women in the population. Since 1947, the population of women over age 16 in the U.S. has grown by 52% -- but the female labor force has gone up by 123%.^{*} The 1970 Census reported that 43% of the total female population is employed. Over half the women between the ages of 18 to 64 work outside the home today. These 36 million women workers constitute two-fifths of the nation's workforce.

As increasing numbers of women have entered the labor force, many have taken jobs that were previously considered male strongholds. As they have assumed these new jobs, women have also increased their exposure to many hazards. Most of these have never been studied for their potentially harmful effects on either workers or their unborn children.

Only a few thorough investigations of the effects of job exposures on the outcome of pregnancy have ever been published in this country. One

* Wall Street Journal, March 8, 1976, p.1

study found that the risk of miscarriage in female operating room personnel who were exposed to waste anesthetic gases was nearly twice that of unexposed workers. Even more startling, there was an increased risk of birth defects in the children of both male and female operating room personnel.*

Occupational health hazards of women workers can be divided into four categories:

- A. those common to both men and women who are employed in about equal numbers in a job category (e.g., assembly line work)
- B. those related to jobs which typically have been "men's work" but into which women are moving (e.g., police officers)
- C. those related to jobs that are stereotypically "women's work" where the workforce is primarily female (e.g., secretaries)
- D. those which affect fertility or sexual and reproductive functions, where both men and women may be affected, but where women with developing fetuses may have special risks (e.g., exposure to radiation)

Although concerns about the health problems categorized above apply equally to both men and women, five factors highlight the need for this special publication for women workers, as well as the need for much more attention by both private and public sectors:

1. job safety and health has never been a prime concern of industry or government in this country, and the problems of working women generally fall at the bottom rung of the ladder of any concern that has been displayed.

* American Society of Anesthesiologists, "Occupational Disease Among Operating Room Personnel," Anesthesiology, Vol. 41, No. 4, October, 1974, pp. 321-340

2. occupational health research has generally focused on industrial work, where primarily male workers are employed. It is rarely recognized that many non-industrial jobs, which employ predominantly women, are also hazardous.
3. increasing numbers of women are moving into the labor market and into non-traditional jobs that present chemical and physical hazards that have not yet been studied.
4. instead of strengthening their policies to protect all workers and their unborn children, some companies are refusing to hire fertile women in certain jobs (e.g., in lead areas) -- even though employers do not discriminate against fertile male workers who may also risk genetic damage.
5. the majority of women workers are in their child-bearing years, and the federal government recently estimated that over 1 million of these women may be exposed to chemicals that could harm their babies in some way.** When pregnant, these women are not now guaranteed their legal right to work in an environment free from hazards that could affect them or their developing babies. Moreover, the Occupational Safety and Health Administration (OSHA) has set standards for nearly 500 toxic chemicals without considering any of the potentially harmful effects on the offspring of those exposed -- either men or women.

The purpose of this Guide is to educate women workers about hazards and discrimination that they may face on their jobs and to encourage them, their organizations, and their unions to fight to eradicate these conditions.

** Estimate by National Institute for Occupational Safety and Health, May 1976. (From press release of Congressman David Obey (D-Wis), May 10, 1976, concerning the appropriation of \$1 million in funds to NIOSH to conduct studies on birth defects.)

The Guide makes no pretense of covering all the occupational hazards that workers may face. Workers are referred to other handbooks for more comprehensive hazard descriptions. Rather this report deals primarily with Categories C & D of the hazards outlined above:

- those at jobs which employ large numbers of women (such as office workers, lab and hospital workers, beauticians, textile workers, electronics workers) and
- those which may adversely affect the offspring of exposed workers (such as lead, benzene, radiation, anesthetic gases and vinyl chloride) in that they may result in miscarriage, prematurity, birth defects, or genetic damage, even though the mother or father does not suffer any apparent adverse effects from exposure.

In discussing these hazards, the Guide explains the adverse effects of "carcinogens, mutagens, and teratogens" in terms easily understandable by the general public.

In addition, Working for Your Life attempts to explain in simple language some of the recent laws which affect employment practices, including those on sex discrimination in employment and occupational safety and health. It explains why special safety regulations for women of childbearing age -- which end up being discriminatory in the guise of being protective -- appear to be in violation of Title VII of the Civil Rights Act, since they are sex-based.

Finally, the Guide outlines source materials and scientific references for workers to consult. It suggests names of active organizations which offer help to workers in their struggles against sex discrimination and job health hazards. And it offers workers ideas for using the tools of both collective bargaining and the Occupational Safety and Health Act to gain more control over their working conditions.

For it is clear, without working women and men actively fighting to protect their own health and that of their future children, government and industry will voluntarily do very little to eliminate hazardous workplace conditions.

-- PART A --

WOMEN WORKERS:

THEIR CHARACTERISTICS AND NEEDS

CHAPTER 1

AN HISTORICAL PERSPECTIVE

THE HISTORY OF HAZARDOUS WORKING CONDITIONS FOR WOMEN IN THE UNITED STATES

Women have played an increasingly important role in the labor force for several hundred years. Their struggles as oppressed workers and as social and political reformers have continually served to draw attention to the need for improved working conditions and the right to organize -- from the 1834 strike of thousands of textile mill workers in Lowell, Massachusetts, to the nearly two-year long strike by thousands of Chicana women at Farah pants in 1973-74.¹

1870 - 1918

Historically, women first entered the labor force in large numbers as textile mill workers in the mid-19th century. As men moved West, and later as they joined armies to fight the Civil War, new jobs opened for women. This period of rapid industrialization in the United States was accompanied by ever-present occupational hazards and the exploitation of both women and children as cheap labor.

Concerned about the failure of existing unions to answer their needs,* women workers periodically attempted to form their own organization or union. Eventually a mixed group of trade union women, social reformers, and prominent women were successful in forming the Women's Trade Union League in 1903 to lobby for protective legislation and to organize women into unions. (The WTUL survived only until 1925.)²

* In the 1870's only the Cigarmakers Union and the Typographical Union admitted women. Most union policies excluded women and minorities.³ The Knights of Labor began actively organizing women workers in the 1880's.

Middle class women, then awakening to their own political disadvantages, were shocked by stories of the conditions under which women and children labored. These women joined forces with working women's groups to press for a governmental investigation of the problems of women workers. They were successful. Congress funded in 1908 a wide-ranging inquiry on the status, experiences, and difficulties of employed women.⁴

Several glaring examples of health and safety problems for women workers came to public attention during this period. In 1908 an investigation was conducted of workers being poisoned by phosphorus in match factories, where many women were employed. Exposure to phosphorus (which was used as the flame-producing component) resulted in severe degeneration and deformity of the bones, especially of the jaw. Among 2540 exposed workers in the U.S., 151 cases of poisoning turned up. Over one-half were women and children.⁵

In 1909, 20,000 women garment workers went on strike in New York because of deplorable working conditions and more than 10,000 apparel workers went on strike against exploitation in Chicago. As a result, the clothing industry became very strongly organized.⁶ Perhaps the most tragic example of dreadful working conditions for exploited women workers was the 1912 Triangle Shirtwaist Fire in which 154 women and young girls burned to death or died jumping from windows because the building lacked fire escapes, and the doors were locked from the outside. As a result of the tragedy, the New York state legislature passed a regulation requiring safety precautions against fires.⁷

Much other so-called "protective" legislation was first introduced and passed because of the special plight of oppressed women workers. Some of these "protective" laws barred women from certain occupations, while others placed

limits on the weights women were allowed to lift.⁸ In 1908 Louis D. Brandeis persuaded the Court to uphold an Oregon law limiting the working day for women to ten hours on the grounds that "women are fundamentally weaker than men" (a contention later challenged as discriminatory).⁹ Within the next 10 years, 39 states passed or amended legislation dealing with women's working conditions.*

An Absurd Contradiction

A statement made in 1910 by Rose Schneiderman, a cap maker in New York, illustrates how absurd it was that women were not allowed to vote -- but were forced to work under extremely oppressive conditions:

We have women working in the foundries, stripped to the waist, if you please, because of the heat. Of course you know the reason they are employed in foundries is that they are cheaper and work longer hours than men. Women in the laundries, for instance, stand for thirteen or fourteen hours in the terrible steam and heat with their hands in hot starch. Surely these women won't lose any more of their beauty and charm by putting a ballot in a ballot box once a year than they are likely to lose standing in foundries or laundries all year round.

Source: Century of Struggle by Eleanor Flexner, New York, 1972, pp. 258-259

* Some of these "protective" labor laws were only much later extended to male workers. Many of them were never extended to men.

1918 TO THE PRESENT

Some of the taboos and special considerations for women workers disappeared with the advent of war. World War I brought increasing numbers of women into the labor market, many into jobs considered to be male strongholds -- factories, smelters, blast furnaces and industrial operations. The acceleration of women entering the labor force led to the creation in 1918 of the Women's Bureau in the Department of Labor to tend to the needs of women in munitions plants.¹⁰ (It was not until two years later that women even won the right to vote.)

During the first World War, Dr. Alice Hamilton, a pioneer in occupational medicine, recommended special "protective" legislation for women workers, because she recognized that certain chemical substances which enter a pregnant woman's bloodstream can affect the developing embryo or can induce a miscarriage. She was particularly alarmed by the high mortality rates among women employed in the Fall River, Massachusetts, cotton mills.*^{11, 12}

Several incidents in the 1920's seemed to buttress Dr. Hamilton's argument that women workers merited special attention. One involved women watch dial painters in a New Jersey factory. These women drew numbers on watch dials with radium-containing paint so that the numbers would glow in the dark. To make a fine point on their brushes, the women would twist the brushes in their mouths, thereby ingesting some of the radioactive paint. Radioactive particles were given off into the bones and surrounding tissue, leading to degeneration of bone tissue and to severe anemia.¹³ By 1929, before controls were instituted, 42 cases -- 80% of them women -- had been discovered among these workers.¹⁴ In later years, the workers were found

* The belief by many during this time that women were more susceptible than men to toxic chemicals has been generally proven to be mythical.

to have a higher than expected incidence of cancer.¹⁵

During the Depression, the unemployment rate was much higher for blacks and women than for white men. But with the advent of war, employers turned to women as thousands of men left for armed service. The influx of women into the labor force during World War II prompted the most comprehensive critical investigation ever conducted on women's occupational health problems. The resulting report entitled Women in Industry (1946) sponsored by the U.S. Army, again recommended special protective measures for pregnant women workers.¹⁶ Its author, Dr. Anna Baetjer, advised that the concentrations of toxic substances "usually accepted as allowable should not be considered safe for a pregnant woman" since the exposure might adversely affect her or her fetus. Among the chemicals implicated by the report as dangerous were benzene, carbon monoxide, carbon disulfide, hydrocarbons, lead, mercury and radiation. In 1942 the Department of Labor's Women's Bureau head recommended that pregnant women be transferred out of all workrooms in which these substances were used.¹⁷ Dr. Baetjer carefully pointed out, however, that there was no good scientific evidence indicating that non-pregnant women were any more susceptible to toxic substances than men.

Special interest in the problems of pregnant women workers rapidly declined when World War II ended, however. Many women either returned to their homes or moved into other less dangerous (or lower-paying) jobs as enlisted men returned from the war to their factory jobs. Ironically, this special research suffered a setback as the women's rights movement gained momentum. The concept of "protective" legislation became objectionable to women, since it was often based on the assumption that women were physically inferior and belonged in the home. Women began to recognize that labor legislation which was originally designed to protect them could also be used to exclude them

from jobs for which they were qualified.

During the 30 years since Dr. Baetjer's report, industrial hygiene recommendations for pregnant women workers have gone mostly unheeded and few advances have been made in scientific research on the topic. A 1975 report on Occupational Health Problems of Pregnant Women written by Vilma Hunt for the Department of Health, Education & Welfare documents the failure of the government and scientific communities to pursue the study of these hazards since 1946. It also shows that the vast majority of occupational health studies in the years from 1945-1975 dealt with male workers.¹⁸

But during these intervening years there has developed an increasing awareness of the devastating effects that hazardous drugs, such as DES¹⁹ and Thalidomide,²⁰ can produce in the children of pregnant women. These discoveries, coupled with legalized contraception and abortion, added to the increasing demands by women that they be allowed to exert control over what was being done to their bodies. At the same time, women began moving into the labor force more rapidly as laws against employment discrimination were enacted. But again, they recognized that labor organizations did not adequately address their needs, so women in the early 1970's formed their own organizations to fight for their rights. The Coalition for Labor Union Women and Union WAGE continue to carry on an active fight to improve working conditions for women (See Chapter 2D).

In 1970 the Occupational Safety and Health Act (OSHA) was passed. With its enactment public awareness of job hazards has grown dramatically. This awareness has led all workers to question the adequacy of safeguards in their workplace and has led women workers to question the safety of exposures during pregnancy. But it was not until May 1976 that the National

Institute for Occupational Safety & Health was promised funds for a special program to study the incidence of birth defects and miscarriages among women workers.²¹ Dr. John Finklea, Director of NIOSH, had said in an earlier interview: "The first thing is to get all of us male chauvinist pigs thinking about this problem. But it looks to me that this is a significant health question and a very powerful problem that is hard to discount."²²

Recent medical studies of lead poisoning in smelters, lung cancer in asbestos workers, and increased disease among operating room personnel, makes one wonder if the times and conditions have really changed very much since the turn of the century. And the sudden resurgence of interest in potential reproductive effects of toxic exposures makes one realize how little progress has been made since the World War II report.

Informed women workers can help to insure that this history of ignoring women workers' problems is not repeated. Through using the tools of collective bargaining and OSHA, and by demanding their rights to a safe and healthful job, they can begin to correct the hazardous conditions that deplorably still exist in today's workplaces.

READING SUGGESTIONS

San Francisco Women's History Group. What Have Women Done? -- A Photo Essay on the History of Working Women in the United States. (San Francisco, 1973).

Maupin, Joyce. Labor Heroines: Ten Women Who Led the Struggle, issued by Union WAGE Educational Committee (P. O. Box 462, Berkeley, Ca. 94701).

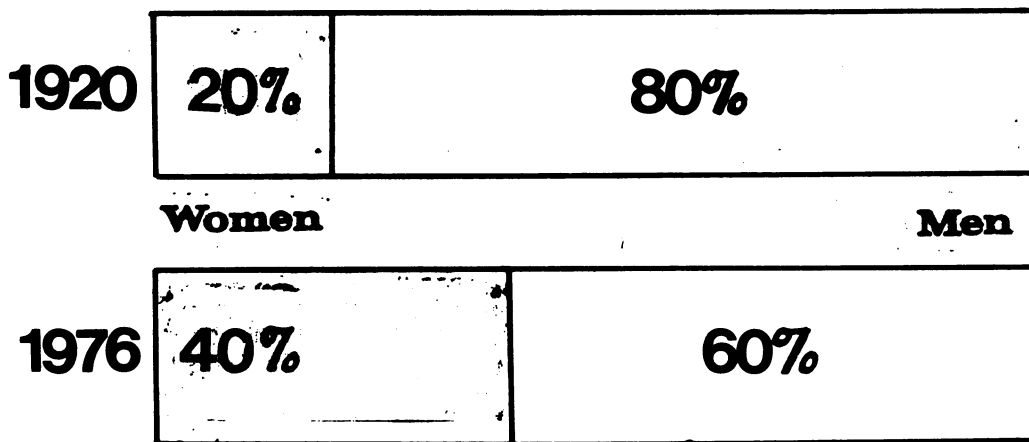
CHAPTER 2

TODAY'S WORKING WOMEN: THEIR NUMBERS, JOBS, AND UNIONS

A. GENERAL STATISTICS

In 1920, women made up only 20% of the nation's labor force. Today, the percentage is 40% and is on the rise (see Figure 1 below). But women's earnings are still grossly lower than men's. In 1974 women generally earned only about 60% as much as their male counterparts: median earnings of women in 1974 were \$6,957* compared with \$12,152 for men.¹

FIG. 1 CHANGES IN PERCENTAGE OF WORKFORCE BY SEX



The percentage of women who are working is also on the rise, as Table 1 illustrates.

* This means that one-half of working women earned less than \$6,957 and one-half earned more.

Table 1 Women in the Labor Force, Selected Years, 1890- 1974

DATE	NUMBER	As percent of all workers	As percent of female population
1890 (June)	3,704,000	17.0	18.2
1900 (June)	4,999,000	18.1	20.0
1920 (Jan.)	8,229,000	20.4	22.8
1930 (April)	10,396,000	21.9	23.6
1940 (March)	13,783,000	25.4	28.9
1945 (April)	19,290,000	36.1	38.1
1950 (April)	17,882,000	29.1	33.0
1970 (Nov.)	33,539,000	39.6	42.3 ²
1974	35,825,000	39.4 ³	

SOURCE: 1969 Handbook on Women Workers.
U.S. Women's Bureau, 1969.

B. FACTS ON WOMEN WORKERS *

HOW MANY WOMEN WORK?

- Nine out of ten women will work outside the home at some time in their lives.
- More than 35 million women are in the labor force; they constitute nearly two-fifths of all workers.
- More than half of all women 18 to 64 years of age are workers.

WHY DO WOMEN WORK?

- A majority of women work because they must. About three-fifths of all women workers are single, widowed, divorced, or separated, or have husbands whose earnings are less than \$7,000 a year.
- Among all families, about 1 out of 8 is headed by a women; almost 3 out 10 black families of all incomes are headed by women. Of all women workers, 1 out of 10 is a family head; 1 out of 5 minority women workers is a family head.
- Among all poor families, more than 2 out of 5 are headed by women; almost 2 out of 3 poor black families are headed by women.*

HOW MANY MOTHERS AND WOMEN OF CHILD-BEARING AGE WORK?

- The majority of women workers are in their child-bearing years. Labor force participation is highest among women 18 to 24 and 35 to 54 years of age; the average age of women workers is 36 years.
- The number of working mothers (women with children under 18) has increased about ninefold since 1940. They now number 13.0 million, an increase of 3.7 million in the last decade.
- The 4.8 million working mothers with children under 6 in 1973 had 6.0 million children under 6; unfortunately the estimated number of licensed day care slots is only 920,000.

HOW DO WOMEN'S JOBS COMPARE WITH MEN'S?

- Women workers are concentrated in low-paying dead end jobs. As a result, the average woman worker earns less than three-fifths of what a man does, even when both work full time year round.

* Adapted from U.S. Department of Labor, Women's Bureau, "Twenty Facts on Women Workers," June 1974.

* Classified as poor were those nonfarm families of four with total income of less than \$4,275 in 1972.

- Fully employed women high school graduates (with no college) have less income on the average than fully employed men who have not completed elementary school.
- Women are 77 percent of all clerical workers but only 5 percent of all craft workers.
- The median wage of full-time year-round private household workers was only \$2,365 in 1972. (Effective May 1, 1974, most private household workers were covered by Federal minimum wage and over-time legislation.)

C. WHERE DO WOMEN WORK?

Work can be categorized by specific occupation (see Tables 2 and 3) or by specific industry (see Table 4).

BREAKDOWN BY OCCUPATION

As the table below indicates, the job distribution of women is quite different from that of men:

Table 2 Occupational Distribution by Sex, 1970

<u>Occupations</u>	<u>% of all women workers in occupation</u>	<u>% of all male workers in occupation</u>
Clerical workers	37.5	8.6
Professional and technical workers	16.6	14.6
Service workers	17.1	8.8
Operatives	15.0	15.2
Salesworkers	7.4	6.9
Managers and administrators	3.2	10.5
Craft workers	1.8	22.2
Laborers	.9	7.0
Transport equipment operatives	.5	6.4
Total percentage	100.0	100.0

Source: Monthly Labor Review, May, 1974, p. 7

In the categories above, women are: 73% of all clerical workers, 55% of all service workers, 40% of professional and technical workers, and 39% of all sales workers. But they are only 5% of all craftsmen.⁴

The table below shows the 20 occupations in which over one-half of all women worked in 1970.

Table 3 20 Leading Occupations of Employed Women, 1970

(Women 16 years of age and over)

Occupations	Number of women employed	As a % of all women workers
All occupations	28,929,845	100
20 leading occupations	15,440,455	53.4
Secretaries	2,638,033	9.1
Sales clerks, retail trade	1,470,707	5.1
Bookkeepers	1,258,111	4.3
Elementary school teachers	1,182,887	4.1
Typists	920,612	3.2
Waitresses	907,466	3.1
Sewers and stitchers	812,716	2.8
Registered nurses	807,359	2.8
Cashiers	689,461	2.4
Private household cleaners and servants ¹	644,178	2.2
Nursing aides, orderlies and attendants	609,022	2.1
Cooks, except private household	523,485	1.8
Secondary school teachers	491,489	1.7
Assemblers	454,611	1.6
Hairdressers and cosmetologists	424,873	1.5
Telephone operators	384,543	1.3
Checkers, examiners, and inspectors manufacturing	327,530	1.1
Packers and wrappers, except meat and produce	314,067	1.1
File clerks	292,252	1.0
Receptionists	287,053	1.0

¹ Occupation title changed, October 1973; previously classified as Maids and servants, private household.

Source: U.S. Department of Commerce, Bureau of the Census: Census of Population, 1970, Detailed Characteristics, U.S. Summary, PC(1)D1.

The list below, also showing data from the 1970 U.S. Census, shows occupations in which both (1) over 10,000 women are employed, and (2) over one-half of all workers employed are women.

librarians
 dieticians
 registered nurses
 therapists
 clinical lab technicians
 dental hygienists
 health record technicians
 radiologic technicians
 health technicians
 religious workers
 social workers
 teachers (except college
 or university)

private household:
 housekeepers
 laundresses
 maids and servants
 child care workers
 cooks

clothing ironers and pressers
 dressmakers
 graders and sorters - manufacturing
 produce graders and wrappers
 laundry and drycleaning operatives
 meat wrappers (retail trade)
 packers and wrappers (not meat or
 produce)

demonstrators or peddlers
 sales clerks (retail trade)

airline stewardesses
 personal service attendants
 child care workers
 hairdressers and cosmetologists
 housekeepers (not private house-
 holds)
 school monitors
 welfare service aides
 crossing guards

interviewers
 file clerks
 library attendants
 office machine operators
 payroll clerks
 proofreaders
 receptionists
 secretaries
 statistical clerks
 stenographers
 teachers aides
 telephone operators
 typists
 clerical workers, misc.

bank tellers
 billing clerks
 bookkeepers
 cashiers
 counter clerks (not food)

sewers and stitchers
 shoemaking machine operatives
 solderers
 textile operatives
 electrical machinery and
 equipment manufacturing
 apparel and other fabricated
 textile products, manufacturing

bookbinders
 window dressers and decorators

cleaners and charwomen
 cooks
 food counter and fountain workers
 waitresses
 food service workers
 dental assistants
 health aides
 health trainees
 nursing aides
 practical nurses

BREAKDOWN BY INDUSTRY

Table 4 : Women employed as workers in non-agricultural industries, where women constitute more than 40% of the workers, 1973*

	# of women	% of total employed
<u>Manufacturing, durable and non-durable goods</u>		
Electrical equipment and supplies	781,000	41%
Poultry dressing plants	52,000	55%
Canned, cured and frozen seafood	21,000	56%
Confectionary and related products	41,000	51%
Tobacco manufacturers	30,000	42%
Textile mill products	467,000	46%
Knitting mill	174,000	65%
Apparel and other textile products	1,062,000	81%
Printing and publishing		
Periodicals	34,000	50%
Bankbooks and bookbinding	29,000	51%
Leather and leather products	175,000	60%
<u>Transportation and public utilities</u>		
Communications	542,000	47%
Telephone communications	493,000	51%
<u>Wholesale and retail trade</u>	6,338,000	40%
Retail trade	5,426,000	46%
Retail merchandise	1,708,000	68%
Apparel stores	505,000	66%
Eating and drinking places	1,431,000	55%
Drug stores and proprietary stores	295,000	62%
<u>Finance, Insurance and Real Estate</u>	2,070,000	52%
Banking	721,000	64%
Credit agencies other than banks	234,000	57%
Insurance carriers	578,000	52%
Insurance agents, brokers and services	172,000	59%
<u>Services</u>	6,803,000	55%
Hotels, tourist courts, motels	346,000	52%
Personal services	555,000	62%
Advertising	50,000	43%
Credit reporting and collection	57,000	71%
Medical and other health services	2,850,000	80%
Hospitals	1,641,000	80%
Legal services	171,000	63%
Educational services	593,000	49%
Elementary and secondary schools	255,000	61%
Colleges and universities	272,000	42%
<u>Government</u>	6,066,000	45%
State	1,248,000	43%
Local	4,050,000	50%

*Adapted from Table 2 , Monthly Labor Review, May 1974, p. 6

D. WOMEN IN LABOR UNIONS

Women have played an important role in the American labor movement. But just as most employers have practiced sex discrimination, so have many unions. Many international unions actually barred women from joining until the 1920's.⁵ In 1972, there were still 39 unions that had no women members.⁶

Today, however, more and more unions are actively organizing women workers and helping them try to achieve equality in the workplace. But although union women earn more than non-union workers,⁷ five out of six women workers still do not belong to labor unions or associations. In 1974 only 16.8% of the female workforce was organized into unions or associations compared to 24.5% of male workers.⁸

The 4,524,000 women workers who belonged to labor unions in 1972 constituted 21.7% of total union membership.⁹ Thus, two out of every five workers in the U.S. are women but only one out of five union members is a woman. In union leadership, men generally still hold most posts on national governing bodies, even in unions where a majority of members are women.¹⁰ In the 24 unions with more than 50,000 women members (see Table 5), only 6 out of 187 national officers and officials were women, and only 18 of the 556 executive board members were women, according to a 1972 survey.¹¹

Table 5. Women in unions and associations with 50,000 women members or more, 1952, 1962, 1970, and 1972

[Numbers in thousands]

Union	Women membership							
	1952		1962		1970		1972	
	Number of women members	Percent of total membership	Number of women members	Percent of total membership	Number of women members	Percent of total membership	Number of women members	Percent of total membership
Total, all unions.....	3,000	17.9	3,272	18.6	4,282	20.7	4,524	21.7
Total, selected unions.....	1,862	21.0	2,582	26.1	3,475	27.7	3,674	28.9
Total, all unions and associations.....					5,398	23.9	5,736	24.9
Total, selected unions and associations.....					4,457	31.8	4,646	32.6
AFL-CIO:								
Bakery Workers ¹	60.2	35.0	(²)	(²)	60.7	40.0	51.0	35.0
Clothing Workers.....	261.8	68.0	282.0	75.0	289.5	75.0	273.8	75.0
Communications Workers.....	(²)	(²)	139.3	50.0	231.9	55.0	230.5	52.0
Electrical Workers (IUE).....	(²)	(²)	98.2	33.3	105.0	35.0	116.0	40.0
Electrical Workers (IBEW).....	150.0	30.0	237.9	30.0	276.5	30.0	287.0	30.0
Government Employees (AFGE).....	(²)	(²)	26.5	25.0	(²)	(²)	(²)	(²)
Hotel and Restaurant Employees.....	(²)	(²)	200.3	45.0	(²)	(²)	(²)	(²)
Ladies' Garment Workers.....	292.5	75.0	330.8	75.0	353.9	80.0	342.4	80.0
Machinists.....	(²)	(²)	86.8	10.0	100.4	11.6	106.1	14.0
Meat Cutters ³	59.3	18.1	64.2	14.9	61.7	12.5	92.5	17.5
Office Employees.....	(²)	(²)	40.0	66.7	57.8	70.0	52.8	64.0
Paperworkers ⁴	35.7	13.6	(²)	(²)	(²)	(²)	(²)	(²)
Postal Workers ⁵	(²)	(²)	15.8	7.8	59.0	20.0	107.4	45.0
Railway Clerks.....	36.0	12.0	48.0	16.0	110.0	40.0	(²)	(²)
Retail Clerks.....	125.0	50.0	182.0	50.0	(²)	(²)	316.6	50.0
Retail, Wholesale and Department Store Union.....	14.6	15.1	63.7	40.0	70.0	40.0	79.1	40.0
Rubber Workers.....	(²)	(²)	(²)	(²)	(²)	(²)	(²)	(²)
Service Employees.....	55.5	30.0	82.4	28.0	152.3	35.0	145.2	30.0
State, County and Municipal Employees.....	(²)	(²)	(²)	(²)	146.7	33.0	195.7	37.0
Steelworkers.....	80.0	7.3	(²)	(²)	120.0	10.0	175.0	12.5
Teachers.....	37.5	75.0	42.5	60.0	88.3	43.0	129.2	52.0
Textile Workers Union of America.....	(²)	(²)	73.2	40.0	71.2	40.0	69.6	40.0
Unaffiliated:								
Auto Workers ⁶	118.4	10.0	139.6	13.0	193.1	13.0	195.1	14.0
Teamsters.....	(²)	(²)	(²)	(²)	255.0	13.9	(²)	(²)
Employee Associations:								
Civil Service (NYS).....	(²)	(²)	(²)	(²)	76.0	40.0	(²)	(²)
Education Association.....	(²)	(²)	(²)	(²)	726.1	66.0	736.7	63.2
Nurses Association.....	(²)	(²)	(²)	(²)	(²)	(²)	(²)	(²)

¹ Includes the Bakery and Confectionery Workers' International Union of America (Ind.) and the American Bakery and Confectionery Workers' International Union (AFL-CIO).

² Figure not reported to the Bureau or not available.

³ Includes Packinghouse Workers (AFL-CIO) in 1952 and 1962.

⁴ Includes Papermakers (AFL), Paperworkers (CIO) and Pulp, Sulphite Workers (AFL) in 1952; the Papermakers and Paperworkers (AFL-CIO) and Pulp, Sulphite Workers (AFL-CIO) in 1962 and 1970; and the United Paperworkers (AFL-CIO) in 1972.

⁵ Includes the National Postal Union (Ind.), Postal Clerks (AFL-CIO), Special Delivery Messengers (AFL-CIO), General Services Maintenance Employees (AFL-CIO), Motor Vehicle Employees (AFL-CIO), and Postal Workers Union (AFL-CIO). On July 1, 1971, these five unions merged to form the American Postal Workers Union (AFL-CIO).

⁶ Affiliated with the CIO in 1952 and with the AFL-CIO in 1962.

NOTE: Unlike table 1, figures include members in areas outside the United States, primarily in Canada.

Source: Berquist, Virginia. "Women's Participation in Labor Organizations," Monthly Labor Review, October 1974, p. 6.

Six of the unions in the above table had membership of over 50% women: Ladies Garment Workers, 80%; Clothing Workers, 75%; Office Employees, 64%; Communications Workers, 52%; Teachers, 52%; and Retail Clerks, 50%.

More and more women are joining labor unions, but they are joining the workforce at faster rates than they are being organized. From 1958 to 1973, the percentage of women who were active union members (excluding associations) dropped from 17% to 12%, partly due to increased employment in job categories that are not largely unionized, such as clerical workers.¹² The decline among males was not quite as great.

A number of women's organizations and unions have recently begun to promote concerns of special interest to women workers, such as organizing the unorganized, equal pay, day care, maternity benefits, voluntary overtime, and occupational health. Additional efforts have been made to increase the number of women among elected union officials. Women caucuses have been formed in some unions, national conferences have been held, and women are being trained as organizers.

ACTION!

- The Auto Workers (UAW) (195,000 women; 14% of membership) and Electrical Workers (IUE) (116,000 women; 40% of membership) are examples of unions with very active women's departments which are aggressive in supporting the interests of women union members through conferences, litigation, publication of materials, and lobbying activities.
- The Oil, Chemical and Atomic Workers International Union -- the most active union in the country in health and safety -- has published a paperback HANDBOOK FOR OCAW WOMEN by Kathy Stone. (P. O. Box 2812, Denver, Colorado 80201) The 82 page pamphlet is a gold-mine of information on the legal rights of women in the workplace and how to secure them.

- The Coalition of Labor Union Women (CLUW) was formed in March 1974 to work within the labor movement for better working conditions for women. It currently has about 5000 members nationwide. Goals include: organizing more women; encouraging women to participate more actively in their unions; achieving affirmative action in the workplace and pressing for legislative action on women's issues such as day care. CLUW has formed an Occupational Safety and Health Task Force. For information on membership or local chapters (non-union women are not eligible), contact Gloria Johnson c/o IUE, 1126 16th Street, N.W., Washington, D.C. 20036.
- Union WAGE (Women's Alliance to Gain Equality) was formed in Berkeley, California in March 1971. The organization includes working women, including those unemployed, retired and on welfare. Its goals include fighting for equal pay and equal opportunities, organizing the unorganized, ending male domination in unions, and campaigning to extend truly "protective" labor legislation covering women to men workers. A bimonthly newsletter with useful "How To" information is published. Union WAGE, Box 462, Berkeley, Ca. 94701.
- Various universities have special STUDY PROGRAMS FOR LABOR UNION WOMEN. For example, both Pennsylvania State University and the University of Maine have continuing education programs for women workers which include occupational health. Other schools have leadership programs for women union members which include occupational health. Some of these programs include:

SUMMER SCHOOLS FOR UNION WOMEN, sponsored by the University and College Labor Education Association.

** Midwest Contact Joyce Kornbluh
Inst. of Labor Relats.
University of Michigan
108 Museums Annex
Ann Arbor, Mich. 48104

** South Contact Barbara Musselman
Labor Education Center
University of Alabama
University Station
Birmingham, Ala. 35294

** Mid. Atlantic &
Northeast Contact Saul Nesselroth
Labor Education Center
-U 3
University of Connecticut
Storrs, Conn. 06268

- Cornell University has a TRADE UNION WOMEN'S STUDIES PROGRAM, with courses (some for college credit), conferences, and workshops. This spring a six week course on occupational health and safety for women workers was taught by Jeanne Stellman, author of Work is Dangerous to Your Health.

Contact Barbara Werthheimer, Director
Trade Union Women's Studies Program
Cornell University, NYSSILR
7 East 43rd Street
New York, New York 10017

CHAPTER 3

LAWS AFFECTING WOMEN'S JOBS

A. LAWS PROHIBITING EMPLOYMENT DISCRIMINATION

FEDERAL LAWS

Equal employment opportunity is closely related to the health and safety issues that this book addresses. As a result of Title VII, women for the first time have the right to work at jobs that have traditionally been male strongholds. Many of the health hazards of these jobs have never been adequately studied.

In addition, this legislation is relevant in cases where women are told by employers that they cannot be employed in particular jobs or departments because they are capable of bearing children or because they are pregnant. (See Chapter 5 for the relationship of Title VII to the requirements of the Occupational Safety and Health Act.)

Ratification of the Equal Rights Amendment would be the most vital step toward insuring equal employment opportunities for women. The proposed constitutional amendment would guarantee that "equality of rights under the law shall not be denied or abridged by the United States or any State on account of sex." Under the amendment, discrimination by any local, state, or federal government on the basis of sex would be unconstitutional.

The proposed amendment was passed by Congress in 1972. To become effective 38 states must ratify it by 1979. As of May 1976, 34 states have ratified. If the amendment is ratified, it would require that men and women be treated equally.

Four major federal laws or orders forbid discrimination against women
*
workers. These include:

1. Title VII of the 1964 Civil Rights Act
2. The Equal Pay Act
3. Executive Orders 11478 and 11246 as amended by Executive Order 11375
4. Age Discrimination in Employment Act

1. Title VII is the broadest federal law against sex discrimination. Under the law, in most instances it is illegal for an employer, labor union, or employment agency to discriminate on the basis of race, sex, religion, or national origin. The law covers hiring, promotion, layoff, training, seniority, and discharge practices. The law is administered by the Equal Employment Opportunity Commission (EEOC) and covers only workers in companies with 15 or more employees (or unions with 15 or more members). Relying on Title VII, courts have ruled that companies may not give light work to women and heavy work to men; that employers may not segregate help-wanted ads by sex; and that a woman may not be forced to take unpaid maternity leave just because she is pregnant. A myriad of other cases are currently before the courts.

2. The Equal Pay Act essentially requires that women and men receive "equal pay for equal work." Standards and criteria for equal work are matters of judgement and many employers have found loopholes. The Act is administered by the Labor Department's Wage and Hour Division. It deals only with equal pay and not with equal opportunity. Even though an employment practice does not violate the Equal Pay Act, it may still be in violation of Title VII.

3. The Executive Orders are issued by the President. Basically they forbid discrimination in employment by the federal government, as well as discrimination by any federal government contractors. The Executive Orders

***See handbooks by Kathy Stone and Susan Ross, described below in ACTION.**
Also useful is "A Working Woman's Guide to Her Job Rights" by U.S. Women's Bureau.

also require that employers develop "Affirmative Action" plans with goals and methods outlined to insure fair treatment of women workers. Executive Order 11246 is administered by the Department of Labor's Office of Federal Contract Compliance (OFCC); Executive Order 11478 is administered by the Civil Service Commission.

4. The Age Discrimination in Employment Act prohibits employers, employment agencies and labor unions from discriminating on the basis of age against any person between the ages of 40 and 65. The Act covers hiring, firing, promotion and other employment practices. Although it is not specifically an act that speaks to sex discrimination, it is relevant because many women workers want to return to the labor market past the age of 40, after raising a family. The law is enforced by the Wage and Hour Division of the U.S. Department of Labor.

STATE LAWS

Many states have laws that forbid discrimination against women in employment. These vary greatly from state to state. States may have their own equal pay acts, public employee laws, state contract laws, etc.

Many states also have "protective labor laws" that were passed around the turn of the century because of the oppressive conditions under which women labored. Originally designed to protect women, they quickly became means of discriminating against women workers by putting restrictions on the jobs they could have, the number of hours they could work, the weights they were allowed to lift, etc. Many of the laws were based on the assumption that women belong in the home and that women are fundamentally weaker than men.

With the passage of Title VII, many of the state laws have been challenged

by women workers. Courts have consistently ruled that these state regulations violate Title VII because they discriminate against women workers.

Any of the state laws which are truly protective -- such as those which require lounges, restrictions on mandatory overtime, and on weight-lifting -- should be extended to protect male workers as well, but they should not be used to discriminate against women workers.

NON-TRADITIONAL JOBS FOR WOMEN

Women have made some breakthroughs in employment barriers as a result of new equal employment and equal pay laws. They have been hired for many jobs which had traditionally been reserved for males only, such as coal miners, plumbers, policewomen on the beat, welders, fork lift operators, jockeys, truck drivers, "longshoremen," "mailmen," telephone installers and line "repairmen." The hazards in some of these jobs have never been studied.

Apprentice programs -- long-time male bastions -- have also become more accessible to women. Women were first accepted as apprentice painters and "journeyman" carpenters in 1972.¹ But women are still enrolled in only 70 apprentice training programs, even though about 400 occupations offer them.² And women still constitute only 6% of all construction workers.³

In California, apprenticeship programs are being ordered to open their doors to women. In December 1975 only 312 of the 30,233 active California apprentices were women.⁴ Under a change in the state law all joint apprenticeship councils throughout the state are now required to establish goals and time-tables for admitting women into their programs.

A California lawsuit filed in June 1976 seeks to eradicate the 31-year old age cut-off for entering apprentice training programs, an age limit

generally applied throughout the country. Many women leave the labor market to raise children and do not return until after they have passed the age limit. The suit was filed by two women, ages 46 and 32, who were denied applications to be cook and electrician apprentices because of their age.⁵

In the white-collar areas there is an increasingly liberal policy of opening middle-management positions to women. But the gains are very gradual. For example, whereas 9 out of 10 bank tellers are women, only 2 out of 3 bank officials or financial managers are women.⁶ Gains in the professions are also slow. Women comprise 97% of all nurses, but are only 10% of all physicians.⁷

We should also note that men have been knocking down some barriers to jobs that have traditionally been considered "women's work" -- secretaries, telephone operators, nurses, and flight attendants.

ACTION

- Two paperback books are highly recommended as reading for women workers who are concerned about discrimination by their employer or their union:

Kathy Stone, Handbook for OCAW Women, Oil, Chemical and Atomic Workers International Union, Denver, 1974.

Susan Ross, The Rights of Women, An American Civil Liberties Union Handbook, New York, 1973.

- A number of public interest groups litigate in the area of sex discrimination. Some of these groups handle cases concerning discrimination by employers, unions, and apprentice programs. Others are developing expertise in health and safety. Some of these groups are:

* Equal Rights Advocates, 433 Turk Street, San Francisco, Ca. 94102

* Public Advocates, 433 Turk Street, San Francisco, Ca. 94102

* Center for Law and Social Policy, 1751 N St., N.W., Washington, D.C. 20036

-- Two organizations which have special programs on apprentices are:

- * Women and Apprenticeship, a program within Advocates for Women (3228 Adeline Street, Berkeley, Ca. 94703) offers women pre-apprenticeship training, counsels women on placement in apprentice programs, and offers support services to women apprentices during their training.
- * The Labor Occupational Health Program, University of California, Berkeley, is developing the first special training course in the country on health and safety for apprentices. (Floor coverers and molders will be covered this year.) Contact Janet Bertinuson, Coordinator, (address on cover).

B. THE OCCUPATIONAL SAFETY AND HEALTH ACT

OSHA AT A GLANCE: WHAT THE LAW SAYS*

STANDARDS

In 1970 Congress passed the Occupational Safety and Health Act. The Act establishes minimum standards for working conditions. Hazards not mentioned in the standards are covered by the "general duty clause," which requires each employer to maintain a workplace "free from recognized hazards."

ENFORCEMENT

The Act establishes the Occupational Safety and Health Administration in the Department of Labor. OSHA enforces the standards by inspecting workplaces and levying fines. The law provides for fines of up to \$1000 for each violation, and up to \$10,000 if the violation is willful or repeated.

INSPECTIONS

Any worker covered by OSHA can request an inspection by sending a completed complaint form to the nearest OSHA office. OSHA will keep your name secret if you request. On the day of the inspection an OSHA inspector tours the plant, accompanied by representatives of workers and of management. After the inspection, a citation listing violations and deadlines for cleaning them up is sent to management and to the person who requested

the inspection. Management must post its copy near the violations for three days, or until they have been corrected, whichever is longer. If no citation is issued, OSHA sends the person who requested the inspection a letter stating that no violations were found.

APPEALS

OSHA has its own review commission. Management can appeal violations, fines, and the deadlines for eliminating hazards. Workers can appeal only the deadlines.

WHO IS COVERED

OSHA covers most workers; the number of employees at the workplace makes no difference. A few special groups of workers, like miners and federal employees, are covered by other agencies.

State, county and municipal workers are not covered by OSHA. Nor are household workers who work in their employer's home.

The Act allows states to replace OSHA with their own agencies. These state plans must provide standards and enforcement "at least as effective" as the standards and enforcement under OSHA.

* Reprinted with permission from How to Use OSHA: A Worker's Action Guide to the Occupational Safety and Health Administration, published by Urban Planning Aid, Cambridge, Massachusetts, 1975, pp. 2-3.

Responsibility for carrying out the provisions of the 1970 Occupational Safety and Health Act is divided between the Department of Labor's Occupational Safety and Health Administration (OSHA) in Washington, D.C. and the Department of Health, Education, and Welfare's National Institute for Occupational Safety and Health (NIOSH), with offices in Rockville, Maryland, and Cincinnati, Ohio. Briefly,

OSHA is responsible for setting and enforcing standards, conducting inspections of workplaces, insuring that employers maintain records of their health and safety experience, and monitoring the 22 states that have taken over from the federal government the enforcement of job safety and health (see Appendix A for list of states with "state plans.")

NIOSH is responsible for writing Criteria Documents which contain recommendations to be used by the Department of Labor when setting Federal standards, for conducting research on occupational diseases, and for conducting Health Hazard Evaluations of toxic substances in workplaces when workers or their representatives request them.

The law is designed to protect ALL workers -- and does not make exclusions on the basis of age, race, sex fertility or pregnancy. The stated purpose of the federal law is to:

assure so far as possible every working man and woman in the Nation safe and healthful working conditions.....
[Section 2(b)]

In part, Congress stated that this is to be accomplished by providing:

medical criteria which will assure insofar as practicable that no employee will suffer diminished health, functional capacity, or life expectancy as a result of his work experience.....[Section 2(b)(7)]

The law states that each employer has the duty to:

furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees.....
[Section 5(a)(1)]

Although the Occupational Safety and Health Act is an important law that could greatly improve workplace conditions, enforcement of the Act has been weak and ineffective. NIOSH and OSHA are both grossly understaffed and underfunded. There are not enough inspectors to insure enforcement of the law. Inspectors do not have adequate training in recognizing potential health hazards, as opposed to safety hazards. The fines meted out by both state and federal agencies barely dent industry's pocketbook and thus provide little, if any, incentive to provide a safe working place.

In addition, the process of setting new standards moves very slowly. Since passage of OSHA in 1970, only three new standards for health hazards have been published. These covered cancer-causing chemicals*, vinyl chloride, and asbestos. And even these standards will not totally protect workers. In each of these three cases, labor unions and public interest groups had to initiate action. Standards for other hazards have been delayed by the Department of Labor for months, supposedly because the agency needs more time to study the "inflationary impact" of setting stricter standards.

Workers and labor unions must push for more effective enforcement of the law -- so that the rights guaranteed by the Act are meaningfully preserved. Workers who thoroughly know the law can use it, along with other workplace strategies -- such as grievance procedures and collective bargaining -- as an effective weapon against job health hazards.

***In addition to vinyl chloride and asbestos, OSHA has special regulations for 14 cancer-causing chemicals: 2-acetylaminofluorene, 4-aminodiphenyl, benzidine and its salts, bis(chloromethyl)methyl ether, 3,3'dichlorobenzidine and its salts, 4-dimethylaminoazobenzene, beta-naphthylamine, 4-nitrodiphenyl, N-nitrosodimethylamine, beta-propiolactone, methyl chloromethyl ether, alpha-naphthylamine, 4,4'-methylene-(bis)2-chloroaniline, and ethyleneimine.**

ACTION

- Workers interested in learning how to fight occupational health problems through using the tools that OSHA provides should consult some of the following materials:
 - * HOW TO USE OSHA: A Worker's Action Guide to the Occupational Safety And Health Administration, Urban Planning Aid, 639 Massachusetts Avenue, Cambridge, Mass. 02139.
 - * Stellman, Jeanne and Susan Daum, Work Is Dangerous To Your Health, Vintage Books, New York, 1973.
 - * Fowler, Bob, A Guidebook for Local Union and Safety Committees, Labor Occupational Health Program (address on cover).
 - * Cottine, Bert et al, Winning at the Occupational Safety and Health Review Commission. A Worker's Handbook on Enforcing Safety and Health Standards, Health Research Group, 1975 (address on back cover).
 - * O'Brien, Mary-Win and Joseph Page, Bitter Wages: The Nader Report on Occupational Health and Safety, Grossman, New York, 1973.
 - * Wallick, Frank, The American Worker: An Endangered Species, Ballantine Books, New York, 1972.
- Forms for filing an OSHA complaint and for requesting a NIOSH HEALTH HAZARD EVALUATION are included in Appendix B. We recommend that workers interested in filing complaints consult some of the books listed above, or that they consult some of the health and safety groups listed in Part E.
 - * Also listed in the Appendix are addresses of OSHA regional offices, from which workers can obtain the addresses of Area Offices to file complaints, and the address for NIOSH. (See Appendix C).
 - * If a state has taken over enforcement of occupational health and has its own "state plan", the worker must file her complaint with the regulatory body in that state, instead of with Federal OSHA. See Appendix A for states with approved "state plans."
 - * Addresses for filing complaints with the Division of Industrial Safety which administers the California State plan are in Appendix D.

CHAPTER 4

DO WOMEN WORKERS HAVE SPECIAL NEEDS?

Generally the kinds of work regarded as dangerous or unhealthy for women are equally dangerous for men. The old belief that women were more susceptible than men to occupational diseases, particularly skin disease and the effects of toxic chemicals, lacks any scientific foundation.

But there are obviously some physiological differences in the average woman compared to the average man. For example, the average woman is physically smaller than the average man and is only about two-thirds as strong.¹ In addition, women in general have lower red blood cell counts than men² and there is a higher incidence of anemia in pre-menopausal age women than in men of comparable age.³

A. WORK CAPABILITIES

Of these, the variability in strength has most often been used to prohibit women from certain jobs. But one cannot assume that just because a woman is small she is not capable of performing a job requiring heavy manual labor. Nor should it automatically be assumed that a very large person will be strong.*

Men and women should be treated on an individual basis, since some can lift heavy weights and some cannot. The EEOC has ruled that the ability to perform strenuous work must be determined on an individual basis, rather than on the basis of a stereotyped classification of women as the "weaker sex." The agency has ruled that jobs cannot be divided into "light" and "heavy" work, with women assigned to the light jobs.⁴ Courts have supported the EEOC position.

* In part this depends on the person's upbringing and experience. Women in the U.S. have traditionally not done as much manual labor or had as much athletic training as their male counterparts, although this is gradually changing. Increased strength can be achieved through training programs.

The need for limits on the amount of weight that can be lifted as well as for mechanical lifting devices to help workers is obvious. But this is not a need for women only. Men, too, need to be protected against back injuries. In fact, back injuries from manual lifting and carrying account for over one-quarter of all compensated industrial injuries in this country.⁵ Regulations (or restrictions) must protect ALL workers equally.

In some instances it may also be necessary for companies to make adjustments in machines or operations that are designed for the "normal male worker" so that the "average" anatomically smaller woman can work there safely. This might include using levers on machinery, lowering the height of work tables, re-adjusting guards, or insuring that protective clothing is designed to fit an anatomically smaller worker.⁶

In a recent settlement of a sex discrimination case at the C & H Refinery in Crockett, California, the company agreed to make equipment changes that would improve safety as well as open up jobs that had been closed to women because of weight-lifting requirements. Possible changes include mechanical pulleys and hoists, the use of buggies instead of barrels for dumping waste sugar, and the use of conveyor belts.⁷

B. MATERNITY AND DAY CARE POLICIES

Each year about 1 1/2 million working women in the U.S. have babies. (See Table) Although the mother may be working, in the majority of cases she still bears the primary responsibility for child care in this country. Thus, both good maternity leave policies and day care provisions are crucial for the physical and mental health of working women -- as well as for their equal employment opportunities.*

The way that employers treat pregnancy-related disabilities has been under attack in the nation's courts for several years. Cases involving pregnant school teachers, production workers and insurance workers are still wending their way through the judicial process. In these cases women workers are challenging employers' claims that disabilities and sicknesses relating to pregnancy (such as anemia, bleeding) are "voluntary" and therefore different than other temporary disabilities. The women are arguing that pregnancy-related disabilities should be included under sickness and disability insurance plans.¹

One important case dealing with this issue is now before the U.S. Supreme Court (*Wetzel v. Liberty Mutual Insurance Company*). A lower federal court had upheld 1972 EEOC guidelines stating that employees cannot be discriminated against because of pregnancy.² The Supreme Court will decide whether the EEOC guidelines will have the force of law.

* Unpaid short-term leaves (perhaps one or two years) -- without loss of seniority -- should ideally be available to either parent who wants to take time off of work to raise a child.

DAY CARE

Although 6 million pre-school children have mothers who work outside the home, there are still only 920,000 licensed day-care slots in the U.S.³ (This lack of day-care is also, of course, a serious problem to working fathers who are responsible for child-rearing or who share responsibilities with working mothers.)

The difficulties in finding day-care slots not only keeps a lot of workers out of the labor force, it also adds an additional mental and physical burden for those parents who are forced to balance the responsibilities of two full-time jobs: caring for their families and earning a wage.

Day care services are also particularly crucial at a time when the number of families with both parents working is on the rise. Moreover mothers are the sole support of over 2 million young children;⁴ the lack of day-care in a one-parent household can be a cause of mental stress and physical fatigue.

For years women's organizations and unions have been actively lobbying for adequate child care facilities. Congress recently passed a bill that would have provided \$125 million to upgrade day-care programs, but it was vetoed by President Ford in April 1976.

Many foreign countries provide both maternity leave and child care for their workers. In Europe child care is generally free or paid for on a sliding ~~income~~ scale. In the Soviet Union, facilities are often located in close proximity to the worksite.

ACTION

-- The Handbook for OCAW Women suggests that model maternity plan should cover

pregnancy under sickness and disability benefits; allow full reinstatement rights and accrual of seniority; allow a woman and her doctor to determine how long a leave is needed; grant leave to both married and single women; and have extended leave to care for a newborn child be optional for either a new mother or father without loss of seniority. The Handbook also contains a useful chart of varying state policies on maternity benefits.⁵

- Some unions have negotiated child care provisions in their contracts for all parents who want it, regardless of sex (e.g., AFT, ACWA). In the spring of 1976 the Amalgamated Clothing Workers opened their sixth day care center, administered jointly by union and management and paid for by employers' payroll contributions under their contracts.

C. PREGNANCY

BOTH men and women workers may be exposed to hazardous agents that can cause infertility or result in genetic damage which is passed on to their offspring, as will be explained in Part B of the Guide. But there are other risks that a worker may face when she becomes pregnant,* since some workplace exposures may adversely affect the health of a pregnant woman as well as the outcome of pregnancy.

Pregnancy can place a strain on certain body organs, such as the kidneys, heart, liver and pancreas.² It also causes an increase in back and foot problems, as a result of the woman's altering her posture to compensate for the additional weight. But each woman responds differently to her pregnancy and in most cases pregnancy may interfere very little, if at all, with the woman's ability to work.

EXPOSURE TO HAZARDOUS AGENTS DURING PREGNANCY

Thousands of chemicals are used in workplaces throughout this country. Although many of them have been tested to determine whether they cause acute (that is, immediate) effects on the body, few have been studied to see if they cause cancer, birth defects, or genetic defects. Even fewer have been studied to see if they can cause infertility, menstrual disorders or other disorders relating to reproduction.

-- Effects on the pregnant worker herself

The physiological demands of pregnancy on a woman's body may make her

* In a 1963 survey over half of all women having their first baby were employed during pregnancy, with 31% of all pregnant women employed during pregnancy.¹

more sensitive to health disorders of any sort,* and poisonous substances may affect the pregnant woman more than her non-pregnant co-worker.³ A 1975 HEW report by Vilma Hunt stated that certain normal physiological changes during pregnancy (such as altered blood volume and altered lung function) "must affect the maternal and fetal response to contaminants."⁴ According to one source, a pregnant woman may be more susceptible to upper respiratory illness "particularly if she works in an atmosphere containing viruses or irritating dusts."⁵

-- Effects on the fetus

The main way for hazardous substances to reach an unborn child is through the placenta. Scientists now believe that most chemical substances or drugs can cross this "barrier" (with varying degrees of ease) and enter the system of the developing fetus.⁶ Thus, many chemicals and drugs that enter a pregnant woman's body (through breathing, swallowing, absorption through the skin, etc.) will eventually get into the mother's blood circulation and find their way into the unborn child.⁷ (See Part C for specific dangerous chemicals)

* For example, detoxification mechanisms are altered (i.e. the ability of the liver to make substances "non-poisonous"), some metabolic processes change, and abnormal appetites and diets are common.⁸

No one can yet answer the important questions of exactly how much of a toxic substance that enters the mother's body will reach the fetus or what concentration the fetus can tolerate without harmful effects.⁹ How much of the drug or chemical reaches the fetus depends in part on the concentration that is reached in the mother's bloodstream. The mother's liver and kidneys will "detoxify" (make non-poisonous) and excrete some of the substances, but no one is sure exactly how fast this happens. Some chemicals are rapidly transported across the placenta. If this exchange occurs when the levels of the chemical in the mother's blood are high, then the developing fetus may be damaged in some way.¹⁰ Since the tissues of the fetus are rapidly developing, they are much more vulnerable to adverse effects than are adult tissues. Thus the fetus may be susceptible to poisonous substances even though the mother is not.¹¹

The fetus may be most vulnerable in the early weeks of pregnancy, but is also at risk later when in light of the potential harm of workplace exposures to both the pregnant woman and her developing fetus, it is very important for the woman to inform her employer of her pregnancy as soon as possible, so that any necessary temporary transfers to other departments may be quickly arranged. (See Chapter 5)

July 1942

STANDARDS FOR EMPLOYMENT OF MOTHERS
IN INDUSTRY

Pregnant women should not be employed in occupations involving exposure to toxic substances considered to be extra hazardous during pregnancy, such as:

Aniline.	Mercury and its compounds.
Benzol and toluol.	Nitrobenzol and other nitro compounds of benzol and its homologs.
Carbon disulphide.	Phosphorus.
Carbon monoxide.	Radioactive substances and X-rays.
Chlorinated hydrocarbons.	Turpentine.
Lead and its compounds.	
Other toxic substances that exert an injurious effect upon the blood forming organs, the liver, or the kidneys.	

Because these substances may exert a harmful influence upon the course of pregnancy, may lead to its premature termination, or may injure the fetus, the maintenance of air concentrations within the so-called "maximum permissible limits" of State codes, is not, in itself, sufficient assurance of a safe working condition for the pregnant woman. Pregnant women should be transferred from workrooms in which any of these substances are used or produced in any significant quantity.

Prepared by the Children's Bureau and the Women's Bureau of the U.S. Department of Labor, in conjunction with labor union women, New York State Department of Labor, National Institute of Health, and various obstetricians, 1942.

Source: Women in Industry by Anna Baetjer, 1946, pp. 190-191.

These recommendations to protect women workers are only now beginning to be considered -- nearly 35 years after they were drafted.

ACTION

- Read Vilma Hunt's report, Occupational Health Problems of Pregnant Women. It contains much information on the effects of toxic chemical exposures on pregnant women. It also contains a variety of suggestions on how government agencies (NIOSH, OSHA, FDA, etc.) could obtain more information on potential hazards for pregnant workers. (For a copy of the report, contact Clara Schiffer, Room 441 E, HEW, S. Portal Building, Washington, D.C. 20201)
- See Part E for specific ideas on how to be better informed about health and safety problems on the job and for the questions workers should ask their employers.

CHAPTER 5

RELATIONSHIP BETWEEN TITLE VII AND OSHA

A. DISCRIMINATION AGAINST WOMEN OF CHILD-BEARING AGE

As women move into non-traditional jobs or if they work on jobs that may be hazardous, they should keep two points in mind:

1. Title VII says that women are now legally eligible for virtually any job; and
2. OSHA states that all workers have the right to a safe and healthful workplace.

Considered jointly, these two laws require that:

JOBS BE OPEN FOR ALL WORKERS, REGARDLESS OF RACE OR SEX, AND THAT
JOBS BE SAFE FOR ALL WORKERS -- MEN AND WOMEN.

Neither law excludes pregnant women workers from coverage.

Nevertheless, as the case studies on page 40 of this GUIDE illustrate, some employers are refusing to hire women of child-bearing age (unless they can no longer bear children) -- instead of cleaning up the workplace so that everyone is protected. Since the majority of working women are in their child-bearing years, this policy is potentially devastating to women seeking employment -- particularly as more chemicals are discovered to be harmful and as more women seek non-traditional jobs.

(As the table on page 41 shows, over 1 1/2 million babies were born to working women in 1972 [out of 3 1/2 million babies born]):

CASE STUDIES OF JOB DISCRIMINATION AGAINST FERTILE WOMEN WORKERS

CASE 1 - LEAD EXPOSURE

Thirty-seven women at the Bunker Hill lead smelter in Idaho were recently informed that they could no longer work in lead operations at the smelter because of potential effects of this chemical on their future children. All of the women who were fertile were transferred to jobs that the company said were safer. But some of the new jobs pay less.¹

CASE 2 - FORMALDEHYDE EXPOSURE

A woman at a California fiberboard plant quit working in the second month of her pregnancy after her doctor advised that working with formaldehyde might harm her unborn baby. She had applied for a transfer or for disability benefits. The company successfully fought her efforts. All she received as compensation was unemployment -- at \$85 a week less than what her salary would have been had she continued working. After she had her baby, she returned to work.²

CASE 3 - RADIATION EXPOSURE

A female research technician in a thyroid laboratory of a health care facility learned that she was two months pregnant. Her job exposed her to doses of radiation that the AEC and OSHA considered safe. But her employer could not guarantee her that radiation exposure in the lab was safe for her fetus. When notified that the employee was pregnant, the employer requested the technician to take a maternity leave of absence without pay, or to resign. The technician chose to resign so that she could collect unemployment benefits and was treated as a 'new hire.'³

CASE 4 - LEAD EXPOSURE

According to the Detroit Free Press (April 15, 1975), a mother of four who was employed at a lead storage battery plant of General Motors of Canada, Ltd., had herself sterilized in order to keep her job. She was one of six women told they would have to prove they were no longer fertile in order to continue working with lead. The women have filed complaints with the Ontario Human Rights Commission, on the ground that the action is discriminatory. The newspaper story reported that the UAW was considering filing a grievance to protect the rights of the women workers.

CASE 5 - SMOKING

According to the San Francisco Chronicle (November 25, 1975), a woman working in an office with seven co-workers who smoked became pregnant, got sick and -- on the advice of her doctor -- requested a transfer away from the smoke. Her employer refused to transfer her and she quit. She had to file a legal action to win even unemployment benefits.

**Estimated Annual Births
Working Population 1972**

Central Age	Birth Rate per 1,000 Population 1/	Total Female Population 1971 2/	Annual Births (2)x(3)	Married Females Husband Present 2/	Married Female Workers Husband Present 2/	Estimated Annual Births Among Female Workers (4)x(6)x(5)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
17	66	7,547,000	498,102	866,000	320,000	184,056
22	167	8,754,000	1,461,918	4,842,000	2,276,000	687,180
27	140	7,051,000	987,140	5,466,000	2,102,000	379,614
32	75	5,903,000	442,725	4,831,000	2,004,000	183,652
37	36	5,825,000 3/	209,700	4,771,000 3/	2,270,000 3/	99,773
42	10	5,825,000 3/	58,250	4,771,000 3/	2,269,000 3/	27,703
47	1	6,089,000 3/	6,089	4,735,000 3/	2,317,000 3/	2,980
Total		74,580,000	3,663,924	45,443,000	18,530,000	1,564,988

1/ Table 56 Statistical Abstract (Table 65, American Almanac)

2/ Table B Special Labor Force Report 144, Bureau of Labor Statistics, U.S. Department of Labor.

3/ Data available only for two central age groups as follows: Col. (3) 11,650 for 35-44, 12,177 for 45-54 and Col. (5) 9,541 for 35-44 and 9,470 for 45-54, Col. (6) 4,539 for 35-44 and 4,634 for 45-54.

Married Women (Husband Present) in Labor Force March 1972 = 19,249 (Table 7, p. 36, Mo. Labor Rev., April 1973).

Discount for Lower Birth Rate Working Mothers . 9.

Estimated Annual Births $1,564,958 \times 19,249 \times .9 = 1,463,113$
18,330

July 17, 1973

Source: Appendix A, Decision of U.S. District Court for Eastern Virginia, Gilbert v. General Electric Company, reported in BNA Daily Labor Report, April 16, 1974, p. D-11. (Data compiled by G. E.)

B. OCCUPATIONAL HEALTH STANDARDS

OSHA standards are rules for workplace conditions. For chemical exposures, standards are "TLV's" (threshold limit values) -- the legal maximum concentration allowed in the air, averaged over an 8 hour workday. Some substances also have a "ceiling" value that should never be exceeded, even if other exposures during the day are within the TLV.

The Occupational Safety and Health Act requires that the Secretary of Labor, when adopting standards dealing with toxic materials or harmful physical agents, shall set the standard:

which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life.....

[SECTION 5]. (emphasis added)

It would seem apparent from this mandate that effects on the sexual functions and reproductive capacity of both male and female workers would be a legitimate and necessary consideration when setting standards.

In addition to the physical effects on reproductive health and fertility that may be caused by toxic chemicals, there may also be effects on the mental health of exposed workers. These possibilities were outlined in testimony presented in December 1975 to a committee of the California legislature:

It could hardly be denied that the progress of a pregnancy is inextricably intertwined with the emotional -- and even physical -- health of the parents-to-be. The least suspicion of birth defects or threatened miscarriage can precipitate psychological depression, emotional crises, and physical ailments in either or both the prospective parents. Thus, a regulatory standard designed to eliminate such risks ultimately serves to protect the health of working men and women, in strict accordance with the OSHA legislation.¹

Although a number of chemicals have been linked to birth defects, genetic defects, or miscarriages (e.g., lead, methylmercury, anesthetic gases, vinyl chloride), none of the 500 chemicals which have been regulated by OSHA have standards which incorporate protection against these effects. (Thousands of other chemicals used in the workplace do not have any at all.)

NIOSH

When developing Criteria Documents -- reports sent to OSHA with recommendations for new standards and workplace practices -- NIOSH should systematically check the scientific literature to determine if chemicals are known or suspected to cause genetic or birth defects. This has not always been done. The Carbon Monoxide Criteria Document, for example, does not mention the published evidence about possible biological effects of exposure for the pregnant woman or her fetus. And even the Lead Criteria Document does not mention the ability of lead to cause birth defects and miscarriages -- despite evidence about adverse effects of lead on reproduction dating back decades.*²

* See Vilma Hunt's Occupational Health Problems of Pregnant Women for other examples.

OSHA

When setting standards, OSHA should consider the possible effects on the developing fetus of an exposed pregnant worker or the genetic effects on either the man or woman which could affect the offspring. The agency can no longer avoid the need to develop a policy on setting standards for substances that may cause genetic or birth defects. Even in its proposed standard on lead exposure (October 3, 1975),³ where the agency itself spells out some of the adverse effects on the fetus of maternal exposure, OSHA only solicited comments on whether these effects "should be considered" when setting standards. (And it failed to mention any effects on the male reproductive system, as documented in Part C.)

In the cases where NIOSH has submitted evidence or warnings to OSHA on possible birth defects in offspring (for example, anesthetic gases and vinyl chloride) or chemicals which can cross the placenta (benzene), the agency still has not taken any steps to protect fertile workers and their children against these potential effects.

NUCLEAR REGULATORY COMMISSION

The only federal agency that has considered effects on the fetus in setting job health standards is the Nuclear Regulatory Commission. But its efforts (as can be seen below) to insure that pregnant workers will be protected from radiation exposure have been completely unsatisfactory.

In January 1975 the NRC proposed to implement the National Council on Radiation Protection's recommendation that special precautions be taken to protect the fetus of a pregnant worker who was exposed to radiation.⁴ The recommendation was based on studies showing an increased risk of leukemia and other cancers in children of mothers exposed to radiation during pregnancy.** These are the

** As an official of the U.S. Department of Labor pointed out, the reproductive capacity of male workers should also be considered.⁵

steps the NRC^{*} took:

1. The NRC considered the legality of mandatory pregnancy testing for workers, but decided that it might be an invasion of privacy.⁶

2. The agency considered setting a special standard to cover just fertile women. But the EEOC said that a separate standard for men and women workers would constitute sex discrimination.⁷

3. It considered setting a stricter standard that would protect everyone -- fertile men and women. But it decided that "reduction of the dose limits for all radiation workers in order to avoid discrimination against women does not appear practicable. Such a reduction in the dose limits would cost the nuclear industry large sums of money....." (emphasis added).⁸

4. As a result, it merely developed a set of "instructional guidelines"⁹ for pregnant workers, which do not require the employer to provide a safe workplace or guarantee the woman job protections. For example, the guidelines state: "You could delay having children until you are no longer working in an area where the radiation to your unborn baby would exceed 0.5 rem [the National Council's recommendation]."⁹ (emphasis added)

Or perhaps pregnant women might choose this alternative: "If you do become pregnant, you could ask your employer to reassign you to areas involving less exposure to radiation. If this is not possible, you might consider leaving your job....." (emphasis added)

The economic and health consequences to a pregnant woman faced with the alternatives offered her by the Nuclear Regulatory Commission are obvious. She has the "choice" of losing her job -- or endangering her baby. In other words, poverty or health: an impossible choice.

*Formerly the AEC (Atomic Energy Commission)

C. THE NEED FOR OCCUPATIONAL HEALTH POLICIES THAT ARE NOT DISCRIMINATORY

The kinds of work regarded as dangerous or healthy for women are equally dangerous or healthy for men -- with the exception of certain exposures once the woman becomes pregnant. Thus new occupational health standards should not be developed on the sex-based classifications that have marred "protective" labor legislation in the past, where women have been protected but the same protections have not been extended to men. Standards should be developed to protect all workers who are exposed to hazards, regardless of their sex. Exposure to toxic substances should be kept under harmful levels in all circumstances, as is required by the Occupational Safety and Health Act.

When considering hazards affecting reproduction, women workers are not the sole victims. It takes a man and a woman to make a baby and toxic chemicals don't discriminate. The male reproductive system can also be damaged:

- Some of the men who manufactured the pesticide Kepone at a small plant in Virginia are now believed to be sterile.¹
- Foreign studies show that an unusually high number of male workers have abnormal sperm tests after lead exposure.²
- Female operating room personnel exposed to anesthetic gases suffer an increased rate of miscarriages and children with birth defects, but children of male operating room personnel also show an increased risk of birth defects.³
- Women whose husbands were exposed to vinyl chloride have an unusually high incidence of stillbirths and miscarriages.⁴

Prior to conception, exposure to certain substances may cause mutations in the germ cells of either male and female workers, possibly resulting in birth defects, cancer, or other health problems in their children. In light of this evidence, a one-sided approach which protects only fertile women is discrimina-

tory: women don't get jobs and men don't get protection.

The only reasonable policy is to have occupational health standards stringent enough to protect fertile men and women workers -- as well as their developing children -- against job health hazards.

For additional information on the invalidity of OSHA standards that are aimed solely at women workers -- or just at pregnant workers -- the reader is referred to the excerpted testimony of Erica Black Grubb in Appendix E.*

* Testimony before the Assembly Labor Relations Committee, California Legislature, Hearing on the Problems of Working Women, December 8, 1975, San Francisco.

D. PROTECTION FOR THE PREGNANT WORKER

It is clear that there will be a long, hard struggle before government agencies and industry adopt non-discriminatory standards to protect reproductive functions in both male and female workers. Workers and their representatives will have to fight hard to insure all workers the right to a safe job.

What can a woman do today when she is exposed on her job to a substance that is known or suspected to cause birth defects, miscarriages, or prematurity? Too often her only choice is between her baby's health and her job security.

Until all workers are sufficiently protected against harm to themselves and their offspring, there are certain methods that industry must use to protect the pregnant woman. Some of these were spelled out in an EEOC decision concerning two employers who effectively forced radiation workers to resign when they became pregnant (by not transferring them and by denying sick leave and maternity benefits). (See Case # 3 , p.40)

According to the EEOC, less discriminatory alternatives would have included:

- A TRANSFER TO ANOTHER JOB IN THE SAME DEPARTMENT.
- A TRANSFER TO ANOTHER JOB IN A DIFFERENT DEPARTMENT.
- ALLOWING USE OF SICK LEAVE AND MATERNITY BENEFITS.
- LEAVE OF ABSENCE WITHOUT SACRIFICING SENIORITY BENEFITS, AND EQUAL PAY UPON RETURN.¹

According to the EEOC, an employer's refusal to offer the pregnant worker the option of a transfer to a safer job or to offer maternity benefits or sick pay are discriminatory under Title VII.²

Until occupational health standards are stringent enough to protect the developing fetus, the woman worker -- at the very least -- should be informed by her employer about the potential effects of hazardous chemicals on the fetus. And she should be given the opportunity to transfer to another job during pregnancy without loss of pay, seniority, or other benefits. If the worker must temporarily leave work, she should be able to ~~return~~ to her former job after childbirth with seniority and all her other benefits.

E. EXPERIENCE IN FOREIGN COUNTRIES

In the United States unionized workers can bargain for transfers to safer jobs during pregnancy. But since most women do not belong to labor unions, they have to risk job security in order to insure their baby's health.

In many foreign countries, on the other hand, transfer during pregnancy is an automatic right. Most European countries have had policies dealing with the employment of pregnant women workers for years. In some countries this right was guaranteed as early as 1907.¹

A great deal of research has been done on occupational health hazards of pregnant women in foreign countries, particularly in Eastern Europe and the USSR. One of the difficulties in doing research on the hazards for pregnant women is that much of the scientific literature is written in Central or Eastern European languages.

Lessons for equal employment policies can certainly be learned from some of the experiences of these foreign countries. Although many of the countries prohibit the employment of women at certain hazardous jobs -- as is again being proposed by employers in this country -- there is one very basic difference in the economic systems of these countries and that of the United States. In most of the foreign countries described below, there is little unemployment. Women are guaranteed jobs at equal pay if the government does not want them to face risks on a certain job during pregnancy or while they are breast-feeding. They do not have to suffer economic deprivation and unemployment in order to insure their health and that of their baby.

The German Democratic Republic has requirements for maximum weights and prohibited occupations for pregnant women and nursing mothers.²

When factory women become pregnant in the Soviet Union, the policy is to immediately transfer them to safer parts of the plant where they will not be exposed to toxic substances. The women continue to receive their same salary after the transfer. All women workers get 112 days of maternity leave -- 8 weeks before and 8 weeks after delivery. Moreover, a woman can remain at home for one year without pay after she has a baby and can then return to her job without loss of seniority or pension rights.³

The Soviet Union also forbids the employment of women in certain jobs and with certain chemicals. For example, women cannot work with lead, benzene, or around coke ovens. Women are also not generally allowed to work with chrome, nickel, tar, or in metal casting operations.⁴ (In addition to the concern for pregnant women workers, the U.S.S.R. appears also to be concerned about the fertility of male workers. The Chief of the Industrial Toxicology Laboratory at the Institute for Industrial Hygiene and Occupational Diseases reports that several chemicals tested in her laboratory -- chloroprene, ethylene oxide, and dimethyl dioxide -- have been found to affect the male reproductive system.⁵)

In Poland, under standards laid down in the 1974 Labor Code, maternity leave is 16 weeks for the first child; this leave can be followed by a three-year (unpaid) leave during which all the job rights are maintained, together with benefits. Also, with the approval of a doctor, pregnant women can be immediately moved to lighter work without any loss of wages.⁶

In Sweden women are also immediately transferred to lighter or safer jobs during pregnancy, without loss of pay or seniority.⁷

As long as the United States is a country that falls short of full and equal employment, the exclusion of women from certain jobs — instead of making the workplace safer for everyone — cannot be justified. In countries where such exclusion is allowed, women are not forced to choose between health or poverty.

— PART B —

HOW YOUR JOB CAN AFFECT YOUR HEALTH

CHAPTER 6

HOW HAZARDS CAN AFFECT YOUR BODY

Most hazardous materials in the workplace enter the body by being inhaled (breathed in), although some chemicals such as benzene or organic (tetraethyl) lead compounds can be absorbed through the skin. Still others may affect the skin directly, producing rashes (dermatitis) or disease. Eating contaminated food is another way poisons may enter the body.

Once a substance comes in contact with the body it may cause local or systemic effects:

- a local effect means that the action of the chemical takes place at the point of contact. For example, sulfuric acid may come in contact with the skin or eyes and cause a burn -- a local response. A solvent may touch the skin and cause it to dry, crack, or blister. Or silica breathed into the lungs can produce a disabling lung disease called silicosis.
- a systemic effect means the action of the chemical is someplace other than the point of contact. For example, some pesticides are absorbed through the skin (point of contact), but affect the nervous system (site of action). Vinyl chloride may enter the lungs (point of contact) but can cause cancer of the liver (site of action).

The duration of exposure and the length of time for the effects of exposure (disease) to occur are also important in understanding effects of hazardous materials.

Some chemicals cause an acute reaction, that is, effects are seen after a short exposure to the material -- usually at a fairly high concentration.

For example:

- Carbon monoxide may cause symptoms ranging from dizziness to coma after short exposures to high concentrations.
- Lye will cause skin burns almost immediately upon contact.

Chronic diseases or effects take a longer time to appear and usually involve exposure to much lower concentrations of the substance involved, as well as a longer period of exposure (usually many years).

For example:

- Lung diseases, such as asbestosis, silicosis, and black lung disease may not show up for years after initial exposure to the material (asbestos, silica and coal dust, respectively).
- Cancer is a chronic disease which may show up years after exposure to benzidine, asbestos, vinyl chloride, or other carcinogens.

The acute and chronic effects of many of the chemicals to which workers are exposed are described in detail in a variety of books and pamphlets. Some of these books are hard for workers to obtain; others are technical and extremely difficult for lay people to understand.

The best non-technical reference for workers to consult to learn about the hazards of their job and how to monitor the workplace for the presence of hazards is WORK IS DANGEROUS TO YOUR HEALTH by Jeanne Stellman and Susan Daum. It is published by Vintage Books in paperback and is available in many book stores. (If you are unable to find it, you can obtain a copy from the Health and Safety Office, Oil Chemical and Atomic Workers International Union, P.O. Box 2812, Denver, Colorado 80201 . \$1.95; special prices for union members.)

CHAPTER 7

SIMPLE EXPLANATIONS OF COMPLEX SUBJECTS

The following pages focus on chemical and physical agents that are "mutagens," "carcinogens," and "teratogens." These are discussed in detail because:

- they can have devastating effects on the exposed person,
- they may affect the exposed person's ability to reproduce,
- they may affect the outcome of pregnancy,
- they may affect the health of the developing child; and
- they may affect the health and well-being of future generations.

The GLOSSARY on the next page is provided to assist readers in understanding the explanations of these effects. It should be used while reading the remaining sections of Part B.

A. GLOSSARY

<u>Birth defect</u>	an abnormality in an infant that may be seen at birth (such as hip dislocation or cleft palate) or detected at some point after birth (such as mental retardation or heart abnormalities).
<u>Carcinogens</u>	substances or agents which can cause cancer (an abnormal cell growth which can spread).
<u>Chromosome</u>	part of the cell's genetic material
<u>Congenital</u>	present at birth
<u>Embryo*</u>	an unborn child from conception through 12 weeks
<u>Embryotoxic</u>	something which is toxic to the embryo; may cause a slowdown in growth (perhaps leading to birth defects) or death (miscarriage or stillbirth); may or may not also be dangerous to the pregnant woman.
<u>Fetus*</u>	an unborn child from 12 weeks until delivery
<u>Genetic defect</u>	an abnormality in the genetic material of cells (the genes or the chromosomes).
<u>Genetic material</u>	the hereditary units of living cells, made up of genes. Genes regulate the cell's activity and are combined into strands called chromosomes. The genetic material determines what characteristics children will inherit from their parents.
<u>Germ cell</u>	the egg or sperm cell containing reproductive material which determines the characteristics that will be inherited by the young from its parents.
<u>Mutagens</u>	substances or agents which can cause mutations or changes in the genetic material of living cells
<u>Mutation</u>	a change (usually harmful) in the genetic material of a cell. When it occurs in the germ cell, the mutation can be passed on to future generations.
<u>Placenta</u>	an organ which connects the embryo to the mother's uterus; it transfers food and oxygen and sometimes other substances from the mother's bloodstream.
<u>Somatic cell</u>	all the cells of the body, other than the germ cells
<u>Teratogens</u>	substances or agents which can cause birth or other abnormalities in offspring
<u>Toxic</u>	causing adverse health effects to a particular organ or body system
<u>Trimester</u>	a 3 month period (during pregnancy)

* In this report the word "fetus" has usually been used to indicate either the developing fetus or embryo.

B. WHAT IS A "MUTAGEN"?

Most cells of the body are continually growing, reproducing, and dying. The new cells take the place of the old cells. The genetic material within the cells influences every process in the body; it also divides and is reproduced in these new cells.

A mutagen is a chemical or other agent that can cause a change (mutation) in the genetic material of living cells. Most mutations are harmful,¹ although the harm may not be visibly apparent. Often these mutations may result in death of the individual cell. Sometimes they may cause abnormal cell division, which can result in cancer (unchecked growth and multiplication of cells) or altered functioning of the cells (e.g., sickle cell anemia).²

Mutations can also occur in germ cells (the sperm or egg). Only mutations in germ cells can be passed on to offspring. It is important to understand that UP TO CONCEPTION A MUTAGEN MAY AFFECT EITHER THE MALE SPERM OR FEMALE EGG CELLS.

If a germ cell (egg or sperm) with a mutation is fertilized, the mutation may result in death of the fetus before birth (spontaneous miscarriage). Or, if it survives, it may develop into a fetus with a genetic defect in all of its cells. This may result in mental retardation, congenital defects, or other physical or mental abnormalities in the child. If the infant survives, the defect may be passed on to all of its children.³

Mutations can be caused in living organisms by a wide variety of environmental agents, including X-rays and chemicals, such as certain solvents and pesticides. It is not known to what extent the rate of mutations in human cells may be increased by exposure to these agents.^{4,5} Twenty-five percent

of the diseases in this country may have some genetic origins ⁶ and that chromosome aberrations are found in 30% of spontaneous miscarriages.⁷

As more is learned, many substances which are found to be mutagenic also are found to be cancer-causing. Thus, exposure to a mutagenic agent may result in unchecked somatic cell growth (cancer) in the persons exposed; or it may leave them healthy but damage their germ cells so that any children they conceive may be abnormal or have birth defects. Harmful mutations can "induce lethal effects; mutations are known to be responsible for physical abnormalities, and to play a major role in the causation of mental deficiency and mental diseases."⁸

C. WHAT IS A "CARCINOGEN"?

Carcinogens are chemicals or other agents that can induce or promote cancer. Cancer is an uncontrolled ("wild") growth of cells in the body, commonly called a tumor. These growths can disrupt body functions and destroy whole organs. They may spread to other parts of the body (e.g., by way of the bloodstream or lymph system).

Because many types of cancer are difficult to treat, cancer is often fatal. It is the second most common cause of death in this country. Scientists know very little about exactly how or why cancer develops.

Cancer experts estimate that as many as 80-90% of all human cancers are associated with exposure to environmental agents, such as food additives, drugs, radiation, industrial chemicals, and smoking.⁹ Many food additives that cause cancer are prohibited from the food supply. But many industrial chemicals have never been tested to see if they are cancer-causing. Some others that have already been linked to cancer are still used without any controls at all.

OSHA has special regulations for only 16 of the chemicals that are known to cause cancer.*

Unborn children may also be at risk, since many chemicals can cross the placenta and reach the fetus. Evidence of a transplacental carcinogen first developed in 1971, when a study showed that many mothers who took the drug DES during pregnancy (to prevent miscarriage) had daughters who developed cancer of the vagina or cervix when they were teenagers.¹⁰

For both adults and children, the length of time between exposure to a carcinogen and the appearance of cancer is quite long -- it may range from 5 to 40 years.¹¹ Thus, people exposed to carcinogenic chemicals or drugs may be lulled into a false sense of safety.

Scientists do not know a way to determine what is a safe level of exposure to a carcinogen.¹² Since even short exposures to some carcinogens have caused cancer deaths, the only protection is to use a safer substitute or be sure that the work environment is strictly controlled to eliminate exposure.

D. WHAT IS A "TERATOGEN"?

From conception until birth, the fetus may be exposed by way of the placenta to substances that are present in the mother's bloodstream. Some of these substances are essential to the fetus (e.g., nutrition and oxygen); others may be harmful to the fetus -- even if the exposed mother is unharmed.

* Vinyl chloride, asbestos, and the list on page A-28.

A teratogen is a chemical or other agent that interferes in some way with the development of the fetus after conception. The resulting abnormal development may cause miscarriage. Or if the fetus survives, it may develop defects that will be visible at birth (e.g., missing limbs or cleft palate) or defects that will not be noticeable for some time after birth (such as learning disorders, lack of coordination, or hormonal imbalance).¹³

About 4-7% of all newborn babies have some kind of serious congenital defect.^{14*} Many more have defects that are not immediately recognized. Over 12% of all stillborn babies have been found to have malformations.¹⁵ No one is sure to what extent these defects are caused by exposure of the mother to teratogens or mutagens.

How does a terotogen harm the fetus? No one is exactly sure. It may cause changes in the growing cells of the fetus, resulting in abnormal growth. Or it may kill one or more of the rapidly developing cells in the fetus. Since these cells could be in the process of developing into organs or limbs, the result could be permanent structural deformities.¹⁶

Research shows that the fetus is uniquely susceptible to the action of certain chemicals and viruses at very specific stages during pregnancy. The period during pregnancy when the fetus is most susceptible to structural birth defects is thought to be approximately from day 18 after conception to day 60. (Other disorders can be caused at later stages of pregnancy.)¹⁷

Thalidomide is an example of a terotogen that caused drastic structural deformities in the children of women who took the sedative during early pregnancy. Thousands of babies were born with shortered, deformed, or missing arms and legs as a result of the mother's taking the drug. Pregnant women exposed to

* One third of the beds in children's hospitals today are occupied by congenitally defective individuals, and congenital disease is the third most common cause of death in the newborn.

X-Rays or German measles have also had mentally retarded babies or ones with birth defects.¹⁸ With Thalidomide, almost all mothers who took the drug during the 20th to 35th days after conception had babies with deformities.¹⁹

Thus, the kind of effect caused by a terotogen depends on the dose (in particular, how much reaches the fetus) and the stage of pregnancy when exposure occurs. During the first few weeks after conception, exposure to a terotogen may result in death of the fetus (causing miscarriage). The first trimester is a very critical stage of pregnancy since structural damage to the fetus may occur at that time. (Miscarriage can also result). During the last trimester, most body structures have completed development, but growth continues and specialized development of the organ functions is not yet completed. A terotogen may damage functioning of the organs at this time.²⁰

E. WHAT ARE "EPIDEMIOLOGICAL STUDIES," "ANIMAL TESTS," "CYTOGENETIC STUDIES," AND "BACTERIAL TESTS"?

A variety of animal, bacteria, and human studies are done to detect carcinogens, mutagens, and terotogens. These will not be described in detail here, but some are briefly explained to acquaint the reader with the concepts of how tests can be done.

"EPIDEMIOLOGICAL STUDIES"

-- OF EXPOSED WORKERS OR CONSUMERS

These are studies of populations to try to detect disease patterns and to determine what factors are involved in causing illness. Human studies of

environmental effects generally involve comparing groups of people exposed to a particular drug or chemical with groups not exposed to see if there is a difference in disease patterns.

Or a group of people with a particular disease can be studied to see if they all have been exposed to the same agent.

- Workers exposed to vinyl chloride may be compared with workers who don't work with vinyl chloride to see which group has the higher incidence of cancer; or
- Workers from different plants who all have the same disease (for example, mesothelioma--a rare kind of cancer) can be studied to see if they are all exposed to the same substance (asbestos).

-- OF THEIR OFFSPRING

Although some comprehensive studies are now being carried out to detect chemicals that cause cancer in workers, few efforts have been made to link occupational exposures to birth defects in offspring.* At the present time, the occupation of the mother is not even recorded on the birth certificate of a newborn baby or the death certificate of a stillborn baby.²¹

- In one of the few studies of its kind, operating room personnel who were exposed to anesthetic gases were compared with a control group of non-exposed workers to see if the exposed female workers or the wives of male workers had a greater number of stillbirths or babies with birth defects. (See Part C for a discussion of the survey.)

Studies can also look at children with birth defects or cancer and go backwards to determine if their parents had common exposures.

- A study of children in a Canadian province who died of cancer before age 5 revealed that many of their fathers had jobs where they were exposed to hydrocarbons (mechanics, painters, mechinists, etc.).²²
- Studying unexpected cases of vaginal and cervical cancer in teenage women led to the discovery that their mothers had all taken DES during pregnancy.

* See Vilma Hunt's report to HEW for a thorough discussion on the inadequacies of government efforts to systematically study this problem.

"ANIMAL STUDIES"^{23, 24}

Animals (e.g., rats, mice, hamsters) can be exposed to chemicals for varying periods of time at varying exposures. The animals are then studied to see whether or not an unusually high number of them develop cancer or other diseases over their lifetime when compared to a "control" group of animals (a group that is not exposed).

- Animals can be exposed to a particular chemical and be allowed to mate and reproduce. Several generations of animals are then studied for the number of stillbirths, deformities, etc. and compared to offspring from a non-exposed group. These effects could be the result of teratogens or mutagens.
- Male animals can be exposed to suspected mutagens and then be mated with unexposed females. If significantly more of the fetuses are dead or deformed as compared with controls, this may provide evidence that the chemical is a mutagen.
- Female animals may be exposed to a chemical when they are pregnant. Their offspring are studied to see if there are any abnormalities, cancer, or teratogenic effects, including an abnormally high death rate. These results are compared to a control group.
- Several other kinds of animal studies are performed, but they are too complicated to explain here.

Human and animal studies are very important in the detection of chemical carcinogens, mutagens, and teratogens. But they have certain limitations.

- Human studies generally pinpoint only carcinogens that cause unusual types of cancer.* For example, vinyl chloride was linked to angiosarcoma of the liver in exposed workers because that type of liver cancer is so rare. If vinyl chloride caused lung cancer, the association would not have been noted as readily.
- The long latency period (after exposure to a carcinogen and before the cancer appears) makes detective work in humans difficult. It is hard to determine, for example, exactly what the mother of a 20 year-old woman who develops cancer may have been exposed to during her pregnancy.
- Human studies can be conducted only after there are already cancer victims.
- Animal studies usually take 2-3 years.

* And only teratogens that cause unusual, visible birth defects (such as Thalidomide).

-- If there is "no effect" seen in animals exposed to a carcinogen, it does not necessarily mean that the substance is "safe." As an example, if a carcinogen that causes cancer in one out of 100 animals (a 1% effect) is tested on a group of 50 animals, no cancer cases may be apparent -- even though exposure to a carcinogen which caused cancer in 1% of the human population would be devastating.²⁵

"CYTOGENETIC STUDIES"

These are studies of germ or somatic cell mutations in exposed animals or somatic cell mutations in humans. Cells (generally blood or bone marrow) are observed under the electron microscope to detect chromosome aberrations which may indicate exposure to a mutagen.²⁶

"IN VITRO" TESTS

Studying the risks of cancer and mutations involves statistical problems. Trying to estimate the possible risk of an environmental agent to millions of people is difficult with a small number of animals. If a toxic effect does not show up in the animals, there is no assurance that problems will not appear in a much larger number of humans.

Since genetic material is the same in all living organisms, one way to look at millions of living organisms at one time is to study organisms simpler than the mammal -- such as bacteria. A billion bacteria, for example, can be examined in a 3 square inch area in a laboratory, whereas a billion animals in an experiment would be overwhelming.

One of the recent findings in the field of cancer is that almost every chemical which has been demonstrated to cause cancer in man or animals has been

found to cause changes (mutations) in the genetic material of some bacteria (which is the same as human genetic material).

This discovery has led Dr. Bruce Ames and his colleagues at the University of California, Berkeley, to devise a simple, inexpensive screening test for mutagens using Salmonella bacteria. The test takes only a few days, costs only a few hundred dollars per chemical tested, and is very sensitive.²⁷

Of 175 chemicals known to cause cancer in humans or animals which were tested in his system, 90% were found to cause mutations in the bacteria. Only 10% of a selected 108 chemicals that are known to not cause cancer in man or animals caused mutations in the bacterial system.²⁸ Thus, the test may be a good early predictor for chemicals that can cause cancer (with an error rate of about only 10%.)

The Salmonella screening test is a good start on the road to determining which environmental agents are mutagenic or carcinogenic and should be used alongside animal studies. It would be particularly useful for manufacturers and research chemists in making early, practical decisions before chemicals are developed for mass marketing.

On the basis of his research, Ames concludes that most human cancer and genetic defects may be initiated by environmental mutagens and that: "The best solution is prevention: identifying environmental mutagens and minimizing human exposures." ²⁹

ARE TESTS THAT ARE NOT DONE ON HUMANS VALID?

The National Cancer Institute is currently testing 350 chemicals in laboratory animals, mainly mice, rats, and hamsters, to see if they cause cancer. A May 19, 1976 press release from the NCI explained why scientists cannot wait for human evidence of cancer to appear before acting to control exposure to chemicals:

... It is often difficult to associate cancer in humans with a specific chemical because people usually are exposed to many chemicals at the same time. In addition, the time for people to develop cancer after exposure is long, often 15 to 20 years. Thus awaiting human evidence for the identification of a carcinogen might result in a long exposure of many people and in the potential induction of many cancers before exposure is restricted.

Through direct observation of humans, scientists have identified approximately 30 carcinogens, such as vinyl chloride, bis(chloromethyl) ether, and tobacco smoke. Animals treated with these substances, with arsenic a possible exception, also develop cancer. In view of the difficulties in detecting carcinogenic chemicals by epidemiologic means, results from animal tests must be used to warn of potential human hazard.³⁰
[emphasis added]

Likewise, an expert in birth defects recently surveyed all the currently available methods to assess human risk of birth defects from exposure to teratogens. He concluded that:

Although more effective methods for the early detection of adverse effects on development will doubtless be devised, there must be continued reliance on animal tests.³¹

We cannot in good conscience continue to use this country's workers and consumers to screen new compounds to see if they cause mutations, cancer, or birth defects. We must use the tools that are currently available to us as predictors -- screening tests on bacterial systems and thorough, long-term animal studies.

ACTION

- Read PREVENTING OCCUPATIONAL CANCER, a pamphlet available from Labor Occupational Health Program, address on cover.
- Read CANCER PREVENTION AND THE DELANEY CLAUSE, a Health Research Group pamphlet which describes the way in which food additives are supposed to be regulated and which explains the need for testing chemicals in animals before testing them on workers and consumers. Address on cover.

-- PART C --

HOW YOUR JOB MAY AFFECT YOUR
ABILITY TO HAVE HEALTHY CHILDREN

CHAPTER 3

WAYS THE DEVELOPING FETUS OR CHILD CAN BE HARMED

As is evident from Part B, there are a variety of ways in which the substances to which a worker is exposed can adversely affect his or her children. This section of the Guide will consider a number of chemical and physical agents and will demonstrate that the ability of men and women to have normal, healthy children can be harmed by exposures on the job.

The various ways in which hazards can interfere with the reproductive process are listed below. (Also see chart on page C4 for chronology of effects on fetus.) Most of these have been described in greater detail in earlier chapters.

The effects of exposure to certain chemical, physical, and biological hazards include:

1. Menstrual disorders in the woman
2. Interference with sexual functions, such as loss of libido (sex drive) in the male or difficulty with erection during intercourse.
3. Lowered fertility -- a decreased ability of the man to produce sperm or of the woman to produce eggs; or production of defective sperm or eggs.
4. Genetic damage in the egg or sperm cells (before conception) which can be passed on to the developing fetus. If the fertilized egg survives, disease or birth defects can result.
5. Difficulties in conceiving a child, e.g., by interference with the ability of the sperm to fertilize the egg.
6. Damage to the fetus during pregnancy. Once conception has occurred, the developing fetus is extremely susceptible to damage by certain viruses, chemicals, drugs and radiation. Many of these

can cross the placenta and enter the bloodstream of the fetus. Depending on the stage of pregnancy, there may be no effect on the fetus, the fetus may be killed, or the fetus may live but suffer birth defects.

7. Damage to the mother during pregnancy. Factors which may not have a certain toxic effect on the nonpregnant woman may have more far-reaching effects in a pregnant woman due to the added physiological demands of pregnancy. This could conceivably interfere with the pregnancy.
8. Toxic effects on the newborn, developing child if the mother is breastfeeding while exposed to the hazard
9. Problems with the healthy development of the newborn or developing child, if the child is exposed to job hazards brought home on the workclothes of parents.

There are estimates that 4 - 7% of all children (perhaps 250,000 a year) are born with some type of defect.² Some of these defects (such as mental retardation and abnormal sexual development) may not be discovered until some time after birth.

The chart below indicates the most common birth defects in the United States.³ No one is certain what percentage of these can be attributed

Prevalence of Common Birth Defects in the United States*

Defect	Number Under Age 20†
Mental retardation of prenatal origin	1,170,000‡
Congenital blindness and lesser visual impairment	300,000¶
Congenital deafness and lesser hearing impairment	300,000
Genito-urinary malformations	300,000
Muscular dystrophy	200,000
Congenital heart and other circulatory disease	200,000
Clubfoot	120,000
Cleft lip and/or cleft palate	100,000
Diabetes	80,000
Spina bifida and/or hydrocephaly	60,000
Congenital dislocation of the hip	40,000
Malformations of the digestive system	20,000
Speech disturbances of prenatal origin	12,000
Cystic fibrosis	10,000

SOURCE: THE NATIONAL FOUNDATION - MARCH OF DIMES

to each of the major known causes of birth defects: hereditary (genetic transmission, chromosome aberrations); environmental (radiation, drugs, chemicals, viruses, maternal diet, etc.)⁴; or to direct toxicity (such as lack of oxygen).

Congenital birth defects are one of the leading causes of deaths⁵ among preschool-age and elementary-school-age children. The economic cost to society of these birth defects, and of the cancer and other diseases that are caused by mutagens and teratogens, is tremendous. But the cost in suffering for the affected person and family is even greater.

* * *

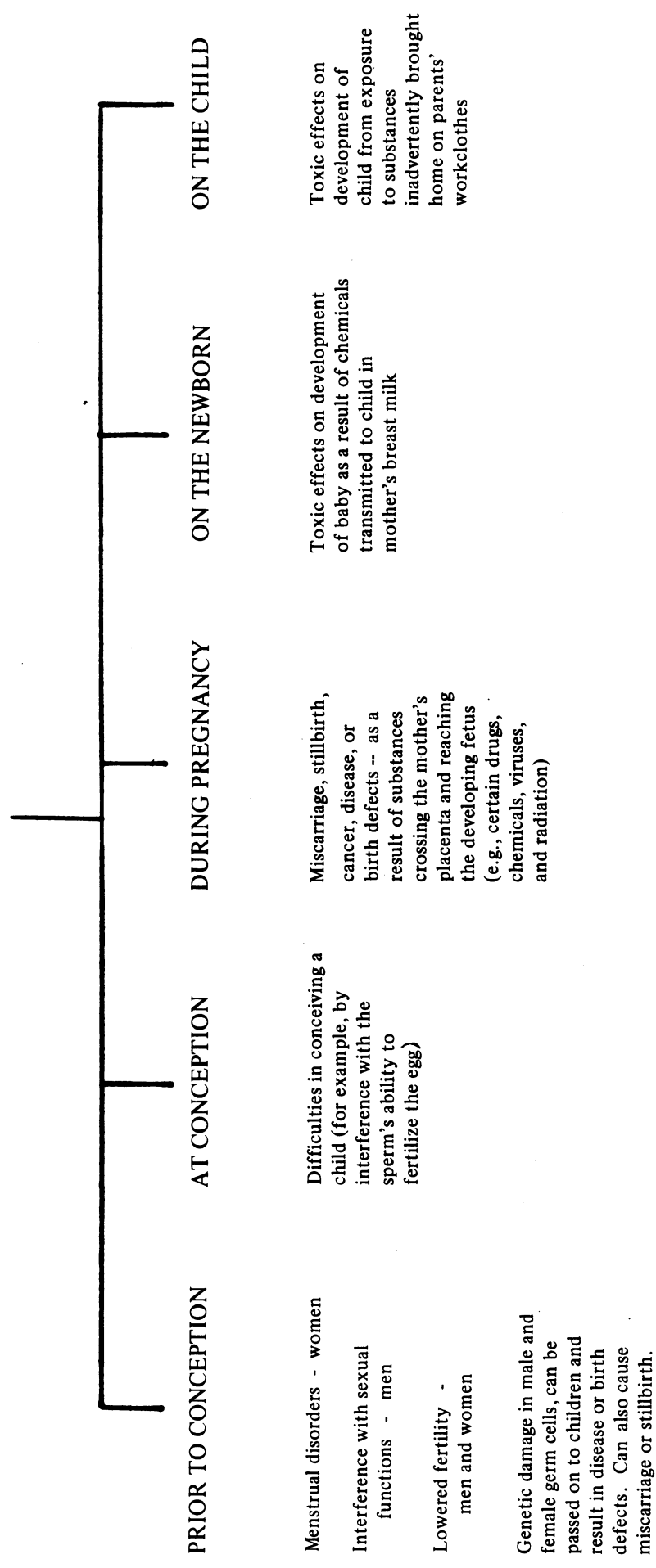
The chapters which follow do not cover all of the chemical and physical agents known to cause reproductive problems, nor do they represent an exhaustive search of the literature for studies of mutagenic and teratogenic effects. Information is presented on the effects of selected widely-used industrial materials which have been well-documented as causing cancer or adverse effects on the outcome of pregnancy.

The adequacy of OSHA standards is not discussed within each of these chapters; readers are referred to other books such as Work is Dangerous to Your Health for information about the occupational Threshold Limit Values (TLV's). But readers should realize that, with the exception of occupational exposure to vinyl chloride, none of the OSHA standards for the hazards described in Part C reflect that the chemicals can cause cancer, or that they may cause genetic damage, cross the placenta, cause birth defects, or be present in the breast milk of mothers who are exposed.

Thus, the current TLV's for most of these substances do not insure that workers will be protected against cancer or these reproductive effects.

NIOSH (in its recommendations to OSHA) for new standards and OSHA (in its standards-setting process) can no longer avoid thorough consideration of these effects on workers or their developing children. Standards must be set which guarantee that male and female workers will not be harmed by their job exposures -- and that their ability to bear normal, healthy children will not be threatened.

CHRONOLOGY OF POTENTIAL ADVERSE EFFECTS OF
JOB EXPOSURES ON REPRODUCTION OR
ON THE ABILITY TO HAVE NORMAL,
HEALTHY CHILDREN



CHAPTER 9

LEAD

Properties and Uses: Lead is a heavy, soft, blue-grey metal that can be pressed and shaped into a variety of products. Metallic lead is used in pipes, tanks and roofing, as an alloy with tin and antimony it is used as type in the printing industry, for cable coverings and accumulator plates and as a solder with tin.

Lead compounds (inorganic) are used in paints, varnishes, pigments and pesticides and in the pottery, rubber and storage battery industries. The most commonly used organic lead compound is tetraethyl lead, added to gasoline as an anti-knock compound.

Acute Effects: Lead is a cumulative poison, so its primary effects are chronic. Children often suffer acute effects of lead poisoning.

Chronic Effects: Once lead is in the body, it goes into the blood and is transported throughout the body. Certain organs or parts of the body are more sensitive to lead than others. At first, a worker may just feel tired or be constipated. Later, stomach cramps which simulate the symptoms of either appendicitis or ulcers may appear. This condition is called "lead colic." Lead can affect red blood cells and cause anemia. Lead can produce problems with the nervous system in two ways: by causing a loss of function of the nerves, producing a paralysis, or by affecting the brain (seen more commonly in children than adults). Lead can also seriously damage the kidneys.

REPRODUCTIVE EFFECTS

Lead is perhaps the most well-publicized cause of reproductive problems in exposed women workers. The historical literature observed that women exposed to high lead levels suffered high rates of miscarriage -- and as a result, women have traditionally been kept out of the lead industries in the

United States (as well as in many foreign countries). Only in the past 10 years or so have women started working with lead again.

But studies indicate that male workers are also at risk. And evidence about male fertility problems after lead exposure is not new; some case reports date back to the turn of the century.¹ Lead-exposed workers are known to suffer from sperm abnormalities. Thus, the emphasis on hazards of lead for women of child-bearing age is too one-sided. Fertility problems and problems with the healthy development of the fetus can also be related to male exposure.

Furthermore, there is some evidence that either male or female workers may suffer genetic damage from exposure to lead, since chromosome aberrations have been found to occur after lead exposure.² Other studies of chromosome aberrations, however, have shown conflicting results.³

STUDIES IN MALE WORKERS

Reports show that male workers who suffer from chronic lead poisoning may have decreased libido (sexual drive). Atrophy (degeneration) of the testes has also been observed following prolonged, chronic lead poisoning.⁴

A recent study (October, 1975) showed alterations in sperm among workers exposed to lead at a storage battery plant in Rumania.⁵ Over 90% of a group of workers with blood lead levels over 75 ug % (micrograms of lead per 100 milliliters of blood) had at least one abnormal sperm test. But even some workers with lead levels as low as 30-50 ug % showed decreased fertility, loss of libido, or decreased ability to produce healthy sperm.

An earlier case report suggests that lead poisoning of the father can adversely affect the development of the fetus. A woman who had had several normal children bore three children with malformations while her husband had lead poisoning. (The children died.) After her husband recovered, she had two normal pregnancies.^{6, 7}

In 1934, Dr. Alice Hamilton stated that she believed, on the basis of an earlier Japanese study, that the male germ cells could be affected by lead. In the study, women whose husbands were exposed to lead had nearly twice as many child-less marriages as would have been expected.^{8, 9}

STUDIES IN WOMEN WORKERS

Lead absorbed into the bloodstream of pregnant women can cross the placenta and enter the blood of the fetus.¹⁰ Some studies have even shown concentrations of lead in the fetus that are higher than those found in the mothers.¹¹

In 1900 a study of women workers revealed a combined miscarriage and stillbirth rate that was three times higher among women working with lead than for those not exposed.¹² And a 1957 Japanese study showed that women exposed to lead had twice as many miscarriages as women not exposed.¹³ In fact, the effects of lead in producing miscarriage are so well-known that some women have actually used lead to try to get rid of unwanted pregnancies.¹⁴

Women workers handling lead have also been found to suffer from menstrual disorders. In addition, lead has been found in the fetal tissues other than blood and is secreted in the breast milk.¹⁵

Recent animal studies suggest that lead is a teratogen.

For example, relatively high levels of lead injected into hamsters during pregnancy resulted in malformations in the newborns.¹⁶

Early studies showing stillbirths and miscarriages after lead exposure were mostly based on high levels of exposure to lead. But more recent studies show that low levels of exposure may also cause harm to the rapidly developing fetus or child. Rats fed a diet with low levels of lead had offspring that were underweight;¹⁷ lambs prenatally exposed to maternal blood with relatively low lead levels had impaired learning and performed more poorly on tests on visual discrimination when they were 10-15 months old.¹⁸

If a woman exposed to lead breast-feeds, her child will be exposed to lead. Mother rats fed lead in their diets while nursing (and not while pregnant) had young with faulty growth and nervous disorders, including paralysis.¹⁹ The lead reached the infant solely through the mother's milk.

In addition, the increased amount of anemia seen in pregnancy makes any further anemia caused by lead poisoning in a pregnant worker even more serious.²⁰

DIRECT EXPOSURE OF CHILDREN TO LEAD FROM WORKCLOTHES

Children have also suffered the direct effects of lead poisoning as a result of their parents' bringing lead-contaminated clothes home. This phenomenon had earlier been seen following exposure to asbestos and beryllium transported from factory to home on work clothing. Out of 102 children of lead smelter workers in Tennessee, fifty had excessive lead absorption,

presumably from their parents' clothing since the levels were higher than those of other children in the community.²¹

Children who develop lead poisoning are more likely to be left with permanent brain damage.²² Chronic effects of lead poisoning in children can often show up as "hyperactivity" in school -- children have short attention spans, don't do very well in school, or are easily distracted, among other more severe disturbances.²³

CHAPTER 10

ANESTHETIC GASES

Properties and Uses: Anesthetic gases are used to put people to sleep so that surgery can be performed. The types of gases range from nitrous oxide, fluroxane, methoxyflurane, halothane, to ethrane.

Toxic Effects: Since these substances are used as anesthetics, one obvious effect is on the nervous system: headache, dizziness, and sleep. In operating room situations, it is important that the exhaled gas be evacuated from the room and that the operating room personnel do not breathe these waste gases.

There are also recent studies in which certain patients who have been anesthetized once have developed serious or fatal cases of hepatitis after being anesthetized the second time. This has only been reported in patients and not workers; however, the possibility of such happening to workers exists and is only another reason that there should be complete exhausting of the used gas.

CANCER AND REPRODUCTIVE EFFECTS

Anesthetic gases, unless carefully controlled, routinely escape into the operating room (o.r.) during their administration to patients and can also leak from equipment. Operating room personnel can thus have constant exposure to the gases, unlike the higher, short-term exposures that patients receive.

Foreign studies (USSR--1967, Denmark--1970) have revealed unusually high miscarriage rates among nurse-anesthetists studied in those countries.^{1, 2} A 1968 U.S. study of deaths among anesthesiologists revealed a higher than expected number of cancer cases.³ And a 1973 survey by Corbett of female nurse-anesthetists in Michigan found a three-fold excess number of birth defects in mothers who continued to work in the o.r. during pregnancy than those who left the o.r. during that period.⁴

These studies prompted a committee of the American Society of Anesthesiologists (ASA) to conduct a nationwide study of operating room personnel, sponsored by NIOSH, the National Institute for Occupational Safety and Health. The ASA sent out questionnaires (see Part E, Chapter 28, for a copy) to virtually all of the doctors, nurses, and technicians who regularly work in operating rooms of U.S. hospitals. Other nurses and physicians who do not work in o.r.'s were surveyed for comparison (as a "control" group).

The study revealed that women who work in operating rooms run an increased risk of miscarriage, birth defects among their children, cancer, and both liver and kidney disease. Studies of male operating room personnel did not find an increased risk of cancer, but did find excess liver disease. The study of male workers also revealed that their wives had an unusually high number of babies with birth defects.⁵

The results on cancer and reproductive problems found in this study are outlined below:

MISCARRIAGES

*Risk for female physician anesthetists, nurse anesthetists, and/or nurses and technicians: 1 1/3 to 2 times that of medical personnel not exposed to anesthetic gases.

BIRTH DEFECTS

*Risk for female physician anesthetists: 2 times that of unexposed hospital personnel.

*Risk for wives of exposed male physician anesthetists: 1 1/4 times that of unexposed medical personnel.

CANCER

*Risk for exposed female personnel: 1 1/3 to 2 times that of unexposed medical personnel.

The ASA Committee concluded that anesthetic gases (as opposed to other potential hazards in hospitals such as viruses and x-ray exposures) are the most reasonable explanation for the disease rates and reproductive problems that have been seen in operating room personnel.⁶

Two other recent studies also show reproductive problems in o.r. personnel. The ASA Committee surveyed dental surgeons who had anesthetic gas exposures exceeding three hours a week and found an increase of miscarriages among their wives.⁷ (Dental nurse-anesthetists and dental assistants are obviously also exposed.)

An English study published in December 1975 also found an increase in miscarriages among female operating room personnel, although not in the wives of exposed male personnel as had been seen in the ASA studies. The same study found that the frequency of certain birth defects in children of exposed fathers was higher than in the non-exposed group.⁸

MISCARRIAGES (Dentist Study)

*The risk of miscarriage for wives of exposed dentists was 1 3/4 times that of unexposed dentists.

MISCARRIAGES (English Study)

*The risk of miscarriage for female operating room personnel was 1 1/2 to nearly 3 times higher than in non-exposed medical personnel.

BIRTH DEFECTS (English Study)

*The risk of certain birth defects in children of exposed male operating room personnel was 1 1/3 times that of unexposed medical personnel.

In addition to the recent human evidence, some animal studies dating back years support the conclusion that anesthetic gases may be at blame for the increased disease rates and reproductive problems in o.r. personnel. For example, rats exposed to halothane for 12 hours at various stages during pregnancy had offspring with rib and backbone deformities.⁹ Increased fetal death rates, birth defects, and retarded growth have been seen in both mammals and developing chicks after anesthetic gas exposure (with a variety of different gases).¹⁰

Despite their wide use, anesthetic gases have never been systematically surveyed to determine their cancer-causing properties.¹¹

PROTECTION

Scavenging devices can remove much of the gas from the air in operating rooms. Adequate scavenging equipment can cut down the levels by 85-90% of what they currently are.¹² But not all scavenging systems are equally effective and hospitals should continue to monitor the air for levels of gases even after the systems have been installed. Monitoring could detect accidental gas leaks in equipment.

The ASA committee reports that the typical operating room contains halothane in the ranges of 10 ppm and nitrous oxide in the range of 600 ppm. After scavenging, these values are reduced 10 fold -- to 1 ppm for halothane and 60 ppm for nitrous oxide. In 1974 costs of installing necessary

scavenging devices were under \$200¹³ -- a fraction of the cost to society of even one baby with a birth defect, and virtually nothing compared to the multi-million dollar budgets of most hospitals with surgery capabilities.

Particularly when operating rooms don't have scavenging systems, o.r. nurses should demand transfers to safer departments of the hospital during pregnancy (at equal pay, without loss of seniority or other benefits).

CHAPTER 11

VINYL CHLORIDE

Properties and Uses: Vinyl chloride is a colorless gas at room temperatures; it has a pleasant odor. Called a monomer (one molecule), vinyl chloride can be combined with other vinyl chloride monomers and other materials to form a polymer (many molecules), poly-vinyl chloride, in a process called polymerization. Polyvinyl chloride (PVC) is one of the most commonly used plastics.

Workers may be exposed to vinyl chloride monomer (vcm) in the production of vinyl chloride, polyvinyl chloride, or in the manufacture of plastic products (such as bottles and film for meatwrapping). Additional exposures may occur to workers exposed when PVC is decomposed by fire or heat -- e.g., firemen. Consumers and workers who use aerosols on their job may have been exposed in the past since vinyl chloride used to be used as an aerosol propellant. It is now banned for that use.

Acute Effects: It can cause headache, dizziness, and drunkenness; however, any of these effects means the worker is exposed massively beyond the current OSHA standard.

Chronic Effects: The chronic effects are much more serious. Chronic exposure can cause liver damage, as well as angiosarcoma -- a rare form of liver cancer. It can also cause acroosteolysis -- clubbing and swelling of the hands and feet due to effects on the skin and bones. It has also been associated with a higher rate of lung and brain cancer and in reproductive problems, as described below.

CANCER AND REPRODUCTIVE EFFECTS

Recent studies of plastics workers exposed to vinyl chloride have revealed a marked increased risk of angiosarcoma of the liver.¹ They also suggest that exposure to vinyl chloride (vcm) may heighten the risk of lung cancer, cancer of the blood-forming tissues, and cancer of the brain and central nervous system.^{2, 3}

But there are other concerns about exposure to vinyl chloride. There is evidence that parental exposure to vcm can affect offspring in two ways -- by exposure of the male, causing a mutagenic effect (by affecting the genetic material in the sperm) or by exposure of the female, causing a teratogenic effect (cancer in the offspring).

In the past two years, several reports have shown that vcm is a mutagen in the bacterial test system. This was first demonstrated by a 1974 Swedish study;⁴ other labs have since found the same results.

Studies have also shown that PVC polymerization workers exposed to vcm have an excess of chromosome aberrations.^{5, 6} Studies in four countries have reported these findings.⁷

Several recent reports suggest that the genetic changes in bacteria and in the abnormalities in human cells observed in the laboratory may in fact indicate real genetic risks from vinyl chloride exposure. In one study, Dr. Irving Selikoff of Mt. Sinai Hospital in New York City looked at wives of vcm workers⁸ and found miscarriage rates that "appear to have been higher than expected."⁹

Another recent report (April 3, 1976) suggests that vinyl chloride can cause genetic effects in workers and affect the outcome of their wives' pregnancies. The women studied were found to have a higher rate of miscarriages and stillbirths after their husbands began working with vinyl chloride than before the men were exposed. Also, the women whose husbands had worked with vcm had a marked increase of miscarriages and stillbirths when compared to a group of women whose husbands were not exposed to vinyl chloride.¹⁰ The authors concluded that "the increased fetal mortality among wives of workers

subsequent to vcm exposure now raises serious scientific and public health concern for the possible genetic risk of vinyl chloride to man."¹¹

Fear about birth defects after maternal exposure to vinyl chloride during pregnancy stems from studies of Dr. Cesare Maltoni of Bologna, Italy. In 1974, Dr. Maltoni discovered that exposure of pregnant rats to vcm produced angiosarcoma of the liver in their offspring.^{12, 13} His findings led NIOSH to recommend that women not be employed in vcm operations, although OSHA did not act on the recommendation.¹⁴

Thus, exposure to vcm has been associated with cancer in the offspring of exposed pregnant animals, with cancer and chromosome aberrations in exposed workers, and with a higher than expected miscarriage and stillbirth rate among wives of exposed workers.

CHAPTER 12

ORGANIC SOLVENTS

Solvents are materials that dissolve other things. Soap and water is a type of solvent. To dissolve industrial materials (paints, grease, oil, etc.), stronger solvents are used—generally organic solvents. Organic solvents are so-called because they are based on carbon, a component of all living (organic) matter. Most organic solvents have some basic similarities. Some are highly flammable and many are volatile (evaporate quickly). They make you feel dizzy and cause headaches, and in high enough concentrations may cause you to pass out (narcotic effect). They cause dermatitis (reddening, cracking of skin). Solvents can be broken down into groups with similar chemical properties. Two groups of solvents (aromatics and chlorinated hydrocarbons) will be discussed in the following section.

AROMATICS: This group includes benzene, toluene and xylene. Toluene has narcotic effects, but does not seem to harm the blood in the way benzene does. It may cause impaired judgement and reflexes. Xylene is similar to toluene but is a stronger irritant.

BENZENE is a colorless, flammable liquid with a characteristic sweet odor. It is manufactured in petrochemical plants and distilled from coal gas and coke-oven gas.

Properties and Uses: Uses of benzene include: manufacture of styrene, phenol, nylon intermediates and some synthetic detergents. As a solvent, benzene is used in degreasing operations, in paint strippers and rubber cements, and is often used in laboratory work. Toluene, considered a "safer" solvent, is often substituted for benzene. However, it is often contaminated with benzene.

Acute Effects: Like most organic solvents, benzene acts on the nervous system causing dizziness, headache, confusion, giddiness, and nausea. If exposure to high concentrations continues, unconsciousness, convulsions, and death can result. Benzene can cause cracking and reddening of the skin.

Chronic Effects: The major toxic effect is damage to the bone marrow, the body's blood factory. The results of this damage can be: anemia, a shortage of red blood cells; leukopenia, a shortage of white blood cells and thrombocytopenia, a shortage of platelets, which are necessary for blood clotting. Benzene has also been linked to leukemia in approximately two hundred workers, and to aplastic anemia -- destruction of the bone marrow cells that produce red blood cells.

CHLORINATED HYDROCARBONS: These are used as degreasers and in dry cleaning as well as being used as general solvents. Some typical ones are these: Methylene chloride irritates the eyes and causes dizziness. It is converted by the body to carbon monoxide (CO). Trichloroethylene (TCE) has a strong narcotic effect. It can also damage the liver and kidneys. Recent evidence suggests it causes cancer. Perchloroethylene acts similarly to TCE but tests to see if it causes cancer are not yet completed. Chloroform, toxic to the liver and kidneys, was formerly used as an anesthetic gas. It is also an irritant of the eyes, nose and mouth. Recent evidence suggests it causes cancer. It has been used in a variety of consumer products, including toothpastes and cough medicines. Following a consumer lawsuit, the federal government has proposed a ban on this consumer use; the ban should go into effect in June 1976. Carbon tetrachloride is extremely toxic to the liver and kidneys as well as producing a narcotic effect. Evidence of its cancer-causing properties are well documented.

CANCER AND REPRODUCTIVE EFFECTS

BENZENE, TOLUENE, AND XYLENE

As noted above, benzene has been associated with the development of aplastic anemia and leukemia in many workers.*

* Alarmed by reports of leukemia among workers who use benzene in manufacturing a plastic food wrap, the United Rubber Workers Union recently asked OSHA for a stricter occupational health standard on benzene.¹

There are also several case reports where benzene exposure associated with pregnancy has resulted in the sudden onset of aplastic anemia in workers. It appears that the stress of pregnancy somehow produces this effect. In one of these cases, the woman had a normal blood count prior to becoming pregnant and her exposure to benzene had ceased two years before she became pregnant.²

Because there have never been any careful studies to determine whether there is an increased rate of birth defects or miscarriages among women exposed to benzene, there is cause for concern. Benzene can cross the placenta and enter the blood stream of the fetus and the chemical has been shown to cause birth defects in mice.³ Also, since examination of the bone marrow cells in workers exposed to benzene has shown damaged chromosomes⁴, there is an added possibility of adverse effects on the fetus.

Combinations of the aromatics -- benzene, toluene and xylene -- have been associated with menstrual disturbances, with the most frequent complaint being more prolonged and intense bleeding than normal.⁵ Since commercial toluene and xylene have been known to be contaminated with benzene, it is unclear which of the chemicals may have caused the menstrual difficulties. Changes in menstrual function have also been reported in a Russian study of women exposed to xylene and toluene.⁶

Exposure to toluene has also been associated with a slight increase in chromosome breaks in human blood cells.⁷ Xylene has been shown to cause

birth defects in chicks.⁸

CHLORINATED HYDROCARBONS

Many of the chlorinated hydrocarbons, including trichloroethylene, chloroform and carbon tetrachloride, have been shown to cause cancer in animals.^{11, 12}

Animal studies have also shown that carbon tetrachloride can pass through the placenta and damage the liver of the fetus.¹³ Carbon tetrachloride has also been shown in animals to interfere with the normal hormone function of the testes and cause infertility.¹⁴ Chloroform has been shown to be "quite embryotoxic" in rat studies (that is, it killed the embryos of pregnant rats).¹⁵

Methylene chloride has been detected in the fetuses of mothers occupationally exposed. It has also been detected in the maternal breast milk 5 - 7 hours after start of the work shift and has remained detectable for more than 17 hours after work.¹⁶

OTHER HUMAN STUDIES

A German study showed that pregnant workers exposed to dimethylformamide (DMF) at a synthetic fiber plant had a higher miscarriage rate than did workers not exposed to DMF.¹⁷ Some animal studies have also shown that DMF can kill the embryos of pregnant rats.^{18, 19} A Czechoslovakian study of one kind of spinal birth defect seen in that country revealed that in 6 cases out of 9 the mothers had been exposed to some chemical during pregnancy. Five of the six chemicals were organic solvents, including xylene, acetone, trichloroethylene, methylchloride,

and petrol (gasoline). The author suggests that additional studies should be done, especially in countries where many women are employed in industries using organic solvents.²⁰

CHAPTER 13

ESTROGENS

Properties and Uses: Estrogens are chemicals that are found naturally in the human body, but they can also be manufactured synthetically or extracted from animal urine for use as medicines (e.g., for birth control pills or for therapy during menopause). Diethylstilbesterol (DES) is a well-known synthetic estrogen that has been used as a "morning-after" contraceptive pill, as therapy to allegedly prevent miscarriages, and as a "fattener" for cattle and chickens.

EFFECTS ON WORKERS AND THEIR CHILDREN

Both female and male workers engaged in the production of estrogens or estrogen-based drugs and DES pellets and pastes -- as well as those who have administered DES to animals -- have been found to suffer adverse health effects.^{1, 2}

Estrogen may be absorbed through the skin, inhaled, or swallowed while being handled during production. Exposure occurs at many times during the production process, including during extraction from urine and during tablet-making.³

In FEMALE WORKERS, excessive exposure results in heavier and more frequent menstrual bleeding, and sometimes results in irregular bleeding after menopause.^{4, 5}

MALE WORKERS exposed to high levels of estrogens can develop sore and enlarged breasts and become sexually impotent.⁶ At one DES-manufacturing plant in Tennessee that was surveyed by NIOSH (under a Health Hazard Evaluation request), 23 instances of breast disease had occurred among male workers between 1969 and 1973.⁷

CHILDREN of both male and female workers have been contaminated by estrogen dusts carried home by parents on their clothing. This has resulted in sore and enlarged breasts in boys and girls who have not yet reached puberty.⁸

All of these abnormalities disappear when exposure to the estrogen stops.

Occupational estrogen exposure of pregnant women can be dangerous to their unborn children. Male children of women who are exposed while pregnant may be born with enlarged breasts and female children may begin puberty early.⁹

CANCER AND BIRTH DEFECTS - DRUGS WITH ESTROGEN

But there are more serious consequences of exposure to estrogens during pregnancy. Vaginal and cervical cancer have appeared in over 100 teenage daughters¹⁰ ("DES daughters") of mothers who took DES during pregnancy thinking it would prevent miscarriage.* This evidence suggests that DES is a trans-placental carcinogen -- a cancer-causing substance that can cross the placenta and cause cancer in offspring.^{11, 12}

A recent study shows that male children of mothers who took DES during pregnancy may also be affected. Of 42 "DES sons," 4 developed cysts near the testes, 3 had shrunken testes, and two had abnormalities of the penis.¹³

Another recent study compared mothers of babies born with arm or leg deformities with mothers of normal babies. Three times as many of the mothers

* Several groups have been actively working for strict controls over the use of DES. Two of the most active are the Health Research Group (address on inside cover) and the Coalition for the Medical Rights of Women, 433 Turk Street, San Francisco, CA 94102. The Coalition has an informational pamphlet for "DES Daughters."

of babies with birth defects had taken estrogens during pregnancy compared to mothers of normal children. Some of the women had continued to take oral contraceptives after becoming pregnant (thus continuing their estrogen exposure), had been taking estrogen in hopes of preventing miscarriage, or had been given a hormone-based pregnancy test.¹⁴ Similar results were seen in an English study.¹⁵

Recent evidence also shows that prolonged use of estrogen by women who have passed menopause is associated with the marked increase of risk of cancer of the endometrium (cancer of the inside of the uterus or womb).¹⁶

Thus, estrogens are teratogenic as well as carcinogenic. Although no studies of birth defects or cancer in children of occupationally exposed women have been conducted, the potential hazard to workers who handle or make these products is so great that close observation and study are desperately needed.

CHAPTER 14

IONIZING RADIATION

Properties and Uses: When x-rays, gamma rays, alpha or beta particles pass through matter they excite the atoms (building blocks of all matter), changing them into electrically charged particles or ions -- so these forms of radiation are called ionizing.

Doctors, nurses, x-ray technicians, dentists, laboratory workers, foundry inspectors, and atomic workers are at risk of exposure. Other occupations where radiation may be used, particularly for inspection purposes, are too extensive to be listed here.

Effects: The effects of radiation depend on dose, type of radiation, and sensitivity of various organs to the particular radiation. Some of the body changes seen with high level radiation are: decreased concentration of red and white blood cells and platelets, mouth ulcers, decrease in appetite, diarrhea, stomach bleeding and breakdown of the small intestine, disruption of bone marrow and interference with growing bones (children especially), skin ulcers, loss of hair, lung edema (filling with fluid), diminished kidney function, cancer (especially leukemia), and death. Low level radiation can cause cancer and genetic damage.

CANCER AND REPRODUCTIVE EFFECTS

There have been numerous epidemiological studies done on groups of people with considerable exposure to ionizing radiation. Radiologists and patients treated with X-Rays for arthritis of the back have shown an increased incidence of leukemia years after their radiation exposure.¹ Children irradiated over the middle of the chest for enlarged thymus glands have shown a marked increase of thyroid cancer about 20 years after the X-Rays were given.²

Children whose mothers received radiation while pregnant have also shown an increase in leukemia as well as other cancers.³ Radium, uranium and plutonium are radioactive substances that emit ionizing radiation.

Women who worked with radium paint in the 1920's were found to have an increased incidence of cancer later in life. (see p. A-4). There is also a dramatic increase in lung cancer among uranium miners⁴ and plutonium is one of the most potent cancer-causing substances known.⁵

Recent evidence has shown that many workers have been exposed to plutonium and that in the first group of plutonium workers autopsied as part of an AEC program, there was an almost two-fold increase of cancer. Almost all of the cancer victims had been exposed to levels of plutonium that are supposedly "safe" for workers in the plutonium industry.⁶ For at least 9 years, workers who inhaled plutonium have been "treated" with a drug that has not been cleared by the Food and Drug Administration for use in humans in the aerosol form (the form used).⁷

Both animal and bacterial studies show that radiation has the capability of harming the genetic material of the cell, causing mutations. These mutations can be lethal to the cell or can be passed on for generations.⁸

The fetus is also sensitive to the effects of radiation. The potential for harm from radiation exposure is greater for growing individuals (whose cells have to undergo rapid division to support growth) than for adults. The most sensitive stage of all is during the development of the fetus.⁹ Irradiation of the mother immediately prior to conception or at the time of conception results in a high incidence of prenatal death.¹⁰

Radiation can also cause the growth of the uterus to slow down so that a normal pregnancy is difficult.¹¹

In 1907, seven years after discovery of X-rays, an animal study demonstrated that newborn rabbits, exposed to X-rays during pregnancy, had cataracts and eye defects.¹² About 20 years later, children whose mothers had received therapeutic X-Rays during pregnancy were found to have serious defects. Most had small heads and brains and would never develop into

normal, healthy children.¹³

Other studies in the 1950's showed an increased incidence of mentally retarded and small-headed children in mothers exposed to radiation between the 7th and 15th weeks of pregnancy.¹⁴ Studies of the bomb victims in Hiroshima and Nagasaki have also shown that radiation to the fetus during early pregnancy may result in reduced growth and mental retardation.¹⁵ These children also have a greater chance of developing cancer or leukemia.¹⁶

Ionizing radiation can also have a harmful effect upon the fertility of both men and women. A study of Japanese radiological technicians showed that they had a higher sterility rate than was seen in the general populations.¹⁷

Radiation can kill both the sperm production cells of the male testes or the egg production cells of the female ovary. Although they are more sensitive to radiation than the testes, the ovaries are somewhat protected from radiation by their anatomical position deep within the body. But radiation can still kill the egg production cells of a woman and can also destroy the normal functions of the ovary. This can result in a cessation of the normal hormone-producing function and can result in an "early" menopause.¹⁸

Under current occupational health standards, workers are allowed a total body dose of 5 rems* of radiation per year. An ever increasing awareness of the more subtle, long-term health effects of radiation has caused a continual lowering of the acceptable dose. Since 1940, the permissible whole-body dose for workers has been lowered five-fold.¹⁹ As better evidence develops, it will undoubtedly become clearer that the 5 rem dose does not protect workers.

* rem - one unit of measurement of radiation exposure

Women workers who are pregnant should avoid radiation exposure due to the potential effects on the fetus. The National Council on Radiation Protection has recommended a maximum limit of 0.5 rems of exposure to the fetus during the entire pregnancy.²⁰ (See p. A44-45 for a discussion of the Nuclear Regulatory Commission guidelines).

Readers interested in further information on radiation can obtain a copy of the Health Research Group report: A Consumer's Guide to Avoiding Unnecessary Radiation Exposure. (Address on cover)

CHAPTER 15

PESTICIDES

Since these chemicals were formulated for their ability to kill pests, one would assume that they could possibly cause serious harm to humans or other mammals that might come in contact with them. Workers and consumers who handle these compounds, whether in the manufacturing processes, in the application, or through harvesting, selling, or eating contaminated foods, are all at risk.

There are several ways to classify pesticides: either by the target: insecticides, rodenticides, herbicides, or fungicides; or by their chemical composition: chlorinated hydrocarbons, organophosphate esters, and dithiocarbamates.¹

Chlorinated hydrocarbons

The most common ones are:

Aldrin	Benzene Hexachloride	Chlordane
DDT	Dieldrin	Endrin
Heptachlor	Kepone	Lindane
Methoxychlor	Terpene polychlorinates	Toxaphene

Although this class is not as acutely toxic as the organophosphates, some of the pesticides do have acute effects. If large amounts are inhaled, ingested, or in contact with the body for prolonged periods, nervous system problems like nervous excitement, seizures, tremors, and even death can be seen. The tragic example of Kepone illustrates what can happen.

At a Kepone manufacturing plant in Virginia, more than half of the 113 employees and former employees of the plant developed symptoms of Kepone poisoning characterized by: visual disturbances, loss of weight, tremors ("shakes"), insomnia, pain in the chest and stomach, and, in some cases, infertility and loss of libido (sex drive).²

Some of these compounds have been banned by the Environmental Protection Agency for their cancer-causing potential or their effects on the environment (such as aldrin, dieldrin, DDT).

The chlorinated hydrocarbons can also cause skin irritation and rashes.

They can also be transmitted from mother to child through the breast milk.

Organophosphate esters

Chlorthion	DDVP	Demeton (systox)
Diazinon	Dimethoate	Ekatin
EPN	Ethion	Guthion
HETP	Malathion	Methyl parathion
OMPA	Parathion	Phosdrin
TEDP	TEPP	Trithion

These pesticides are the compounds from which World War II nerve poisons were derived. The pesticides can enter the body by inhalation, ingestion, or absorption through the skin. The effects immediately after exposure can mimic the symptoms of flu or cold. More extensive exposures can cause vomiting, dizziness, tremors, and seizures. Massive exposures can be fatal.

Workers who are exposed to these substances for long periods of time may suffer from increased drowsiness, ringing in the ears, tingling of the skin, dizziness, irritability and depression -- effects on the nervous system.

Organophosphates are also called "anticholinesterase" inhibitors because they interfere with a very important chemical reaction in the body that allows the nerves to work properly. Blood tests to determine what percentage of the cholinesterase has been "poisoned" (inhibited) should be routinely done to insure that workers are not overexposed. Protective measures should be used to prevent worker exposure to dusts, mists, or liquid pesticides.

Dithiocarbamates

Some of the more common ones include:

Baygon	Carbaryl (Sevin)	Isolan	Pyrolan	Zectran
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These are used as both insecticides and fungicides. They are also irritants to the skin, mouth, nose, and throat. Some can cause similar effects as the organophosphates because they are also anticholinesterase inhibitors; but they are not as potent.

CANCER AND REPRODUCTIVE EFFECTS

There have been no adequately controlled human studies of agricultural workers to determine their risk of developing cancer from exposure to pesticides.³ Nor have there been any studies of miscarriages or birth defects in exposed workers. Thus, we must rely on animal and bacterial studies.

Few animal studies have demonstrated birth defects in offspring after exposure to pesticides, but the reason for these results must be examined. For a variety of reasons, many of the animal studies conducted in the past on pesticides have been inadequate -- too few animals have been studied, only one species has been examined, sufficient doses have not been used, etc.⁴

Some of the pesticides are very species-specific in their effects, that is, they cause death of the embryos in rats, but not in mice, rabbits or guinea pigs.⁵ Dieldrin can prevent conception from occurring in female animals.⁶ One study showed that chlordane-treated pregnant rats had a higher number of litters that did not survive when compared to animals not exposed to the pesticide.⁷

Some pesticides do cause defective offspring in animals. Carbaryl produces abnormal offspring in guinea pigs; Thiram produces abnormal offspring in hamsters; while Captan causes abnormal offspring in rabbits and mice. PCNB, folpet, 2,4,5-T and 2,4-D all cause a high percentage of abnormal offspring in exposed mice.⁸ Questions about whether or not 2,4,5-T and 2,4-D have caused birth defects in children in areas that were heavily defoliated by herbicides (such as Vietnam) are still unresolved.⁹

Pesticides from all three major groups discussed earlier in this chapter have been implicated in the development of cancer in test animals: the chlorinated hydrocarbons (aldrin, dieldrin, DDT, Kepone, and Lindane), and the organophosphate esters (Diazinon, Dimethoate, and Dipterex) and carbamates and Thiourea compounds (dithiocarbamates, MBC, ethylene thiourea). Other inorganic pesticides, such as sodium arsenate, have been shown to cause leukemia both in pregnant mice and their offspring.¹⁰

All pesticides are mixed with some other substances as a carrier or propellant. In the past vinyl chloride was sometimes used as the propellant. Talc, soapstone, and pyrophyllite were often used as pesticide carriers between 1965 and 1971; these substances were occasionally mixed or contaminated with asbestos.¹¹

This chapter is only a brief introduction to some of the toxic effects of pesticides. All chemical pesticides must be regarded with extreme caution.

For more information on the hazards of pesticides, readers can obtain the Health Research Group report: HOUSEHOLD PEST CONTROL: A CONSUMER'S GUIDE TO EXTERMINATING COMPANIES, by Stephanie Harris. (Address on back cover.)

CHAPTER 16

MERCURY

Properties and Uses: Mercury is a heavy silver metal that is liquid at room temperature but can vaporize into the air. If there are pools of mercury on the floor, there is undoubtedly mercury in the air. As a metal it is used in thermometers, meters and gauges, dental fillings, mercury lamps, and neon lights, to coat mirrors, and in the production of chlorine and caustic soda. Inorganic mercury compounds are used in drugs, dyes, explosives, and inks and fingerprint powder, while organic mercury compounds are often used in pesticides.

Acute Effects: These are inflammation of the mouth and gums, chest pains, severe headache and fever. If exposure continues, unconsciousness, respiratory complications, and death may result. However, chronic mercury poisoning is the type more commonly seen among industrially-exposed workers.

Chronic Poisoning: These are inflammation of mouth and gums, kidney damage, nervous system effects (tremors, psychological disturbances, and personality changes). Other symptoms are loss of memory, insomnia, irritability, depression, weightloss, and muscular weakness. Organic mercury is much more toxic to the nervous system than inorganic mercury. It can also cause blindness and severe brain damage.

REPRODUCTIVE EFFECTS OF METHYL MERCURY

Studies on the teratogenic effects of mercury are currently well-developed only for organic (methyl) mercury. Minamata Bay in Japan was the first place in the world that methyl mercury was shown to produce disastrous results on the human fetus.¹

A factory that made vinyl plastic routinely dumped its wastes into the Bay, where commercial fishing was the way of life for the villagers. From 1954 to 1960 a strange disease affected the old people and the children of the villages.

Children were born with severe cerebral palsy and severe mental retardation. Six to twelve percent of all births were affected.

Finally, scientists discovered that the cause of this dreadful disease was methyl mercury that the plant had been dumping into the Bay. The fish had ingested the mercury, concentrating it in their bodies. The villagers ate the fish and thus were exposed to the mercury.

Methyl mercury afflicts the nervous system. In the villages on Minamata Bay, no harm was done to the pregnant women. But their fetuses were harmed because the developing organs were more sensitive to the toxic effects of the mercury.

Alamogordo, New Mexico, was the scene of another methyl mercury disaster.²

A farmer purchased some corn seed. He fed it to his hogs. Although the grain was stained with a pink dye warning that it had been treated with a methyl mercury-containing fungicide, the seller did not tell the farmer that the grain was safe only for planting and should not be fed to animals.

The farmer slaughtered one of the hogs who had eaten the grain, and the family ate the meat. Three of the children subsequently developed severe brain damage. The pregnant mother was not affected, but she gave birth to a boy that was severely mentally retarded.

These tragic cases point out the fact that methyl mercury can readily pass through the placenta to the developing fetus and cause severe brain damage and mental retardation.³

The teratogenicity of methyl mercury has also been shown experimentally in mice and hamsters.⁴ Pregnant mice exposed to methyl mercury have offspring which have abnormal behavior; they display abnormalities in swimming and walking tests. As the mice grow older, they exhibit certain neurological (central nervous system) defects.⁵

This animal evidence shows that exposure of the fetus to chemicals in the mother's bloodstream can produce subtle changes in the functioning of the brain and nervous system. The defect might not be noticeable for years. Thus, a baby exposed during its mother's pregnancy to a toxic chemical may appear normal at birth but display behavioral abnormalities later in life.

CHAPTER 17

CARBON MONOXIDE (CO)

Properties and Uses:

Carbon monoxide is a colorless, odorless gas produced whenever there is incomplete combustion of material containing carbon, such as wood, coal, charcoal, natural gas, oil and other petroleum products and propane. It is one of the most widespread industrial hazards.

Sources of exposure in the workplace are furnaces, coking ovens, forges and most frequently, the internal combustion engine. Workers at risk include operators of fork lifts, front end loaders and diesel engines, sanitation workers, and anyone working in the area where these pieces of equipment are operating. The automobile emits significant amount of carbon monoxide, so workers in garages, tunnels and toll collection stations are also at high risk.

Effects: Because CO has no warning properties workers may be over-exposed without knowing until it's too late. The direct action of CO is on the red blood cells, where it binds with hemoglobin, the oxygen carrier of the blood. Hemoglobin will combine more readily with carbon monoxide than oxygen thus preventing red blood cells from carrying the proper amount of oxygen. The toxic effect of CO damage to vital organs is due to a lack of oxygen.

Acute Effects: CO exposure causes headache, drowsiness, nausea, weakness and lack of concentration. Continued exposure will cause collapse which may be followed by coma and death. Even if a person does not die, CO exposures may permanently damage parts of the body, particularly the heart and brain.

Chronic Effects: The long term effects of low amounts of carbon monoxide are not well established. There is concern that it may be damaging to the heart and brain.

Carboxyhemoglobin (COHb) formation in the bloodstream

Hemoglobin -- the chemical in red blood cells which carries oxygen from the lungs to the other parts of the body -- combines 210 times more easily with carbon monoxide (to form carboxyhemoglobin -- COHb) than it does with oxygen. It also impairs hemoglobin's ability to release the oxygen it still carries to the tissues.

EFFECTS ON REPRODUCTION

Although most people are aware of the way that high levels of carbon monoxide can cause a person to become unconscious or die, few are aware of the developing information on the effects of long-term, lower-level exposure. These include effects on the outcome of pregnancy and effects on vision, timing, and coordination, among others.

Animal studies have shown that carbon monoxide is harmful to the fetus. Pregnant rats chronically exposed to carbon monoxide have smaller litters and the baby rats develop abnormally.¹ Studies in Denmark with rabbits exposed to carbon monoxide during pregnancy show decreased size and increased chances of dying soon after birth. Baby rabbits whose mothers were exposed to 180 ppm of CO during pregnancy weighed 20% less than expected and nearly a third of them died within the first day of life as compared to practically none of the controls.

A second experiment exposed pregnant rabbits to 90 ppm of carbon monoxide. The birth weights were less than expected and twice as many of the offspring died the first day as in the control group. The levels of carboxyhemoglobin in these rabbits were under 9%.² Some heavy smokers have levels in that range.³ And some workers are exposed for at least part of their working day to levels as high as those to which the pregnant animals were exposed.

It is known that carbon monoxide can cross the placenta and enter the bloodstream of the fetus. This lowers the amount of oxygen that the fetus can obtain from the mother; it also impairs the hemoglobin's ability to give up the oxygen that it carries.

No studies clearly show teratogenic effects from low levels of carbon monoxide.⁴ There are about 10 case reports of situations in which the mother was acutely poisoned by high levels of carbon monoxide while pregnant. Almost all of the babies of these mothers had either a nervous system defect like mental retardation, cerebral palsy, etc., or they were stillborn. This was most likely due to the immediate effect on the nervous system of loss of oxygen.⁵

Carbon monoxide is one of the by-products of cigarette smoking. Cigarette smokers usually have a higher level of carboxyhemoglobin in the blood stream than do non-smokers (4-15%, as opposed to 1-2%).

Babies born to mothers who smoke weigh an average of 1/2 pound less than those of mothers who do not smoke.⁶ It is not known whether this difference is definitely due to carbon monoxide or to some other factor involved with cigarette smoking. Whether smoking during pregnancy has any effect on the miscarriage rate, stillbirth rate, or if it adds to the risk of the health of the baby is not clear at this time.^{7, 8}

Depending on the number of people smoking, how large the room is, and the adequacy of ventilation, non-smokers can get from very little carbon monoxide exposure to nearly as much as if they themselves were smoking. In offices or other indoor workplaces where people are relatively close together, smoking can definitely raise the level of carbon monoxide above the acceptable ambient air level of 9 ppm -- even in a room with adequate ventilation⁹ -- and much higher in rooms without ventilation.

On April 20, 1976, a group of 76 airline pilots and the Health Research Group filed a petition with the FAA to ban smoking in the cockpits of commercial

airplanes due to the hazards associated with low levels of carbon monoxide -- hazards that have to do with perception, coordination, and judgment of the pilots flying the aircraft.¹⁰

While smoking is one of the more common methods of carbon monoxide exposure, it is not the only one. Anyone who works around automobiles like highway, bridge, or tunnel toll collectors or guards are exposed to carbon monoxide. A study of bridge and tunnel workers in New York showed that workers were found to be breathing air containing an average of 63 ppm of carbon monoxide.¹¹

Another study of 5 female and one male non-smoking highway toll booth collectors in Kentucky showed that the workers were frequently exposed to levels of carbon monoxide inside the booths that exceeded 35 ppm (NIOSH's recommended exposure limit).¹² In either of these two situations, all workers -- but particularly pregnant women -- would be placing themselves at risk.

CHAPTER 18

MISCELLANEOUS CHEMICALS
(CARBON DISULFIDE AND PCB'S)

Many other chemicals and drugs have been associated with reproductive problems in humans and animals. Two chemicals with well-documented human evidence will be discussed here: carbon disulfide and PCB's.

CARBON DISULFIDE

Properties and Uses: Carbon disulfide is a clear, colorless liquid. It is used as an insecticide and as a solvent for waxes, resins, gums, and rubber. The primary use in the U.S. is in the manufacture of viscose rayon.

Acute Effects: It may act as a narcotic and anesthetic and possibly lead to stoppage of breathing. There are symptoms similar to alcohol intoxication, followed by depression, unconsciousness and possibly death. Irritation of the eyes, nose and skin also occurs.

Chronic Effects: The main effect of CS_2 is on the nervous system. Initially this may show up as dizziness, headache, increasing weariness and a sensation of "crawling" over the skin. Pain is usually felt, primarily in the arms and legs. If exposure continues fatigue, loss of strength, diminished reflexes and neuritis (inflammation of nerves) may result. Emotional changes can range from sleeplessness, vision disturbances memory loss, and depression, to hallucination and insanity, sometimes resulting in suicide.

REPRODUCTIVE EFFECTS

Studies show that carbon disulfide can affect reproductive functions in both men and women. Reports dating back to 1936 discuss irregularities in

menstruation after exposure to the chemical.¹ Later evidence shows that carbon disulfide also can cause decreased fertility and frequent miscarriages among exposed women.²

In the 1950's, women had to give up their work at a viscose rayon plant in Germany because they suffered from extreme bleeding during their periods.³ The author of the study stated that this experience has not been repeated in plants where carbon disulfide levels have been adequately controlled.

Male workers can suffer from sexual problems after exposure.⁴ Men exposed to carbon disulfide for 3 years (but who were not acutely "poisoned") were found to have decreased libido (sex drive) and erection troubles in one recent study. They also had a five times greater rate of sperm abnormalities than did the control group who were not exposed to the chemical.⁵

PCB's

Properties and uses: Polychlorinated biphenyls (PCB's) are used as cooling fluids in capacitors, transformers, and other industrial products and are also used as heat transfer agents, and as plasticizers for waxes and adhesives.

Environmental effects: PCB's have been found in fish and wildlife in widely scattered parts of the United States. PCB's are chemically similar to DDT and are not biodegradable.

Effects of Exposure: People who have worked with PCB's have complained of nausea, dizziness, allergic dermatitis, eye and nasal irritation, and allergic bronchitis.⁷ The known toxic effects of PCB's in humans include chloracne (an acne-like skin eruption), pigmentation of the skin, and eye discharges. In 1968 there was an outbreak of poisoning in Japan after 1000 people ingested PCB contaminated rice bran oil. The victims suffered from chloracne and from brown pigmentation of the skin and nails, as well as from problems with their eyes.⁸

CANCER AND REPRODUCTIVE EFFECTS

PCB's have caused liver cancer and reproductive problems in lab animals. For example, female monkeys fed PCB's in the laboratory had reduced ability to become pregnant and their pregnancies produced small⁹ infants with PCB's in their tissues.

PCB's have been found in human tissues and in human milk. In Japan, ten women who were pregnant at the time that they used a cooking oil with a high level of PCB's in it, gave birth to babies with discolored skin. The color faded during infancy, but the possibility of later-occurring effects remains.¹⁰

In addition to the babies with discolored skin, stillbirths have also been reported in two mothers who were exposed to PCB's.¹¹

-- PART D --

HAZARDS ON JOBS WHERE
LARGE NUMBERS OF WOMEN WORK

CHAPTER 19

COMMON JOB HAZARDS

A variety of jobs which employ large numbers of women are discussed in this section of the Guide. For each job, some of the major health hazards are discussed. But the lists of hazards by no means incorporate all the risks faced by workers on those jobs every day.

Workers are encouraged to use the "JOBS" section as a place to start from in investigating hazards. Further research and reading should turn up additional information that can be used by workers in seeing that their workplaces are made safer.

For hazards that are not described in either Parts C or D, workers should consult the reference books that are described in page A-29 and in the ACTION sections throughout the handbook. Work is Dangerous to Your Health is particularly useful in describing hazards.

Two common problems that are faced by workers at many of the jobs described in the following pages are varicose veins and job stress.

VARICOSE VEINS

Some veins have valves which let the blood flow in only one direction towards the heart. One of the main causes of varicose veins appears to be valves that "leak," letting blood flow back into the vein (like a dam) instead of toward the heart.¹ This increases the pressure in the vein and may make it swollen and unattractive -- "varicose."

Varicose veins are most common in people over 40, affecting one out of every two women and one out of every four men in that age group. Pregnant

women often develop varicose veins. People in jobs which require a lot of standing -- such as elevator operators, beauticians, dental assistants, sales-people -- seem more prone to varicose veins than people with sedentary (sit-down) jobs.²

But people who sit in one place all day (such as secretaries and sewing machine operators) may also experience problems. They should occasionally walk around or periodically elevate their feet during the day to prevent pooling of blood in the veins of the lower leg. Women who sit all day should avoid wearing tight garments or tight underclothing (particularly girdles) which can constrict the veins.³

STRESS

Workers often talk about the stress of their jobs, yet concerns about these feelings are often shunted aside since stress is a vague and often ill-defined condition. Yet, stress is a very real factor in the workplace, and it is recognized that different jobs have different kinds of stress.⁴ Nurses are frequently under tremendous strain when they have to care for the dying patient, interact with the family, and still "keep up a good front."⁵ So is the office worker who has a demanding, repetitive job that requires attention to detail, productivity, and efficiency.⁶ And so is the telephone operator under constant pressure to work faster and more accurately and who knows that her calls are being monitored by a supervisor.⁷ Lack of job satisfaction because there's no job to "move up to," or because of boredom or inadequate financial compensation also places stress on workers.⁸ Noise on the job is an added cause of stress for millions of workers.

How does this stress manifest itself? Many physical complaints or diseases like fatigue, reduced appetite, chest pain, peptic ulcers, skin rashes, migraine

headaches, high blood pressure, or coronary heart disease are believed to result from or be aggravated by stress. Other workers may feel anxious, have difficulty sleeping, or be extremely tense.⁹

Drug abuse, alcoholism and suicide are all believed to be partially due to unresolved job and personal stress. Some job factors that lead to excessive drinking include lack of feedback on work, work "addiction," and stress over one's "role."¹⁰

Job discrimination may also cause stress. The California Workers' Compensation Board recently awarded two women settlements for job-related depression--due to discrimination on the basis of sex and race. One woman was demoted while men in her department were promoted. The other was harrassed because of her ethnic background. In both cases there was ample proof that the job and the conditions of work were instrumental in producing the depression.¹¹

CHAPTER 20

JOB: CLERICAL WORKER

Number of Women Employed: 10 million (including over 4 million stenographers, typists and secretaries).

% of Workers Who Are Women: 80%

SOME POTENTIAL HAZARDS: poor ventilation, asbestos in air conditioning, ultra-violet light, chemicals for office machines, solvents, ozone, noise, repetitive tasks, stress, sitting all day.

Almost one-third of all employed women are clerical workers. Office and clerical workers are generally not unionized, are paid low wages, and often have tiring jobs that are stress-filled. Although the jobs of clerical workers are not usually considered hazardous, there are some potentially serious health hazards found in office environments. Office workers have been largely ignored by OSHA inspectors, although offices (except for public employees*) are covered under the Occupational Safety and Health Act.

INJURY STATISTICS

Few statistics exist on job injuries or illnesses among office workers. In a 1959 study of workers in California, the State found that 26 office workers (not limited to clerical) had died and 3000 had suffered disabling injuries.¹ This has led to a nationwide projection of 40,000 office workers disabled every year and 200 office-related deaths (again, not limited to clerical staff). These injuries and deaths result in over \$100 million paid out annually in medical and compensation expenses.²

* Public employees in non-federal agencies are covered in states that have taken over OSHA enforcements.

In the California survey, 53% of the disabling injuries suffered by women were the results of slips or falls. One out of four of these falls was from a chair; about 20% of the falls were due to "chair defects." ³

DESIGN OF CHAIRS

Varicose veins may be a problem for workers who sit in the same position all day (see Chapter 19). Poorly designed chairs may also be the cause of backstrain and fatigue. ⁴

A University of Wisconsin professor who recently designed a chair especially suited for office workers said: "Executives get the best chairs, and secretaries get the worst, which is too bad because secretaries spend more time in them." His new chair can be tilted to provide extra back support and is adjustable to height, somewhat like specifications for well-designed office chairs that are required in West Germany. ⁵ Unfortunately, few employers choose chairs for clerical workers with comfort and healthful design in mind.

FATIGUE

Bad lighting, poor ventilation, crowding, noise, boredom, repetitive tasks -- all can lead to stress and fatigue of the worker. (See Chapter 19). Studies of female key punch operators and typists in Japan found local fatigue due to workers being forced to "keep the same posture with the same movement all day long." ⁶ Constant repetition of these stereotyped movements has led to painful wrist problems among some typists. The resulting condition is called "tenosynovitis." ⁷

VENTILATION

Many workers complain that their offices are either too hot or too cold and that comfortable temperatures are seldom the norm.⁸ But even air conditioning can present a serious threat to workers' health.

According to a Mt. Sinai School of Medicine study, asbestos -- circulated through the air system -- in some office buildings has reached dangerous levels. The hazard is greatest in buildings erected during 1958-1970, when asbestos was most widely used for fire-proofing and insulation.⁹ Some of the asbestos fibers are now coming loose. (Asbestos may cause lung, stomach, colon, and rectal cancer and can also cause asbestosis and cancer of the lining of the lung or stomach).

Adequate ventilation is particularly needed in rooms where duplicating machines are used, especially ones using ammonia or methanol. According to a National Safety Council report, concentrations of methanol around poorly ventilated duplicating machines can reach 200-300 ppm.¹⁰ (200 ppm is the legal limit). Chronic exposure to methanol can lead to eye irritation, headaches, giddiness, insomnia, and problems with vision.¹¹

Copy machines may also present hazards, again especially in rooms where there is inadequate ventilation. Some office copying machines employ ultraviolet light or infrared radiation.¹² Several hours of exposure to ultraviolet light can cause temporary eye damage (which usually is self-repairing).

Ozone is produced as a by-product from many copying machines.¹³ Ozone can produce throat irritation, cough, headache, pressure and/or pain in the chest, and breathing difficulties. It is irritating to the eyes, as well as to the tissues lining the throat, air passages, and lungs. At higher levels

it can cause fluid in the lungs, headache, drowsiness, and shortness of breath.¹⁴ Ozone may also be a mutagen (see Part B for definition) as well -- chronic exposure to ozone has been shown to cause chromosome breaks in both hamster and human cells grown in the laboratory.¹⁵

It is of interest that during the last five years, the National Institutes of Health near Washington, D.C. have installed special ducts in rooms with copying machines to vent the fumes directly to the outside. This step was taken because of concern over possible hazards from the fumes.

NOISE

Noise is a very common problem in rooms where several office machines or typewriters are located. Particularly when coupled with rush assignments and repetitive work, noise can cause symptoms of stress among office workers.

Various types of acoustical controls to cut down noise levels in offices, such as carpeting, plants, mats under typewriters and plastic covers on machines, have been tried. The best control, of course, is to design and manufacture a "quiet" machine. A report entitled Noise and Office Work¹⁶ contained the following examples of ways that manufacturers and employers could cut down office noise:

- At a G.E. plant in Evansdale, Ohio, office employees were distracted by noise from the factory [75-79 dB(A)] in their offices. An industrial hygienist had the ceiling resuspended, doors soundproofed, and walls acoustically treated to lower the noise levels.
- Felt was used on RCA print-out equipment to lower the noise from 80 to 55 dB levels.
- Sound-absorbing materials lowered the noise level from 50 to 35 dB in

a telegraphic office. The noise reduction resulted in a 43% reduction of errors by the staff.

-- A typewriter manufacturer testified at a noise hearing that sound-attenuating materials on electric typewriters add only sixty cents per typewriter to manufacturing costs.

The same report stated that U.S. businesses are estimated to waste \$4 million a year because of inefficiency due to noise. But noise costs more than just inefficiency -- it leads to hearing loss and greatly adds to stress among workers, which in turn may have other harmful effects on a worker's health.

CHEMICALS FOR OFFICE MACHINES

Various kinds of chemicals, such as stencil fluid, copy machine toner, and liquid "eraser" have been finding their way into offices in recent years. Many of these products are organic solvents, but most of them are not labelled so there is no easy way for an office worker to determine the hazards of the contents.

At least one of these fluids is known to have contained trichloroethylene,¹⁷ a chemical which can cause headache, fatigue, nausea, vomiting and confusion with acute exposures and that has recently been implicated as a cancer-causing chemical¹⁸ (see Part C).

ACTION

- Write to manufacturers of office chemicals and request a list of chemicals used in their materials, if you believe that the supplies you are working with might be dangerous. Then check the hazards of these ingredients in books such as Work Is Dangerous to Your Health.
- A questionnaire and a pamphlet on hazards faced by office workers has been prepared. It is very useful for introducing office workers to the health hazards they may face on their jobs. For a single copy, send 50¢ to Marsha Love, 270 Riverside Drive, 10C, New York, New York 10025.
- Noise and Office Work by Susan Mackenzie. Key Issues Series No. 19, New York State School of Industrial and Labor Relations, Cornell University, Ithaca, New York 14853 (\$3.00).
- Various organizations of office workers have been formed around the country. Their major efforts revolve around affirmative action issues and government enforcement of equal opportunity laws. Various campaigns have been waged against banks, insurance companies, legal offices, employment agencies, publishing offices, and temporary agencies. These groups include:
 - ** Women Organized for Employment -- San Francisco
 - ** Women Employed -- Chicago
 - ** 9 - 5 -- Boston
 - ** Cleveland Working Women
 - ** Women Office Workers -- New York
 - ** See p. A-19 for information on UNION WAGE
- Workforce, July-August 1974, had an issue on organizing in the office, which discusses various women's organizations that are working with clerical workers. It includes an article on health hazards by Alexis Rankin. (Vocations for Social Change, 5951 Canning Street, Oakland, Ca. 95609).
- Many industrial unions have begun to organize office personnel. Some of the unions and associations actively organizing clerical workers include: OPEIU, SEIU, AFSCME, District 65 of the Distributive Workers of America, CWA, Teamsters, UAW, and various state and regional associations, such as California State Employees Association and the Clerical and Allied Services Employees Association in California.

CHAPTER 21

JOB: TEXTILE AND APPAREL WORKERS

Number of Women Employed: 467,000 (textile mill products)
1,062,000 (apparel & other textile products)

% of Workers Who Are Female: 46% (textile)
81% (apparel)

SOME POTENTIAL HAZARDS: raw cotton dust, synthetic fibers, skin irritants, noise, heat and humidity, poorly designed seating, bad lighting, hazardous substances (e.g., organic solvents, dyes, mothproofers, flame-retardants, spot-cleaners, oil mists, and asbestos.)

The textile and apparel industries have traditionally employed large numbers of women. Many of the early struggles to better working conditions revolved around oppressive sweatshop conditions in textile mills and clothing factories.* But to this day, some of the same conditions -- poor ventilation, inadequate lighting, heat, humidity, and crowding -- still exist.

TEXTILE WORKERS spin, weave, knit, and finish all types of natural fibers, as well as make synthetic fibers. Dust is a particular hazard with natural fibers; toxic chemical substances are a problem in manufacturing synthetics. There are also dangers in bleaching, dyeing, and finishing textiles, as well as in treating fabrics with mothproofing agents, flame-retardants, and chemicals for wrinkle resistance.

At first glance, hazards in the **CLOTHING INDUSTRY** would appear to be limited to the safety problems, backstrain, and fatigue that result from

* The first locals of the International Ladies Garment Workers and the Amalgamated Clothing Workers were formed in the early 1900's.

sitting at a sewing machine all day. But apparel workers are also exposed to an alarming array of health hazards, from using sprays and solvents, to handling fabrics that have been treated or dyed with chemicals.

Many of the hazards described below are faced by workers in both the textile and apparel industries.

DUSTS AND FIBERS

COTTON DUST

OSHA has estimated that over 800,000 workers work with cotton fibers and therefore may be exposed to cotton dust.¹ Exposure to raw cotton dust in the textile industry often produces a lung disease called byssinosis (or brown lung). Byssinosis is thought to be caused by an allergic-like reaction to some substance in the dust. The disease often begins after only short exposure to the dust. Symptoms of chest tightness usually appear on Monday mornings ("Monday morning fever") after the worker has been away from the mill for a few days. If exposure to cotton dust continues, the asthma-like condition can gradually worsen and become constant. Repeated exposure can lead to the development of severe lung disease -- chronic bronchitis or emphysema.²

Approximately 25-30% of all workers in U.S. cotton factories had byssinosis in 1971.³ The disease is also common in European textile mills. 3000 workers -- 65% of them women -- are receiving disability pensions for byssinosis in England.⁴

The current OSHA standard for cotton dust is 1 milligram of dust per cubic meter of air (1 mg/M³), but experts agree that this level will not pro-

text workers. Better ventilation and dust controls are required to reduce the levels. Although NIOSH has recommended that the dust levels be reduced to under 0.2 mg/M^3 , OSHA has not yet taken any action to revise the standard.

SYNTHETIC FIBERS

Few studies have reported adverse effects from inhaling synthetic fibers. One recent study reported a variety of lung changes in seven textile workers. The changes varied from episodes of difficult breathing while exposed to the dusts to chronic debilitating lung disease. It appears that the workers developed an allergy to the fibers. Also, pieces of the lung from each worker were examined and fibers were imbedded in the lung tissue. The authors conclude that each worker's lung disease was due to synthetic fiber dust particles.⁵

SKIN IRRITANTS

Dermatitis (skin rash) can be caused by handling cotton and synthetic yarns. Formaldehyde and the oils and chemicals used in dyeing and finishing processes can irritate the skin. The variety of different materials handled by workers during one day often makes it difficult to determine exactly which products are causing the skin problems.

Triethanolamine is an ingredient of an oil solution used to process synthetic textiles. In a study of 200 women workers who had contact with the chemical, the majority of workers developed dermatitis.⁶

NOISE

The first report of hearing loss in a textile worker was made in Russia in 1896!⁷ The worker was a weaver. In a 1971 study of retired women jute

weavers, 90% were found to have hearing loss severe enough to warrant hearing aids.⁸

Hearing loss has also been reported among carders, spinners, and operators of false-twist texturing machines.

The following noise levels are believed to be common in textile operations:⁹

spinning machines	80 - 95 dB(A)
gripper shuttle machines	85 - 95 dB(A)
weaving machines	95 - 105 dB(A)
textile loom	106 dB(A) ¹⁰
false twist texturing machines	105 - 115 dB(A)

OTHER HAZARDOUS SUBSTANCES

By far, one of the most serious hazards for textile and apparel workers is exposure to chemicals. A wide variety of chemicals are used for dyeing, finishing, rot-proofing, moth-proofing, mercerizing and bleaching, flame-retarding, and making fabric wrinkle-resistant. Health effects from exposure to a few of these chemicals are briefly described below.

DYES

Certain dyes that have been fed to animals convert into the chemical benzidine after being ingested. Benzidine is a well-documented cause of human bladder cancer. Whether this process could also happen in textile workers who are exposed to dyes is unknown, although there is evidence in Japan of a high incidence of bladder cancer among workers who normally twist their paint brushes on their tongues to make a fine point for painting designs on kimonos.¹¹

SOLVENTS AND SPRAYS

Organic solvents, such as benzene and toluene (see Part C) are used in waterproofing processes. Possible hazards of dimethylformamide, which is used as a solvent in making synthetic fibers, are discussed in Part C. In a German study, its use has been linked to an increased rate of miscarriages.

Formaldehyde is a common problem for both textile and apparel workers. The chemical is used in waterproofing and permanent press operations, in making fabrics shrink resistant, as a dye-fixer, and as a disinfectant to prevent harmful action of micro-organisms on textiles.

A study of a fabric shop where workers complained of eye irritation and sore throat revealed levels of formaldehyde at 0.13-0.45 ppm -- levels much below the current OSHA standard of 3 ppm.¹² Some workers can also develop allergic reactions to it and may develop dermatitis.¹³

Another survey of a Tennessee garment factory was conducted after 10 women workers felt dizzy and "passed out" shortly after reporting to work one day. Measurements showed levels of formaldehyde at 2-10 ppm. Although the authors were not sure that the loss of consciousness among the women was due to the formaldehyde, they suggested that the adequacy of the formaldehyde standard should be re-considered.¹⁴

Formaldehyde may be an even more serious hazard in that it is believed to combine with hydrogen chloride to form the cancer-causing chemical bis(chloromethyl)methyl ether (BCME).¹⁵ Preliminary NIOSH surveys found detectable levels of this chemical in several dyeing and finishing plants.¹⁶

Experimental studies also show that formaldehyde causes mutations and that it may therefore be carcinogenic.¹⁷ (See Part B for definitions.)

Silicone sprays are used for water and heat proofing textiles. They often contain potentially hazardous propellants (see Part D for a discussion of aerosol hazards).

Trichloroethylene and perchloroethylene are commonly used in the "Solvex" operation in garment factories for the dissolving of basting threads.¹⁸ In 1972, 50 workers -- mostly women -- were overcome by perchloroethylene vapors escaping from a faulty distilling unit in a knit goods processing plant.¹⁹ (See Part C for hazards of these chemicals.)

According to a study conducted by the Amalgamated Clothing Workers, chloroprene and styrene are sometimes used to spray the edges of cloth to prevent raveling.²⁰ Chloroprene has been linked to lung and skin cancer in studies of Soviet workers²¹ and there is recent evidence of increased cancer in plants in which styrene and butadiene are used.²² (See Part C)

CARBON DISULFIDE is used in the production of viscose rayon. Chronic poisoning symptoms are weakness, fatigue, headaches, difficulty in sleeping (often with nightmares), psychological disturbances and loss of appetite. High exposures have led to sexual problems in men and menstrual difficulties in women workers.²³ According to one recent study, workers in the viscose rayon industry may run an increased risk of coronary artery disease and high blood pressure after long exposure to carbon disulfide.²⁴ Depression, and an increased rate of suicide, have been noted in those repeatedly exposed to moderately high concentrations.²⁵ (See Part C)

FLAME-RETARDANTS

In the past few years several consumer product safety standards have been adopted to require certain textile products to be more resistant to flame. For example, sleepwear for children up to age 12 now must be flame-retardant. And carpets and mattresses must also be flame-retardant.

Few of the chemicals were ever tested for chronic effects before being introduced as flame-retardants. Recent tests by the Environmental Protection Agency, by Dr. Bruce Ames at University of California, Berkeley, and by Dr. Herbert Rosenkranz at Columbia University show that the flame-retardant chemical most commonly used for children's sleepwear, TRIS*, causes mutations in certain strains of bacteria and that it may therefore be carcinogenic^{26,27} (See Part B for an explanation of the bacterial test.) Tests to see if TRIS causes cancer in exposed animals are now being conducted.

Manufacturers, consumers, textile workers, and garment makers may all be at risk. Chemical workers manufacture the flame-retardant; children may suck on their pajamas and the flame-retardant material touches their skin; parents handle them; textile workers may actually touch the chemical itself; apparel workers may handle and breathe treated fibers. In March 1976 the Environmental Defense Fund asked the Consumer Product Safety Commission for stricter controls on the use of TRIS as a flame-retardant.

ASBESTOS

Asbestos is sometimes used in textile products to increase their strength and fire resistance. A British study of 900 female asbestos workers was published in 1972. The women had started working at a plant making textiles and insulation between 1936 and 1942²⁸. The workers showed a highly significant excess of deaths (by 1968) from cancer of the lung and pleura (linings), as well as from other cancers and other respiratory diseases. The most marked increase in deaths were among women who had high asbestos exposures for over

*TRIS (2,3-dibromopropyl)phosphate, used to flame-retard most polyesters and polyester cotton blends.

two years.

Among the 900 women studied were 400 women who had been involved in carding, spinning, doubling, or weaving in textile departments and 100 women involved in mattress-making. Eleven of the women developed mesothelial tumors (rare tumors of the lining of the lung and chest cavity seen only with asbestos exposure) -- and 6 of these women had worked in the factory for less than 2 years.

These results were similar to those found in an earlier study of male workers at the same plant.²⁹

Several years ago fabric made of 8% asbestos fiber was imported into the U.S. and manufactured into over 150,000 coats before the garment workers realized they were working with asbestos. (The asbestos was added solely to bring the material in under a lower tariff rate.) Shaking the coat "created asbestos dust levels equal to those in factories."³⁰ According to the U.S. Consumer Product Safety Commission, asbestos is not allowed to be used in apparel under the Federal Hazardous Substances Act.³¹

ACTION

- The Textile Workers Union of America has developed an occupational health questionnaire to assist local unions in collecting information about job hazards. It has also held training courses in health and safety for members. The union, in conjunction with the North Carolina Public Interest Research Group, filed a petition in January 1975 with the U.S. Department of Labor, requesting a stricter cotton dust standard (0.1mg/M³). When over a year later the Department of Labor had still not acted on the petition, the two organizations filed a law suit to compel the Secretary of Labor to issue a new standard.
- The Amalgamated Clothing Workers of America has completed a one-year survey of health hazards in the men's apparel industry, which employs approximately 400,000 workers -- about 85% women. The investigation was conducted in cooperation with NIOSH. (Note: The ACWA and TWUA are slated to merge in June 1976).

- There are two projects in the Carolinas aimed at organizing brown lung victims. The groups offer brown lung victims assistance in getting worker's compensation and have prepared useful pamphlets on cotton dust and brown lung. The South Carolina group also trains workers in health and safety.
 - ** Brown Lung Project
c/o North Carolina PIRG
P. O. Box 2901
Durham, N.C. 27705
 - ** The Southern Institute for Occupational Health (SIOH)
P. O. Box 861
Cayce, S.C. 29033
- The Environmental Defense Fund petition filed with the Consumer Product Safety Commission has useful references to the potentially toxic effects of TRIS. To obtain a copy of it, contact:

Environmental Defense Fund
1525 18th Street, N.W.
Washington, D.C. 20036
- Sherry Selevan at NIOSH (the National Institute for Occupational Safety and Health) in Cincinnati is conducting a study of women who work in the asbestos textile industry. For more information, contact her at NIOSH (address in Appendix C).

CHAPTER 22

JOB: HAIRDRESSER AND BEAUTICIAN

Number of Women Employed: 425,000

% of Workers Who Are Women: 90%

SOME POTENTIAL HAZARDS: standing all day, hair sprays, hair dyes, ingredients or propellants of aerosol sprays, cosmetics; other hair, nail, and skin beauty preparations.

Hairdressers must stand in a relatively fixed position for long periods of time each day, and therefore are likely to develop varicose veins. They often work in salons or studios that are small, humid, and poorly ventilated. And they may suffer "nervous fatigue from the constant need to be pleasant to customers!" ¹

Hairdressers and beauticians are also exposed daily to a variety of chemicals; some of the most dangerous are found in hairsprays and hair dyes. Although the exact composition of these AEROSOL HAIR SPRAYS is considered a trade secret by the industry, they are generally known to be made from resins, plasticizers, solvents, additives and a propellant.²

Vinyl chloride was used as the propellant in many hair sprays until 1974, when its use was banned after the chemical was implicated as the cause of a rare liver cancer among exposed industrial workers (see Chapter 11). The hairsprays that most commonly contained vinyl chloride were those used in commercial beauty shops. There is some evidence that vinyl chloride may also cause birth defects in children of exposed workers but this has not yet been investigated carefully among beauticians who had been exposed.

The most frequently used propellants in aerosol hair sprays are Freon or other fluorocarbons. Freons have also been implicated by scientists in causing depletion of the ozone layer of the earth's atmosphere, which forms a shield against ultraviolet radiation. A decrease in the ozone layer could result in an increase in skin cancer. Sudden deaths have occurred when people purposefully inhaled sprays "to get high."³ Although this type of exposure is not likely to occur in beauty shops, the effects of constant, low-level exposure to fluorocarbons on the heart or lung are still unknown. An industry-sponsored study measured concentrations of propellants and solvents in peak samples (taken right after spraying a hairdo) in the immediate vicinity of the beautician. The concentrations, for materials such as fluorocarbons, propane, isobutane and methylene chloride ranged from 1-310 ppm (parts per million).

An earlier study had indicated that propellant concentrations during and immediately after spraying actually fluctuate between 100 and 500 ppm.⁴

Certain hairsprays contain resins as the hairholding or stiffening component. PVP (polyvinyl pyrrolidone) is frequently the resin used. These resins have been suspected of building up in the lung and causing a lung disease called "thesaurosis," although the evidence about this lung disease is conflicting.⁵

A NIOSH study was conducted to determine if cosmeticians exposed to hairsprays do indeed have an increased risk of chronic lung disease. The study compared practicing beauticians with hairdressing students, and also with non-exposed college students.

Results showed that the women who were practicing beauticians (the group with the longest exposure) had twice as many symptoms of lung disease as either of the student groups. Cosmetologists in small salons were seen to be at the greatest risk of lung disease.⁶

The NIOSH report also noted that an earlier study of 227 cosmetologists had found one definite and 4 suspected lung cancers -- more than would have been expected.⁷ Another earlier study had demonstrated that PVP resins caused cancer in experimental animals.⁸

Because of these findings on cancer, NIOSH conducted a "sputum cytology study" -- that is, they looked at the cells that were found in the cosmetician's phlegm (coughed-up mucus). Sputum abnormalities are believed to possibly indicate pre-cancerous or cancerous changes in the lung.⁹ The NIOSH study showed that more of the practicing cosmetologists studied had abnormal sputum cells than did either of the student groups.

The ingredients of hair sprays -- with their complex combination of chemicals -- have never been adequately tested to determine their hazardous effects on workers or consumers. In one experiment, healthy men and women (volunteers) were exposed to 20 second bursts of hair sprays. Breathing difficulties and chest tightness, caused by constriction of the air passageways, occurred immediately after spraying in a significant number of the subjects.¹⁰

HAIR DYES have also been flagged as potential threats to the health of beauticians -- as well as to those consumers who use them. Dr. Bruce Ames, a biochemist at the University of California, Berkeley, studied 169 "permanent" hair dyes (the hydrogen peroxide type) and discovered that

150 (89%) of them cause mutations in bacterial lab cultures.¹¹ (See Chapter for an explanation of the Ames test). According to Ames, over 35% of American women dye their hair. (The hair dye is a \$250 million dollar industry.)

Mutagenic hair dyes (ones that affect genetic material) were found in every hair dye product line tested.* Eighteen different chemicals are used in these permanent hair dyes — and nine of these were found to be mutagenic in the Ames test. Ames points out that extremely few chemicals tested in his laboratory cause mutations. He concludes that "it appears that each of the hair dye compounds we have found to be mutagenic has a high probability of proving to be a carcinogen [a cancer-causing agent]." ¹²

Ames report indicated that hair dyes can be absorbed through the scalp. Because of his alarming findings, he recommends that a study of both birth defects and cancer be conducted among the millions of women using hair dyes as well as of workers who manufacture hair dyes or use them on their job.

Skin diseases, allergic reactions, and asthma have also all been reported among beauticians. The following list shows some of the hazardous products used in beauty salons.

* These included products from Clairol, Breck, Revlon, Albert-Culver, Tussy, Cosmair, Gillette, and Roux Laboratories.

TABLE 6: SOME HAZARDOUS PRODUCTS USED IN BEAUTY SALONS

<u>product</u>	<u>chemical contents</u>	<u>effects</u>
organic hair dyes	at least 18 different chemicals, depending on the dye	respiratory allergies; skin irritation. 9 out of the 18 found to cause mutations in lab tests (see above discussion).
nail sprays & cold wave solutions ¹³	monoethanolamine	allergies; can lead to asthma
nail varnishes, plasticizers & resins	solvents: benzyl alcohol, ethyl alcohol, acetone, pentyl alcohol thinners: xylene, toluene, occasionally benzene	allergies; skin irritation (See Chapter 12)
depilatories	sodium thioglycolate	skin irritant
permanent wave ¹⁴ solutions	ammonium thioglycolate	skin irritant & allergies

Source: International Labour Organization, Encyclopedia of Occupational Safety and Health, pp. 632-633, except where otherwise noted.

In addition to the hazards for workers using these products on their job, the worker at the manufacturing level is also endangered. A woman worker who contacted the authors complained of lack of ventilation in an area where bleaching powder was packaged and where there were open drums of acetone and nail enamel.¹⁵

ACTION

- Write to the manufacturers of the cosmetic preparations and hair dyes that you use and request their chemical contents.
- Hairdressers should switch to non-aerosolized hair sprays which are less dangerous than aerosols. (Many beauty salons already have switched to non-aerosol, pump sprays.)
Read How Aerosols can Affect Your Health, a 60 page manual available from the Center for Science in the Public Interest, 1779 Church Street, Washington D.C. 20036.
- The causes of death among female beauticians are being studied in California. Results should be available by August 1976.

CHAPTER 23

JOB: LAUNDERER AND DRYCLEANER

Number of Women Employed: 108,000

% of Workers Who Are Female: 64%

SOME POTENTIAL HAZARDS: Laundries: soaps, detergents, caustics, bleaches, acids, heat, heavy lifting, clothes contaminated with industrial chemicals, dust, or micro-organisms.

Dry-cleaning: perchloroethylene, trichloroethylene, carbon tetrachloride, benzene, naphtha, other solvents, heat from steam-pressing.

To the extent that some laundries and dry-cleaning establishments are under the same roof, workers in either job may be exposed to the hazards of the other.

LAUNDRIES

In 1863 women laundry workers in Troy, New York, went on strike because of their hot and oppressive working conditions and their low wages.¹ Laundry work is generally still hot and tiring, since steam pressing is commonly used and nearly all the work is done while standing.

A 1972 California survey of 587 disabling work injuries among laundry workers revealed that 29% of those injured were hurt as a result of strain or overexertion (mostly in handling heavy laundry bundles or other containers).² Falls ranked second and occurred mostly in areas where water spills had not been wiped up or where bundles of laundry littered the aisles. The California survey also showed that 43 injuries were sustained by pressers (usually women) who were burned when their hands or fingers were caught in

clothes pressers.

Strains, sprains, dislocations and hernias accounted for 40% of all lost-time injuries to California laundry workers. The amount of heavy lifting that must be performed is a serious cause for concern. A 1958 study of over 3000 pregnancies in England revealed that a higher proportion of women who had been engaged in heavy work during pregnancy had babies with birth defects.³ In that study laundry workers appeared to be at special risk. 15% of laundry workers had babies with major defects compared to only 1.5% of all women studied. (Of the 27 laundry workers in the study, 4 had babies with major defects.*)

Many workers are employed in laundries which supply laundered work clothes and towels to industrial plants. Many of these launderers are unknowingly exposed to cancer-causing or other dangerous industrial chemicals. For example, there are some cases of women who developed asbestos-related diseases after laundering the work clothes of asbestos workers.⁴ Generally, laundry workers are not informed about the chemicals and dusts which contaminate the dirty work clothes.

Concern over the extreme dustiness of clothes worn by ceramics and pottery makers prompted a 1971 study of British laundry workers who handle those dusty overalls.⁵ The study revealed that high dust concentrations were reached when laundry workers shook out and sorted heavily soiled laundry from the local potteries. The dust concentrations in each laundry surveyed exceeded the allowable dust level (the TLV) for the period monitored.

* The author did not ask women what hazardous substances they were exposed to at work.

Although the study did not reveal any disease among the 31 women studied, recommendations were made that the overalls be loaded directly into the washing machines without shaking them or that they be dampened before handling. The author reported that experiments were being conducted with bags that would dissolve in the washing machine, thus allowing the clothes to release their hazardous contents without the launderer handling them.

Recent OSHA standards require commercial laundering (as opposed to home laundering) of industrial clothing worn by workers handling cancer-causing chemicals. Commercial laundry workers need protection too. They should be informed about the hazards involved in handling these garments and the proper precautions that are necessary to protect themselves. The OSHA asbestos standard requires employers to notify whoever does the laundering of the hazards involved. Where possible, disposable work clothes that would not have to be handled by laundries would be most desirable in these types of hazardous occupations.

Hospital laundry workers are also at risk, in that they may be exposed to germs on bed linens and clothing.

DRYCLEANERS

The most serious hazard faced by drycleaners is the use of solvents in the drycleaning operation. Three basic solvents are used in most modern establishments: petroleum solvent (also called naphtha or Stoddard solvent) -- in 27% of plants; perchloroethylene -- 70% of plants; and fluorocarbon solvent -- 3% of plants.⁶ Trichloroethylene, which has recently been shown to cause cancer in animal tests, is also occasionally used.⁷ (See Chapter 12).

Although naphtha is flammable, the widespread use of perchloroethylene ("perc") is the cause for greatest concern. At concentrations above 300 ppm, a person becomes dizzy, giddy, sleepy, nauseous, loses coordination, and suffers eye and throat irritation. With extended exposure, the person can lose consciousness or die. Liver damage has also been reported among some exposed workers.

The standard for exposure to "perc" is 100 ppm over an 8 hour day. And the regulation says that no one may be exposed to levels over 300 ppm for any more than 5 minutes during a three hour period. However, a survey done by the International Fabricare Institute of drycleaning plants in Washington, D.C. found that peak levels over 100 ppm were common -- and that one plant frequently exceeded 600 ppm.⁸

Spills are particularly dangerous. NIOSH estimates that spilling two tablespoonsful of "perc" in a 10' x 10' closed room can cause air concentration of about 300 ppm.⁹ Workers should also be careful to avoid exposure when machines are opened to transfer garments. Garments should be aired before pressing.

The Michigan Health Department has recommended that drycleaning plants be equipped with air blowers that can change the air every 5 minutes. The ventilation system and equipment should be checked periodically for leaks. Perc vapors should be contained in drycleaning machines or captured by vapor absorbers.¹⁰

According to the industry trade association, solvent recovery systems not only protect workers -- they are also economical in saving the industry millions of dollars a year in solvent costs.¹¹

HAZARDS COMMON TO BOTH GROUPS OF WORKERS

Both launderers and drycleaners are exposed to solvents that may cause skin irritation. In addition, many launderers are constantly exposed to hot water, soap and detergents that can irritate the skin.

Both groups of workers sometimes have to use spot cleaners for stains that did not come out in machine cleaning. Some of these may contain trichloroethylene. In the past, some of them contained benzene, carbon tetrachloride, or chloroform. (See Chapter 12). Spot removers with these substances should be outlawed. Wherever spot removers are used, local exhaust ventilation should be provided over the "spotting" table.

ACTION

- Although it covers mostly safety hazards, a NIOSH guide may be useful to some workers:

Health and Safety Guide for Laundries and Drycleaners
National Institute for Occupational Safety and Health
Post Office Building
Cincinnati, Ohio 45202

Single copies are free.

- Workers who launder industrial work clothes should request information about the precautions needed in laundering them and should be informed about the presence of dangerous contaminants.
- The National Cancer Institute is currently completing studies to determine if perchloroethylene causes cancer, since the chemical is similar to several other chemicals (e.g. trichloroethylene and vinyl chloride) which have been linked to cancer.

CHAPTER 24

JOB: ELECTRONICS WORKERS

Number of Workers; 271,000 (computers, semi-conductors & electronic components)

% of Workers Who Are Women: over 75% *

SOME POTENTIAL HAZARDS: solvents: trichloroethylene, methylene chloride, chloroform, toluene, Freon, methyl ethyl ketone, acetone, methyl and ethyl alcohol;

acids : hydrofluoric, sulfuric, nitric, acetic; antimony, arsenic, phosphorous, boron, epoxies, cyanide.¹

When compared to most other industries, electronics is relatively new. This may partially account for the scarcity of information in medical journals about health hazards in electronics, although the nature of the workforce is undoubtedly an equally important factor. For example, there is a very high turnover rate in the industry. Most of the workers are women; many are non-white; and a high percentage of them do not speak English. Few electronics plants are union-organized.

Electronics workers are exposed regularly to a wide variety of solvents and other chemicals. The one most commonly used -- and of most concern to many of the workers -- is trichloroethylene.

* From January 1976, Employment & Earnings, Bureau of Labor Statistics. Exact figures by sex unavailable from U.S. Bureau of Labor Statistics. Estimate by workers in the industry.

TRICHLOROETHYLENE

This chemical was the subject of a leaflet The Printed Circuit circulated in 1975 by concerned electronics workers in the Santa Clara Valley in California, where there are an estimated 70,000 unorganized women electronics workers.²

The effects of trichloroethylene are described in greater detail in Part C. Briefly, the chemical can cause headache, dizziness, fatigue, visual disturbances, mental confusion, and sometimes nausea. Incoordination may also result from acute exposures. Prolonged skin contact can strip the skin of oils and can blister, irritate, and crack the skin. There have been some reports of liver and kidney damage. In June, 1975, NIOSH issued a health hazard alert on TCE because studies had shown that the chemical caused liver cancer in exposed mice.

-- TCE SURVEY AT AN ELECTRONICS PLANT

The current OSHA standard for exposure to TCE is 100 ppm. But a NIOSH Health Hazard Evaluation (requested by concerned workers) of an electronics plant in California concluded that TCE was toxic to workers in the printed wiring board unit section at a level generally under 50 ppm.³ (See Chapter 3B for how to request a NIOSH Health Hazard Evaluation.)

Twenty-four workers in the unit were interviewed by NIOSH physicians in December 1972. All but three had some symptoms which they attributed to their exposure to solvents. The NIOSH report stated that the most common symptoms of the workers were:

- (1) nausea (70.8%),
- (2) headache (54.2%),
- (3) dizziness (33.3%),
- (4) mucous membrane irritation (25.0%) and
- (5) fatigue and drowsiness (25.0%).

"All the workers felt that their symptoms were relieved completely when they had left work for several hours." ⁴

Workers submitted urine samples for study. TCE metabolites (break-down products) were found in the urine. The NIOSH report concluded that TCE was the only chemical present in high enough amounts throughout the work area to be suspected of causing the symptoms. The investigators felt that the condition was not a serious health hazard since "no permanent physical changes" occurred but that it could represent a potential safety hazard due to the worker's reduced physical capabilities and decreased ability to concentrate. ⁵

The NIOSH team also considered the hazards of other solvents (N-propyl acetate and toluene) but concluded that they were not toxic to workers at the plant studied. (See Part C for information on toluene.)

As a result of the Health Hazard Evaluation, NIOSH made the following recommendations for changes in the work conditions:

NIOSH RECOMMENDATIONS FOR USING TCE IN ELECTRONICS WORK⁶RECOMMENDATIONS

- 1) All spraying and washing operations with printed wiring board units should be completed inside properly functioning ventilation hoods. Workers must avoid spilling solvents outside of ventilation hoods.
- 2) Approved respirators should be used at the spraying and washing hoods and a respirator maintenance program developed.
- 3) To minimize exposure to trichloroethylene by wiring board unit testers, keep freshly washed boards in the washing booth until fairly dry by collecting several boards in the booth and then transferring them to the large drying racks rather than transferring each of them separately immediately after washing.
- 4) All ventilation systems should be serviced regularly; frequent ventilation measurements should be made.
- 5) To minimize the exposure to trichloroethylene by mass solder machine operators, the ventilation system should be checked for adequacy of design, especially the capture velocities and the presence of leaks.
- 6) For washing mass soldering machines, a less toxic solvent should be substituted for trichloroethylene. Also, approved respirators should be worn by the operators during the cleaning operation no matter what the type of solvent used.

OTHER HAZARDS

At a plant in California visited by one of the authors, chloroform and methylene chloride were both being used as solvents. (See Part C for more information on effects of these solvents.) Freon is reported by workers to be used as a substitute for TCE in some electronics plants. Methyl ethyl ketone, which has similar acute effects as TCE, is also used as a solvent.

Circuits are usually joined together by soldering with a lead-zinc alloy. Workshops should have exhaust ventilation since the fumes contain both lead and zinc oxide.⁷

Electronics workers interviewed by one of the authors stated that dermatitis (skin irritation, blisters, or cracking and reddening of skin) is a severe problem for many of them. For example, they often get severe rashes when using cyanide in plating. Epoxies used to mount crystals also cause skin irritation and sensitivity. Chloronaphthalene used as sheathing for capacitors can also have irritating effects on the skin. ⁸

TRAINING

Interviewed workers stated that lack of training is also a problem, since a wide variety of chemicals are used. Often a worker has to train a new employee and continue to perform her own job at the same time. This has occasionally led to accidents. Also, because of lack of training, new women employees have been injured their first day on the job when working with acids. Workers report that acid burns are a common occurrence in the electronics industry.

STATISTICS

Statistics in California show that women have a higher rate of occupational diseases than men in only a few manufacturing industries -- electrical equipment and supplies, instruments, and machinery. In fact, nearly one-half of all occupational disease reports for women in the manufacturing industry stemmed from manufacturing electrical equipment and supplies -- 2,133 cases out of 4,759 reported.⁹ (Although these reports are for all electrical manufacturing, reports from the electronics industry are included within them.) The most frequently reported occupational diseases in the electrical equipment and supply industry were "skin conditions", "eye conditions" (mostly splashes with chemicals), and "chemical burns."¹⁰

ACTION

- Read the above-mentioned NIOSH HEALTH HAZARD EVALUATION. To obtain a copy, write a letter to NIOSH and request -- under the Freedom of Information Act -- a copy of Health Hazard Evaluation Report 72-74-51, prepared by Melvin T. Okawa and Arnold Bodner. Ask for any other NIOSH reports on the electronics industry.

NIOSH
P. O. Building
Fifth & Walnut Streets
Cincinnati, Ohio 45202

- Union WAGE published a special issue (March - April 1976) of their bi-monthly newspaper on ELECTRONICS, covering union organizing efforts and health and safety problems. (P. O. Box 462, Berkeley, Ca. 94701).

CHAPTER 25

JOB: HOSPITAL AND OTHER HEALTH CARE WORKERS

Number of Women Employed: 3.2 million

% of Workers Who Are Female: 75%

SOME POTENTIAL HAZARDS: infectious diseases, such as hepatitis, tuberculosis, herpes simplex, and a multitude of other viral and bacterial diseases; heavy lifting, puncture wounds from needles, slips and falls, physical dangers (such as assaults by violent patients, electrical hazards, and emotional stress.

The following table shows a breakdown by occupation and sex of people employed in the health care industry:

TABLE 7: EMPLOYED PERSONS IN SELECTED HEALTH OCCUPATIONS
BY INDUSTRY AND SEX: 1970¹

Occupation	Total	Male	Female	Percent female
All industries				
All occupations	76,553,559	47,623,754	28,929,845	37.8
Specified health occupations	3,076,149	869,734	2,206,415	71.7
Pharmacists	109,642	96,610	13,032	11.9
Physicians	280,929	255,105	25,824	9.2
Registered nurses	829,691	22,332	807,359	97.3
Clinical lab techs	117,606	32,965	84,641	72.0
Health aides	118,907	18,305	100,602	84.6
Nursing aides	717,968	108,946	609,022	84.8
Practical nurses	237,133	8,485	228,648	96.4
All others	664,273	326,986	337,287	50.8
Health services industry				
All occupations	4,246,187	1,080,518	3,165,669	74.6
Specified health occupations	2,693,525	661,939	2,031,586	75.4
Pharmacists	13,417	9,856	3,561	26.5
Physicians	264,592	241,193	23,399	8.8
Registered nurses	745,861	19,996	725,865	97.3
Clinical lab techs	110,061	30,060	80,001	72.7
Health aides	110,481	14,174	96,307	87.2
Nursing aides	696,872	105,516	591,356	83.7
Practical nurses	229,068	7,660	221,408	96.7
All other	523,173	233,484	289,689	55.4
Non-health industries				
All occupations	72,307,412	46,543,236	25,764,176	35.6
Specified health occupations	382,624	207,795	174,829	45.7
Pharmacists	96,225	86,754	9,471	9.8
Physicians	16,337	13,912	2,425	14.8
Registered nurses	83,830	2,336	81,494	97.2
Clinical lab techs	7,545	2,905	4,640	61.5
Health aides	8,426	4,131	4,295	51.0
Nursing aides	21,096	3,430	17,666	83.7
Practical nurses	8,065	825	7,240	89.8
All other	141,100	93,512	47,598	33.7

Source: U.S. Bureau of the Census, *1970 Occupation by Industry*, 1970 Census of Population, Special Report PC(2)-7C, U.S. Department of Commerce, Washington, D.C., 1972, Table 8, (Based on 20 percent sample).

Health care institutions are complex organizations in which many workers do a variety of jobs ranging from direct patient care to laundry and maintenance work. Hospitals are the third largest employers in the U.S.; they employ approximately 3 million full and part-time employees. Although hospital workers represent a total payroll in excess of 16 billion dollars, they are still one of the lowest paid service occupations. Excluding doctors, the average income for health care workers in 1974 was slightly over \$6000 a year.²

In general, the bulk of hospital workers (excluding skilled professionals) are women and members of ethnic groups. Women have generally predominated in the health care area because of the low-paying jobs and because of the traditional, stereotyped, "nurturing" role of women. To a large extent, this employee profile accounts for industry-wide low wages, discriminatory employment practices, and minimal benefits.

Despite their mission, hospitals are not safe places for workers (or, as is becoming recently apparent, for many patients). A NIOSH study (based on questionnaires sent to 3,687 hospitals) reports a definite lack of adequate concern by the majority of hospitals about the health and safety problems of their workers. For example, over 30% of the hospitals reported they did not have a formal program providing occupational health care for their employees. And less than 40% of the hospitals required early reporting of pregnancy; and less than 15% reassigned pregnant workers to safer working conditions.³ The general lack of unionization of most hospital workers has allowed this situation to continue.⁴

Statistics show that accidental injuries have been increasing among hospital employees at an alarming rate.⁵ Strains and overexertion (primarily from supporting and lifting patients) head the list of common causes of injuries to hospital employees. One medical center in San Francisco found that 48% of their worker's compensation costs were for back injuries.⁶

In Sweden nurses are sometimes called "white miners" because of all the heavy lifting they must do. According to one European study, the nursing staffs of geriatric wards (where older patients are treated) are especially likely to suffer back injuries because these patients need more physical support than younger patients.⁷ Proper lifting techniques, assistance, and use of mechanical devices in moving patients or equipment could minimize the strain.

Other causes of accidental injuries include broken glassware and stray hypodermic needles, falls on wet slippery floors, inadequate lighting and electrical hazards. One in five nurse injuries in California in 1973 resulted from a fall. More than half were on wet or littered floors.⁸ (Certain hospital workers (e.g. office, lab, and laundry workers) have jobs whose hazards are covered in other parts of this Guide.)

Some sources of occupational illness in the hospital include:

BIOLOGICAL HAZARDS: Hospital workers risk infection by bacteria or viruses ("germs") as a result of direct patient contact, from tissues or blood samples, bed-linens, dressings, human wastes, or laundry.

Both viral hepatitis and tuberculosis occur more frequently among hospital employees than among the general population. A 1971 Swedish study discovered that the rate of hepatitis among hospital personnel was 15 times

higher than expected.⁹ In the United States hepatitis has spread from patients to staff in intensive care units, organ transplant units, hematology-oncology (blood & cancer) wards, and in the general medical-pediatric and surgical wards.^{10,11} Thus any hospital worker who has contact with blood or with patients who have hepatitis has a higher chance of being exposed to the hepatitis virus and thus of developing the disease.

Hepatitis can also be present in newborn babies if their mothers had hepatitis during pregnancy, particularly if the mother was infected during the last 12 weeks of pregnancy.¹²

Pregnant hospital workers may also be at special risk since many viruses or diseases have been associated with birth defects or with miscarriage following exposure during pregnancy. Among others, these include:

- cytomegalovirus (mental and hearing impairment)
- infectious hepatitis (can cause one type of mental retardation)
- mumps (can cause a heart defect)
- German measles (rubella) (can cause eye, ear and heart defects)
- shingles (herpes zoster) and chicken pox (varicella) (can cause eye and other defects)¹³

According to one study, there were defects in development of about one-half of all fetuses of mothers who had German measles during the first month of pregnancy. The percentage dropped if the mother had German measles at a later stage of pregnancy.¹⁴

A 1969 Canadian study found a higher incidence of birth defects among children of nurses (1) who had cared for babies with birth defects; or (2) who had cared for premature babies during their pregnancies; or (3) who themselves had some infection during pregnancy -- compared to other nurses without any of these jobs or health problems.¹⁵

RADIATION: X-Ray technicians, radiologists, and persons working with radioactive tracers are the hospital workers most likely to be exposed to ionizing radiation. (See Part C for a discussion of the health effects of exposure to radiation.) In addition nurses, aides and orderlies can be exposed especially during positioning of patients for portable X-rays.¹⁶ Kitchen workers or other food handlers can be exposed to leakage from faulty microwave ovens used to heat patient food.¹⁷ Improper disposal of radioactive syringes can expose housekeeping personnel.¹⁸

SKIN DISORDERS: Because of the frequent exposure to various drugs and cleansers, many nurses and housekeepers experience skin reactions (usually contact dermatitis).¹⁹ Many lab workers and pathology assistants develop irritations from chemical solutions. (Also see "Laboratory Worker" section.)

ANESTHETIC GASES: See Part C for the health effects of exposure to waste anesthetic gases (including disease and reproductive problems) on operating room personnel.

EMOTIONAL PROBLEMS: The staff of intensive care units work in very emotionally stressful situations due in part to the severity of the illnesses of the patients. A similar type of stress is also placed on emergency room personnel.²⁰

ASSAULTS BY PATIENTS: This is a particular problem in mental hospitals due to the disease process of the patient. However, this is also a risk of emergency room personnel as well as other areas of acute primary care.^{21,22}

OTHER: Electrical hazards from various types of equipment used in hospitals (particularly in intensive and coronary care units) are always present. So are the fumes and gases associated with some maintenance work like welding and painting.

(This is not an exhaustive list of hazards, but simply a sample of some of the more obvious ones.)

ACTION

- The following protective actions can be taken to make hospitals safer places to work:
 - * needle collection programs of disposable needles and syringes
 - * adequate sterilization and chemical disinfection procedures for infectious diseases
 - * lined garbage cans (to protect housekeeping personnel from disease hazards)
 - * compulsory maintenance of electrical equipment in good repair
 - * education on lifting techniques and adequate amount of lifting aids and devices
 - * foot pedals for sinks in laboratories (rather than operating faucets with contaminated hands)
 - * non-skid floors and non-slip shoes
 - * pre-employment examinations and vaccination plus adequate periodic re-evaluation of the health status of the workers specific to the health hazards they face
 - * record-keeping systems to monitor infectious diseases among hospital workers
- Some unions are actively organizing hospital workers and are also concerned about occupational safety and health. To mention a few: American Federation of State, County and Municipal Employees (AFSCME); Service Employees International Union (SEIU); Local 1199, National Hospital & Nursing Home Employees, an affiliate of the Retail, Wholesale and Department Store Union; and American Federation of Government Employees (AFGE).

Some of the staff people from these unions may be able to offer you assistance on health and safety problems. Contact people include:

* Charles E. Speiser, Director
Occupational Safety and Health
AFSCME
140 Park Place
New York, New York 10007

Rob McGarrah, Health Specialist Attorney
AFSCME
1625 L Street, N.W.
Washington, D.C. 20036

* American Federation of Government Employees
1325 Massachusetts Avenue
Washington, D.C. 20036

* Steven Hendrickson, Arlene Estraty
Local 1199
101 W. 31st Street
New York, New York

* Hellan Dowden
SEIU Local #715
715 N. First Street
San Jose, Ca. 95112

- Some unions have negotiated clauses on health and safety into their contracts. For example, SEIU Local #715 negotiated: (1) a hospital-wide safety committee on which union stewards sit (where formerly only management people met); (2) a county-wide hospital safety committee on which union safety stewards sit. As a result, union stewards now have access to medical reports about injuries and occupational illnesses among hospital staff that formerly were seen only by management. SEIU Local #715 (address above) will be happy to send any interested person a copy of their contract.
- Both CACOSH and PhilaPOSH have members who are interested in working on the occupational health and safety problems of health-care workers. The addresses for these two groups are in Part E.
- Write NIOSH for a copy of their results from the nationwide survey of 3,700 hospitals, Hospital Occupational Health Services Study, Parts I-VI. Address is in Appendix B.
- Obtain the compilations of injury statistics among hospital employees in California.
 - * Work Injuries in California
July 1975 & October 1975
Division of Labor Statistics & Research
P.O. Box 603
San Francisco, Ca. 94101
- See the next section for more information on laboratory hazards.

CHAPTER 26

JOB: LABORATORY WORKER

Number of Women Employed: 125,000 (includes technologists, technicians, assistants, and scientists)¹

% of Workers Who Are Female: 83%

SOME POTENTIAL HAZARDS: exposure from equipment emitting radiation (e.g. X-rays), and exposure from radioactive isotopes, broken glass, a variety of biological agents (such as infectious bacteria, viruses, and parasites) and numerous substances that can be flammable, explosive, toxic or carcinogenic, shock from electronic and electrical equipment, and bites and allergies from research animals.

Laboratory workers -- technicians, scientists, clean-up workers -- are all exposed daily to a variety of health hazards in doing laboratory tests and in conducting experiments. Because of the size, variety, type and complexity of scientific laboratories, it is difficult to categorize the potential hazards to the workers.

There is frequently a gross disregard for safety in many laboratories. Often, the lab research is at the frontiers of knowledge, and thus laboratory personnel are the first to be exposed to new dangers. Also, most academic institutions do not teach science students about the toxicology of chemicals; thus graduating students enter the field with little appreciation for the potential hazards.²

There are no nationwide standards (other than those for a limited number of substances under OSHA and for certain radiation exposures under NRC and ERDA*) for the regulation of hazardous conditions in laboratories. Many laboratories use the Threshold Limit Values (TLV's) (see Part C) as guidelines for airborne concentrations of hazardous substances, but "it is the general opinion of persons dealing with laboratory safety that laboratory personnel are often not aware of the problems and dangers." ³

Several of the carcinogens regulated under OSHA (see p. A-28) have laboratory uses. For example:

aminodiphenyl -- used in cancer research

benzidine -- used to identify occult blood and as a stain

4-dimethylaminoazobenzene -- used in Topfer's reagent

beta-propiolactone -- used as fumigant and disinfectant and to make vaccines

Moreover, laboratory personnel who are testing chemicals for their carcinogenicity may be exposed to cancer-causing chemicals themselves if proper laboratory precautions are not observed. One study showed a higher than expected incidence of lymphoma (cancer of the lymph tissue) and pancreatic cancer among professional chemists.⁴ Lab technicians would presumably be exposed to many of the same hazardous agents as the chemists.

In California, Cal/OSHA has taken action to see that high school laboratories cease using any of the 14 carcinogens for laboratory experiments. This action emanated from the discovery in Kentucky that some of these chemicals were being routinely used in high school laboratory experiments.⁵

* The Nuclear Regulatory Commission and the Energy Research and Development Administration, formerly called the AEC.

Benzene, an extremely hazardous chemical (see Part C) is reported to be widely used as an organic solvent in laboratories.⁶ Several other agents used in laboratories have been implicated as teratogens (that is, they are known to cause birth defects in humans or in experimental animals). According to recent articles, these include mercury, carbamate compounds, diazo dyes such as Evans Blue, Niagra Blue, Congo Red, and Janus Green B, Triton, sodium arsenate, lead, phthalic acid esters,⁷ selenium,^{*8} and cyclohexanone.⁹

Antibiotics that are used in some laboratory experiments may cause allergic reactions.¹⁰ Three antibiotics are known teratogens: Actinomycin D, streptomycin, and mitomycin C.¹¹

Dioxane (diethylene dioxide) is a dehydrating agent used in the preparation of histological slides. Vapors can escape during the automated tissue preparation process. Although it does not irritate the skin, it can irritate the eyes. But the more serious dangers lie with the liver and kidney damage that dioxane can cause.¹²

It has long been recognized that workers can and do become infected with microorganisms being used in the laboratory. For example:

- " -- there have been almost 3500 documented overt laboratory-acquired infections reported.
- 160 persons have died from proven laboratory-acquired infections.
- reports of laboratory-acquired infections are increasing in number, in spite of better knowledge of the problem and improved containment facilities." ¹³

A 1973 review of laboratory hazards warned of the association between viral infection and fetal malformations. Based on either animal studies or

*There is only one case study of selenium teratogenicity in humans; among eight women working in a media culture lab, four definite and one probable pregnancies occurred. All except one ended in miscarriage; in the other, the child was born with club feet.⁸

human experience, the following viruses have been implicated as teratogens (that is, they cause birth defects in humans or animals): German measles (rubella), mumps, chicken pox (varicella), shingles (herpes zoster), measles, infectious mononucleosis, cytomegalovirus, virus used to vaccine against small-pox (vaccinia), and influenza.¹⁴

Research in laboratories using these or other viruses -- particularly in cancer research -- poses special hazards. A former research laboratory technician reported that the following were commonplace in her lab: haphazard clean-up of virus spills; crowded conditions making careful techniques difficult; little precaution about virus being sprayed about the lab; routine mouth pipetting of dangerous viruses; workers eating lunch in the midst of the laboratory; plus the added potential hazard of broken glassware containing virus in the centrifuge

In addition, the lab technician reported that few precautions were used in handling some of the dangerous chemicals used in the laboratory. There was disregard for using the available exhaust hoods when working with chemicals. Furthermore, she also reported inadequate precautions taken with some of the radioactive materials used in the research: mouth pipetting was commonplace; adequate protective clothing was not provided and the "protective" clothes provided were not utilized; personnel monitoring (use of film badges) was haphazard; and solutions with radioactive isotopes were frequently washed down sink drains.¹⁵

Statistics in England show that tuberculosis is more common among laboratory technicians than in the population at large.¹⁶

Many clinical laboratories in which blood is used have had an increased incidence of hepatitis among lab personnel.* This is especially true at blood

* For example, 32 cases of hepatitis were found among clinical lab personnel at one hospital during a 3 1/2 year period.¹⁷ All of them routinely handled blood products.

banks. Common exposures are accidentally pricking the skin with contaminated instruments, pipetting infective fluids, contaminating cuts or scratches with infective blood or splashing it into the eyes or mouths.¹⁸ The following safety precautions eliminated hepatitis infections at one laboratory:¹⁹

- * Use of disposable gloves when handling possibly infected sera or microbiological plates
- * Disposable pipets or pipet tips
- * No mouth pipetting allowed
- * Testing performed under a Fiberglas hood when possible
- * Installation of a closed system for disposal of potentially infectious wastes
- * Autoclaving of trash and used utensils, plus cleaning up of spills with phenol or chlorox

Lab workers who have medical conditions which necessitate taking immunosuppressive drugs (such as cortisone or azathioprine -- Imuran) run an increased risk of bacterial or viral infections, because the drugs may decrease their body's ability to fight infections.²⁰

ACTION

-- In addition to those described above, the following precautions should be taken in all labs: ^{21,22,23}

- * adequate protective clothing, usually separate from street clothes
- * no eating, drinking, smoking except in defined clean spaces
- * adequate ventilation for hazardous substances
- * special clean-up precautions and procedures for hazardous substances
- * available eye washes and contamination showers
- * fire extinguishers available
- * no mouth pipetting of hazardous substances
- * adequate measures for routine clean-up

- You should learn about the possible hazardous effects of all chemicals with which you work -- more than just the explosive limit. The following books can prove useful:
 - * Dangerous Properties of Industrial Materials, Irving Sax, New York, 1968.
 - * Industrial Hygiene and Toxicology, Frank Patty, Vol. II, New York, 1963.
 - * Hazards in the Chemical Laboratory, edited by G. D. Muir, Oxford, England, 1971. (Distributors: Chemical Society Publications Sales Office, Blackhorse Road, Letchworth, Herts. SG61HN England)
 - * Lab Safety at the Center for Disease Control is a manual that describes safety procedures at laboratories operated by the federal CDC. Write: Office of Biosafety, CDC, Atlanta, Ga. 30333.
- "Safety in the Laboratory" is a five-day course offered by NIOSH. (The course manual is NIOSH Manual #580). Write Chief, Environmental Management Branch, NIOSH, 550 Main Street, Cincinnati, Ohio 45202.
- You should routinely request a print-out of your exact levels of radiation exposure recorded on your film badge. Do not just accept your employers' telling you that your levels are within the allowable limits.
- According to the Department of Labor's magazine Job Safety and Health, some organizations representing lab employees are developing an interest in health and safety. The following was cited as one example in a May 1975 article:
 - *Local 1199, National Union of Hospital and Nursing Home Employees, includes many lab employees among its 100,000 members and works with three NYC hospitals to improve conditions in labs. Judy Berek is the coordinator of health professionals.

-- PART E --

SOME WAYS TO RECOGNIZE HAZARDS
AND MAKE CHANGES AT YOUR WORKPLACE

CHAPTER 27

"MEATWRAPPERS' ASTHMA: "

AN EXAMPLE OF HOW ONE LOCAL UNION HEALTH AND SAFETY
COMMITTEE GOT ACTION ON A JOB HEALTH HAZARD

Background: According to workers in the industry, about 98% of the country's 75,000 meatwrappers are women. In wrapping operations of retail establishments, polyvinyl-chloride (PVC) film is normally used to package meats. The operator pulls the PVC from a roll, wraps the meat on the table part of the meat-wrapping machine, pulls the package down and cuts the film on hot wire, finishes wrapping the package, and seals it on an electrically heated pad.

In 1973 a scientific article appeared in the Journal of the American Medical Association about an illness of three Los Angeles meatwrappers.¹ The women had experienced shortness of breath, wheezing, and coughing while at work as supermarket meat wrappers. The condition improved on days they didn't work. The fumes (decomposition products of the PVC film) generated by the hot-wire cutting of the film were implicated in the respiratory distress suffered by the women.*

Newspapers carried reports about the illness. Members of San Francisco's Butchers' Local #115 (of the Amalgamated Meatcutters and Butcher Workmen of North America) noticed these reports. Described below is the way they responded over a 1 1/2 year period to the health hazard that appeared

* Over 8 different chemicals and gases are released when the PVC film is cut with a hot wire.²

as a threat to their membership:

1. After they cut out the newspaper story, the meatwrappers tracked down the medical journal article to read it for details.
2. The meatwrappers in Local #115 began talking to each other about the condition and discovered that some of them had also suffered similar symptoms.
3. A few other articles appeared in the newspapers about similar health problems among meatwrappers in the Pacific Northwest, so the union members started a file. Oregon researchers said that 67 out of 96 meatwrappers studied had some sort of irritation or breathing problems.³
4. In response to the apparent health hazard faced by their members, some of the union members decided to form a health and safety committee. It was the first rank and file committee of its kind formed among meatwrappers and butchers in the Bay Area.
5. The committee began to investigate the hazards at their own supermarkets and found many women with health problems that were similar to those reported in Los Angeles.
6. The committee invited a doctor from the University of California Medical Center to speak at a union meeting about the possible hazards of the decomposition products of the PVC when it was heated. (These include phosgene, hydrochloric acid, and carbon monoxide.)
7. Nationwide stories appeared in the press and on television about the discovery that vinyl chloride causes a rare kind of liver cancer among exposed workers. Meatwrappers feared that their illness might be caused by vinyl chloride being released from the polyvinyl chloride film wrapping -- which was made from vinyl chloride.
8. The union committee decided to develop a questionnaire and circulate it among their members to determine their health experience. They sought help from the university in designing the form.
9. After the questionnaires were returned the results were tabulated. Of 200 returned, 60 people reported some sort of respiratory problems. The results were published in the union newsletter.

10. Nearly every month the union newsletter contained one or two articles about meatwrappers' asthma, the committee's progress, as well as an update about vinyl chloride hazards.
11. The union health and safety committee recommended, and the membership voted to approve, paying normal meatwrapper's wages to the secretary of the committee for two months so that she could work on the health study for the union members.
12. Concerned committee members filed a complaint with the California Division of Industrial Safety (which enforces CAL/OSHA, the California state plan for occupational health and safety). But the committee did not receive a response. So the health and safety committee organized a "CALL-IN" to the DIS to demand that an inspection be done. Their tactic was successful; the inspection was performed. The DIS required some of the stores to switch to mechanical devices from hot-wire cutting.
13. The committee organized a Meatwrappers Conference, sponsored jointly by Local #115 and the Western Federation of Amalgamated Meatcutters and Butcher Workmen of North America, at which environmental, consumer and workers health issues were all discussed. A panel of experts -- some from other parts of the country and from other unions -- spoke about the hazards of PVC film and of vinyl chloride. Ways to control the exposures were emphasized.
14. As a result of information circulated to members by the committee, some of the meatwrappers fought for changes in their supermarkets. As a result, some markets have installed mechanical cold-wire cutting or mechanical blades to replace hot wire cutting; since these are believed to be safer than the hot wires. Some other meatwrappers who were being disabled by the fumes decided to leave the line of work.

More recent studies in other parts of the country have found similar kinds of health problems among meatwrappers. In some severe cases, symptoms have forced workers to quit their jobs. A March 1976 article⁴ reported on a study of 145 meatwrappers from 152 supermarkets near Houston, Texas. About 10% had a combination of wheezing, shortness of breath, and pain or tightness in the chest. Many more had less serious irritations, such as eye, throat or nose irritation. Meatcutters and unexposed checkers had signifi-

cantly fewer problems.

Out of the 145 meatwrappers, 17 worked with mechanical blades instead of hot-wire cutting machines. None of these 17 had experienced any symptoms of respiratory distress. The authors emphasized that they felt the best solution to the problem was the use of a mechanical blade.

Another March 1976 article⁵ discusses fumes released from the heat-activated price label adhesives that are used on wrapped packages of meat. The authors blamed the price label fumes for the "meatwrapper's asthma" seen in a male meatcutter.

To this day, no one is positive exactly which of the decomposition products from the film or the price labels -- if any -- is the culprit in "meatwrapper's asthma."⁶

* * *

Other local unions have also been actively trying to protect their members against the fumes from the PVC film. For example, a local union health and safety committee in Philadelphia (Meatcutters Local #196) has urged its union to fight in contract negotiations for a ban on the use of hot wires to cut the PVC film.⁷

There are also several "meatwrappers' asthma" class action suits around the country, including one in Cleveland where 284 meatwrappers⁸ are suing the manufacturers and distributors of PVC film wrap.

CHAPTER 28

OTHER IDEAS FOR ACTION ON HEALTH AND SAFETY

What can workers do if they suspect or recognize hazards on the job that threaten their own health, that of their developing children, or that of their coworkers?

The activities of the meatwrappers described in the preceding chapter illustrate the way that many local union members have first gotten involved in investigating and fighting hazards. This chapter will outline some additional health and safety activities that can be initiated by local unions. The ideas are also useful for groups of non-union workers, although fighting for changes in a non-union workplace involves a much more difficult struggle.

Workers are encouraged to read about specific hazards on their jobs in *WORKING FOR YOUR LIFE*; to study the ACTION sections at the ends of the chapters in the Guide (see pages A-18, 24, 29, 33; B-15; D-9, 17, 24, 35, 42, 48; E-1); and then to use this chapter for additional general ideas on how to get information about hazards and how to correct them.

COLLECTING GENERAL INFORMATION ABOUT HEALTH AND SAFETY

---Learn about the effects of job hazards and ways to eliminate them. Start with *WORKING FOR YOUR LIFE*; obtain some of the other books mentioned on page A-29 of this Guide. See if your local library has books on health and safety or if your international union has any that it can lend to your local.

---Write for some of the occupational health newsletters and publications listed on page E- 32 and some of the reports and pamphlets in the ACTION sections.

---Write to NIOSH and ask for a list of their CRITERIA DOCUMENTS (such as toluene, noise, carbon monoxide). Order those covering hazards to which you are exposed. Also ask NIOSH to place you or your local union on its mailing list for HEALTH HAZARD ALERTS (background information issued by NIOSH when it learns new information about serious hazards from exposure to chemicals).

---Become familiar with the federal Occupational Safety and Health Act of 1970 (and with your state legislation if your state has taken over enforcement of occupational safety and health -- see Appendix A). Obtain copies of the federal law from the Regional Office of OSHA (see Appendix C) and ask OSHA for copies of the OSHA standards.

---Read HOW TO USE OSHA by Urban Planning Aid (see page E-33); it is the most readable pamphlet on how to exercise your rights under the law.

---Contact some of the university and public interest/action groups listed on pages E-32-33. The "COSH" groups are committees on occupational safety and health composed of union locals, medical and technical people, and pro-labor lawyers. Many of the groups listed can provide you with information on health and safety problems. Most of them have had extensive experience in working through health and safety problems and can advise you on strategies. Some of the groups train workers in health and safety and hold monthly meetings and conferences on health and safety issues.

If there are no groups listed from your area, try to contact a local environmental group, student public interest research group, or a community group. Often there are people in these groups who are very knowledgeable about toxic substances.

---Write to the Society for Occupational and Environmental Health and ask about obtaining a copy of their transcript from the June 1976 occupational health conference on "Women and the Workplace." (Write to Vicki Bor, P.O. Box 28303, Central Station, Washington, D.C. 20005).

COLLECTING INFORMATION ABOUT HAZARDS AT YOUR OWN WORKPLACE

---Conduct a survey of health and safety hazards at your own workplace. Section A of this chapter contains some samples of forms that have been successfully used in surveying hazards. Have all workers participate in filling them out.

---Collect your own information on the numbers of job-related injuries and illnesses in your department, plant, or office. Carefully document the cases for your own files. If someone is injured on the job or becomes ill as a result of job exposures, encourage them to ask your employer to show them the "Supplementary Reporting" forms that describe the injury or illness. (These forms are required by OSHA to be filled out in the event of job-related injury or illness). Ask your employer for a copy of the Annual Summary of Occupational Injuries or Illnesses that is required to be posted in each workplace for one month during the year (February).

---Start a health and safety file. Keep articles about health hazards from newspapers and other sources. Keep copies of all individual or local union correspondence with management, government, laboratories, manufacturers, etc., that deals with health and safety issues. Be sure that every action you take is carefully documented and filed for future reference.

---A number of international unions now have full-time staff people who deal with health and safety. For example, the UAW has 6 - 8 full-time health and safety staff members; the Steelworkers have a full-time (woman) industrial hygienist; the Rubber Workers have two industrial hygienists, one of them a woman; OCAW has an industrial hygienist and other staff working full-time

on health and safety problems of its members. Local unions should write to their internationals to request help on health and safety problems. If the local unions face many job hazards, they should encourage their internationals to hire staff people who can assist in helping to correct the hazards.

---If your international union cannot provide the necessary assistance, you might contact a medical or safety expert to tour your worksite to evaluate it for hazards. (Some of the groups in Section C can provide names.)

**An audiologist was called in by the printing pressmen at a newspaper in D.C. to measure the noise levels in the pressroom.

**Women at a pharmaceutical warehouse in California requested a walk-through inspection by an industrial hygienist from the Labor Occupational Health Program, after several women workers had become ill while at work.

---Request a NIOSH Health Hazard Evaluation if you are concerned about hazardous exposure to potentially toxic substances in the workplace. Requests must be made by authorized employee representatives -- either union reps or workers who have written authorization from two or more employees in the work area where the potentially toxic substance is normally found.

NIOSH then surveys the workplace, takes environmental samples, interviews workers, sometimes medically examines workers, and then makes a full report of the study. The report includes recommendations for controlling hazards, if appropriate. (See p. D-33 for an example). NIOSH does not issue citations or levy fines.

---Keep records on the pregnancy experience of women workers and the wives of male workers. Use QUESTIONNAIRE #3 on page to do the surveys.

QUESTIONING YOUR EMPLOYER

---Ask your employer to provide you with evidence that substances are safe before you begin working with them.

---Request the actual chemical names (as opposed to trade names) of all the substances to which you are exposed. Look up the hazards in WORK IS DANGEROUS TO YOUR HEALTH or other books and reports on chemical hazards.

---Request information about the hazards of all the substances with which you work, including cancer, genetic effects, and birth defects. Ask your employer for copies of information on the toxicity of these substances. Check this information to see if it corresponds to what you have been able to learn on your own.

--- If you are working with cancer-causing substances, ask your employer if safer substitutes are available. If these substances must be used, ask your employer for evidence that workers are not being exposed on the job to these chemicals or physical agents.

---Ask your employer to monitor the levels of toxic substances in the air and to let you have access to the results (some of the OSHA standards already have specific requirements for monitoring--for example, vinyl chloride and asbestos). If the levels are high and your employer does not indicate that the hazard will be abated soon -- or if he does not let you have access

monitoring data and you suspect there are violations of standards -- you should request an OSHA inspection.

QUESTIONING THE COMPANY DOCTOR OR NURSE

---When you go to the company doctor for an illness, make sure he or she knows exactly what you're exposed to on your job. If there is no company doctor, tell the nurse. Be sure that your personal physician also is aware of your present and past workplace exposures. Very few doctors have received any training in occupational medicine; most doctors will never ask you any details about your work, so be sure to volunteer the information.

---Keep a written record in your own files of all the job exposures you have had to chemical, biological, and physical hazards. Pass this information on to your doctor.

---Any time you see the company doctor or nurse and have medical examinations or tests performed, ask that your medical records be sent to your own personal physician so that your doctor has a complete, ongoing, record of your medical history. In this way, your own doctor can give you an independent interpretation of the results of tests and exams done by the company to see if your illness is related to your workplace exposures.

---Request the results of all medical examinations and tests performed by the company or by medical personnel that it hires. Do not be content with their telling you that "your lead level is within the allowable limit" or that your screening tests show that you have "not had very much exposure to carbon monoxide." Ask for written results for your files; if these cannot be directly obtained, ask that they be sent to your personal physician.

---If the union wants to determine if its members are suffering from an increased incidence of disease due to occupational exposures, or if the union is dissatisfied with the medical surveillance that the company is providing, it can request the assistance of independent physicians who specialize in occupational or environmental health.

The following organizations/physicians have in the past been utilized by labor unions to provide independent review of worker health and medical records; some of them might be willing to work with your union on health and safety problems: **Johns Hopkins School of Public Health (Dr. Edward Radford)

**Mt. Sinai Environmental Sciences Laboratory, New York
(Dr. Irving Selikoff)

**Harvard School of Public Health (Drs. David Wegman and John Peters)

**University of Illinois School of Public Health (Dr. Bert Carnow)

**University of Pittsburgh (Dr. Thomas Mancuso)

**Labor Occupational Health Program (Dr. Donald Whorton)

**Health Research Group (Dr. Sidney Wolfe)

**Labor Environment Health Institute (Los Angeles) (Dr. James Dahlgren)

(For the final version of this GUIDE, we would like to obtain a list of other doctors who are interested in providing services to labor organizations.)

---If you suspect that there is an unusual incidence of disease among workers at your jobsite that might be related to your job exposures, contact NIOSH for advice on the problem.

---Ask your company doctor to provide you with information about the toxicity of the chemicals that you work with and to advise you about whether they can harm the developing fetus if you are exposed to them during pregnancy.

ORGANIZING FOR HEALTH AND SAFETY

---Organize local union health and safety committees to improve the workplace environment.

---In non-union workplaces, organize groups of workers interested in health and safety into committees to look at health and safety problems.

**For example, unorganized electronics workers at a plant in California formed a health and safety committee and developed leaflets on job hazards which were circulated to workers.

---Organize coalitions of workers and families interested in health and safety problems to improve the workplace conditions and to assist the victims of occupational disease.

**Brown Lung and Black Lung Associations have been organized to insure better medical care and benefits for workers who have developed lung disease as a result of their work in cotton mills or coal mines.

**In England, a coalition has been formed of family members of asbestos workers. It aims to prevent asbestos disease by improving working conditions, to improve medical care, and to provide support for victims.

**In Philadelphia a Coalition of Widows was formed after many workers died from exposure to BCME, a cancer-causing chemical, at the Rohm and Haas Company. When the widows acted collectively, they were able to obtain worker's compensation (death benefits), whereas prior to their action the company had been fighting individual claims.

---Organize health and safety committees in local chapters of the Coalition of Labor Union Women (CLUW).

---Have labor groups meet with community and environmental groups to discuss ways that health and safety problems on the job are intimately related to general environmental pollution and to community concerns; find ways for these groups to work together on mutual concerns.

FORMING A HEALTH AND SAFETY COMMITTEE

---Union health and safety committees, or labor representatives on joint union/management committees, should perform the following functions:

- **Conducting surveys of workplaces and investigating hazards & accidents
- **Informing management of health and safety hazards and setting deadlines for completing the corrections of hazards
- **Filing OSHA complaints on behalf of the membership (and following these through with walkaround during inspections, filing appeals, etc.)
- **Educating membership about hazards and communicating to the local members about actions taken
- **Keeping records of all actions taken to correct hazards (such as timetables for completion, OSHA complaints, copies of grievance forms); keeping records of all air monitoring and summaries of medical exams and tests of workers.
- **Training (or arranging for the training) of shop stewards and business agents or business representatives
- **Input to OSHA hearings and committee meetings
- **Maintaining files on illnesses and injuries suffered by members that are believed to be job-related; seeing that the local union keeps records of death experience of members
- **(Most of the other activities described in this Chapter can be performed by local union health and safety committees).

---Some unions have full-time health and safety committee people

- **For example, the International Association of Machinists, Local 1781, and various locals of the UAW.

---If your local doesn't have a health and safety committee, write for Bob Fowler's 18 page description of how to form one and what its functions should be. (Labor Occupational Health Project publication, address on back cover).

EDUCATING WORKERS

---Circulate any of the pamphlets, books, or other information that you obtain about hazards to other workers in your plant or department.

---Use the local union newspaper as an outlet for information about health hazards. If there is no newspaper, circulate leaflets that describe the hazards. The newsletter can be used to summarize the results of health hazard surveys conducted in the workplace or filled out by the workers.

--Ask a sympathetic medical doctor to write a monthly column on health and safety problems for your union newsletter. Or reprint other "Dear Doctor" columns.

**Dr. Thomas Mancuso writes a question and answer column in THE MACHINIST. Dr. Donald Whorton writes one in the LOHP newsletter MONITOR. Drs. David Wegman and John Peters write a column for the JOB HEALTH NEWS SERVICE. (See page E- 34 for addresses for these publications)

---Schedule an introductory session on health and safety at a regular union meeting. Show the Urban Planning Aid slide show "All in a Day's Work" to give members background on historical hazards and on the various ways that work can be dangerous to your health. (The slide show is 20 minutes long, has 80 slides, and comes with a script available in both Spanish and English). OCAW has a slide show on lung disease. (See page E- 33 for addresses).

---Schedule a special training session for workers covering legal rights and health hazards. This might be a one or two hour session, as a start. Ask medical experts or people from some of the groups listed on pages E32 - E33 to speak about hazards that you face on the job and to conduct a question and answer session about hazards and the medical tests that should be given to detect job-related diseases.

**OCAW has held training sessions all over the country for its members

**Other examples include evening and weekend training sessions held by a variety of local unions in the San Francisco Bay Area in 1976: ILWU (longshoremen); ICWU (chemical workers); UTU (railroad workers); Operating Engineers; and others.

**Over 100 representatives from local union health and safety committees attended a 2-day training session in California in January 1976 where the Labor Occupational Health Program staff conducted workshops on medical screening, OSHA, how to monitor for hazards, how to have an effective health and safety committee, workers' compensation, and collective bargaining for health and safety.

---Schedule a follow-up training session and ask someone to speak about how to monitor and control workplace hazards, so that union members can:

1. learn about monitoring equipment and how to monitor for contaminants.

**Some local unions have bought monitoring equipment and taught members how to use it. Dust sampling was conducted by OCAW members at a molybdenum mine (where both men and women were employed) in Colorado. Workers had been trained in how to monitor by OCAW staff members.

2. learn about control techniques that can abate the hazards in the workplace and learn about the proper kinds of ventilation needed.

3. Learn about the kinds of personal protective equipment available to help protect workers (as long as they understand that most of these devices should be used only as as last resort if engineering controls fail to reduce exposures.)

---Show films at a local meeting as a way to dramatically visualize health and safety problems on the job. By seeing other hazardous job situations, workers are more likely to talk about the hazards they face themselves. Even if the workers who see the film do not work in the same industry that has been filmed, they can still learn from the experiences of other workers who have suffered the results of unsafe workplaces.

Films are a good way to stimulate lively discussion around health hazards. Page E-34 lists some recent films that are available (by purchase or rental).

USING COLLECTIVE BARGAINING

---Examine your contract for existing clauses that require your employer to provide a safe and healthful workplace.

---Consider stronger demands in collective bargaining, such as specific contract language to provide transfers for pregnant women to safer jobs during pregnancy with equal pay and all benefits preserved; provisions for day care; provisions for special medical surveillance if certain toxic substances are used.

---The following are examples of health and safety clauses taken from collective bargaining agreements in California (not actual language):

****Employees shall be informed of the hazards involved in use of toxic substances on the job and the protective measures that are being taken (United Steelworkers of America)**

****The designated employee representative who accompanies an OSHA inspector on a walk-around inspection shall be paid for the time lost from the regular shift (United Rubber Workers and Oil, Chemical and Atomic Workers)**

****The health and safety committee shall have access to a company file containing information about the protection required when using hazardous substances in the plant (International Chemical Workers)**

****Applicators of organophosphate pesticides shall be given cholinesterase tests (tests to determine whether pesticides have interfered with ability of the nerves to work properly) (United Farm Workers)**

****Binderries must be ventilated so that the air will not injure anyone who works there (Graphic Arts Union)**

****The above examples of contract clauses are adapted from the Labor Occupational Health Program pamphlet CALIFORNIA NEGOTIATED CLAUSES FOR HEALTH AND SAFETY by Morris Davis. (Write to LOHP, address on back cover).**

---Several international unions have negotiated special health and safety provisions in their contracts which can have far-reaching results:

****The UAW's (auto workers) 1973 contracts with the major auto manufacturers resulted in having full-time local union health and safety representatives in each plant who are specially trained by the union to conduct weekly plant inspections.**

****The URW (rubber workers) in 1970 wrote a "cents-per-hour" agreement into their contracts with the six major tire manufacturers to pay 1/2 ¢ per hour per worker into a fund for occupational health plant surveys and studies of disease among the workers. (The studies are being conducted by Harvard and North Carolina Schools of Public Health).**

USING THE GRIEVANCE PROCEDURES

---Your employer is required to provide a safe and healthful workplace under the general duty clause of the Occupational Safety and Health Act. If your employer does not provide a safe and healthful workplace, or if the employer refuses to abide by a clause in your contract that covers health and safety, you have the right to file a grievance.

****A local of the International Ladies Garment Workers Union in San Francisco has sponsored an 8 week course (one night a week) in grievance procedures for their shop stewards. One evening session was devoted to occupational safety and health.**

*****The Oil, Chemical and Atomic Workers Union won two arbitration cases that resulted from grievances over health and safety problems in chemical plants. A local union at a Ciba-Geigy plant in McIntosh, Alabama, won the right to be given the actual chemical names (as opposed to trade names) of all the chemicals used or produced in the plant. In a second case, workers at an Arco Polymers plant near Pittsburgh won the right to have doctors other than the company doctor look at the results of blood tests that were being performed because of exposure to benzene. (Copies of these decisions can be obtained from OCAW, 1126 16th Street, N.W., Washington, D.C. 20005).**

USING RIGHTS UNDER THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)

---Exercise your rights under OSHA. Some of the most important rights include your right to:

****File a complaint** (See Urban Planning Aid's HOW TO USE OSHA)

****File a complaint with the Labor Department** if you are discriminated against in any way for exercising your rights under OSHA (e.g., if you are fired or disciplined for having filed a request for an OSHA inspection).

****Accompany an inspector** around on an OSHA inspection

****Observe monitoring and have access to exposure records**

****Challenge the abatement period** (the length of time allowed to correct the hazards) when your employer is issued an OSHA citation. Get involved in cases that your employer appeals by "electing party status."

---Obtain a copy of WINNING AT THE REVIEW COMMISSION, A Worker's Handbook On Enforcing Safety and Health Standards, by Bertram Cottine. Published by Health Research Group, address on cover.

****Participate in hearings**

---Be sure that your union and your interests are represented at standards-setting and advisory committee hearings and meetings in Washington, D.C.

---International unions have had staff members or local union members testify at all major hearings on new occupational health standards in Washington, D.C. Unfortunately, few workers other than union staff are usually able to take the time off of work to testify during the day. Try to ask for night hearings or hearings on Saturday when workers will more likely be able to present testimony.

****File CASPA complaints** (Complaints Against State Program Administration)

---Provisions in the Occupational Safety and Health Act of 1970 allowed states to assume authority for job safety and health if the state program was "at least as effective" as the federal. (See Appendix A to see if your state has a "state plan.")

If you are dissatisfied with the state's performance in enforcing regulations and administering the state's program you can file a CASPA complaint form with the Regional Office of the Occupational Safety and Health Administration, Department of Labor. (Addresses in Appendix C).

The official position of the AFL-CIO is that the federal government should have jurisdiction over the enforcement of health and safety, rather than having the states take over

the administration. In several states, labor unions and public interest groups have urged that the state plan be withdrawn when there was evidence that the state program was not effectively protecting workers.

--Be sure that you keep carefully documented records of all OSHA-related activities.

FILING LEGAL ACTIONS

--In conjunction with your national or international union, file petitions with federal OSHA asking for stricter standards to protect workers. Unions can also file petitions with the appropriate state agencies in states that have "state plans." File legal actions if the state or federal agencies fail to act on your petition, or if the standards that are issued are inadequate to protect workers.

**The OCAW, in conjunction with the Health Research Group, petitioned the Department of Labor, OSHA, to set strict standards for certain cancer-causing chemicals. When OSHA failed to take action within a reasonable period of time, the organizations sued the Department of Labor to compel them to issue the standards. When the standards were eventually issued, the groups sued the Labor Department because of the inadequacy of the provisions.

**The Textile Workers Union, in conjunction with the North Carolina Public Interest Research Group, filed a legal action against the Labor Department in 1976 to compel the Department to issue a new standard for exposure to cotton dust.

--File EEOC (Equal Employment Opportunity Commission) complaints or complaints with your state's Human or Civil Rights Commission if you are told that you cannot work at a particular job unless you can prove that you are no longer capable of bearing children. (See page A-40 for several case examples).

**At a plant of the St. Joe's Mineral Corporation in Pennsylvania women workers have been told that they can work with lead only if they can prove that they are no longer capable of bearing children. The use of lead is widespread throughout the plant. Some of the women have filed a complaint with the Pennsylvania Human Rights Commission on the grounds that the company's action constitutes sex discrimination. The case is scheduled for hearing in August, 1976.

--Workers' compensation laws generally prohibit workers from suing their employers when they are injured or made ill as a result of job conditions or exposures. But workers can sue "third parties" -- another person or company involved in some way in having produced the injury or illness.

**A 27 year old apprentice won \$4.7 million for injuries suffered in an industrial accident in California. A pipe had fallen on the victim, paralyzing him from the chest down. The jury found that

an engineering company was liable as the general contractor that constructed the building where the accident occurred. It also found a steel company responsible for having cut an iron brace improperly, allowing the pipe to fall.

****An asbestos worker at a Johns-Manville plant in California won a \$350,000 settlement of a case against a doctor who had been contracted by J-M to do annual check-ups of workers at the plant. The worker argued that the doctor had read the worker's x-rays, had known that he was developing asbestos-related disease, but that the doctor had not informed him. He sued the doctor for malpractice and won.**

****An asbestos insulation installer who developed asbestosis after working with asbestos was recently awarded \$200,000 in a lawsuit filed against Johns-Manville, as manufacturer of the insulation (and not the employer of the insulation worker.)**

GETTING PUBLICITY

--Use your local union newsletter to circulate information to your membership about health and safety problems.

--Contact local newspapers or college newspapers to do investigative stories on health hazards. Get to know reporters who are interested in health & safety.

****Employee health and safety problems at the University of Berkeley California, Berkeley, campus were investigated and reported on in the local campus paper, in cooperation with AFSCME Local 1695 (American Federation of State, County and Municipal Employees).**

****A union whose members are exposed to asbestos got front-page coverage in their local newspaper when the union told reporters that the company had allegedly withheld information on job-related deaths and disease from asbestos exposure.**

--An increasing number of t.v., radio, magazine, and newspaper reporters are becoming interested in health and safety issues. Contact reporters if you are having trouble getting action on a health and safety problem at your workplace.

****T.V. - try to contact t.v. reporters when you have "news" stories that have a time element to them, or else when you want them to do a "feature". Find out if your local news station shows videotape programs; if they do, consider taping a show on health and safety. Find out if there are t.v. "speak-out" spots available.**

CBS and NBC have both had television shows that covered job health hazards. The CBS shows include **KEPONE**, **THE WIDOWS OF BUILDING 6**, and **THE POLITICS OF CANCER**, the latter aired June 22, 1976. An NBC dramatic (as opposed to documentary) show on workers developing cancer after exposure to a cancer-causing chemical is called **AIRFUL OF DEATH**. The CBS shows are available to rent. (See p. E-34).

****Radio --** Contact your local public interest or listener-sponsored radio show to see if a talk show on health and safety can be arranged. KPFA in Berkeley, California, has a regular radio broadcast called "Labor Pains" on which local union officials and workers have been guests. "All Things Considered" on National Public Radio has often considered job and consumer health hazards.

--Try to get nationwide coverage for health and safety problems, in situations where publicity can pressure companies to meet workers' demands for better working conditions.

****The Oil, Chemical and Atomic Workers** struck Shell Oil several years ago over health and safety demands; they got nationwide publicity for their strike and also received local coverage in communities where Shell refineries were located.

****The United Farm Workers** got nationwide publicity in their campaign to ban the short-handled hoe.

****Workers** who were poisoned by exposure to the pesticide KEPONE have testified at hearings and appeared on a nationwide CBS-TV show that was part of "60 Minutes."

--Let your elected representatives and Congresspersons know your concerns. Testify at hearings. Write letters. When you testify, send copies of your testimony to the press. Let reporters know when and where the hearings are being held.

****A representative of the Cannery Workers' Committee** (a rank and file group of cannery workers), unorganized electronics workers, and a meatwrapper all testified at a California State Assembly hearing on problems of working women.

*****Women from UNION WAGE** in California won the right to have night hearings before the Industrial Welfare Commission. They had been waging a campaign for several years to have committees and agencies hold hearings related to labor issues during hours when workers were free to testify.

KEEP FIGHTING JOB HAZARDS, TO PROTECT YOUR OWN HEALTH -- AND THE HEALTH OF YOUR
CO-WORKERS, YOUR WORKING PARENTS, HUSBANDS AND CHILDREN *

JOB

SAMPLE QUESTIONNAIRE # 1

URBAN PLANNING AID

HEALTH & SAFETY QUESTIONNAIRES

THE SAMPLE QUESTIONNAIRES ON THE FOLLOWING PAGES CAN BE USED TO SURVEY THE HAZARDS IN YOUR WORKPLACE AND TO OBTAIN INFORMATION ABOUT YOUR HEALTH EXPERIENCE AND THAT OF YOUR CO-WORKERS

FORM # 1: PRODUCED BY URBAN PLANNING AID, THIS FORM IS GEARED TO IDENTIFY THE MOST SERIOUS AND WIDESPREAD HAZARDS IN THE WORKPLACE.

FORM # 2: PRODUCED BY THE TEXTILE WORKERS UNION OF AMERICA, THIS FORM IS DESIGNED TO BE COMPLETED BY UNION REPRESENTATIVES OR INDIVIDUAL WORKERS. IT FOCUSES ON CHEMICAL HAZARDS IN THE WORKPLACE.

FORM #3: DEVELOPED BY OCAW, THIS FORM INCLUDES A COVER LETTER THAT EXPLAINS HOW TO CONDUCT THE SURVEY

FORM # 4: ENCOURAGE YOUR INTERNATIONAL OR NATIONAL UNIONS TO ADAPT THIS FORM FOR USE BY YOUR UNION. IT WAS DESIGNED TO STUDY THE PREGNANCY EXPERIENCE OF OPERATING ROOM PERSONNEL. LOCAL UNIONS CAN FILL OUT A MODIFIED FORMS, SEND THEM TO THE INTERNATIONAL, AND THE INTERNATIONAL UNION CAN OBTAIN INFORMATION FROM NIOSH ABOUT HOW THE FORMS CAN BE UTILIZED IN LEARNING WHETHER OR NOT THERE IS AN UNUSUAL INCIDENCE OF MISCARRIAGES, STILLBIRTHS, ETC.

NOTE: BOTH MALE AND FEMALE WORKERS SHOULD FILL OUT THE PREGNANCY FORMS. WIVES OF MALE WORKERS SHOULD ANSWER THE QUESTIONS ABOUT PREGNANCY EXPERIENCE.

1. Name
Address
Telephone
2. Place of work
Department
Job title and duties
Union local

ACCIDENTS

3. About how many work accidents happened in your company in the last year?
4. What were the causes?
Heavy lifting____ Dangerous chemicals____
Bad floors____ Lack of training____
Defective machinery____ Other causes
5. What types of injuries occurred?
Cuts____ Breaks or strains____
Burns____ Other injuries
6. Have there been any fires or explosions in the last year?
What was the cause?

ILLNESS

7. Were you given a pre-employment physical?
8. Does the company give periodic exams or medical tests?
Blood test____ Hearing test____
Urine test____ Other tests____
Chest X-ray____
Are you given all your test results?
9. Do people ever complain about:
Skin rashes____ Dizziness____
Infections____ Unusual tiredness____
Eye irritation____ Sore throat or chest____
Headaches____ Frequent colds____
Backaches____ Ringing ears____
Nausea____ Other problems
- Have any women you work with had miscarriages?
- Other child birth related problems?

DANGEROUS MATERIALS

10. Do you use any of the following dust-producing materials:

Asbestos_____	Pesticides, fungicides_____
Fiberglass_____	Pure cotton_____
Silica_____	Powdered food additives_____
Talc_____	Powdered dyes_____
Caustics_____	Other dusty materials_____

11. Do you use any of the following metals:

Lead_____	Chromium_____
Mercury_____	Cadmium_____
Beryllium_____	Other metals_____
Arsenic_____	

What is the process:

Grinding_____	Welding_____
Casting_____	Fabrication_____
Cutting_____	Other_____

12. Are solvents used in your workplace?

Carbon tetrachloride_____	Xylene_____
Benzene_____	Others_____
Methyl ethyl ketone (MEK)_____	(Brand names, if that's how you know them)
Toluene_____	

Can you smell any solvent?

All the time?

13. Are any of the following materials present:

Chlorine_____	Carbon monoxide_____
Ammonia_____	Coal tar or pitch_____
Formaldehyde_____	Hydrogen sulfide_____
Acids (specify)_____	Anesthetics (specify)_____
Aniline dyes_____	Polyvinyl chloride (PVC)_____
Cyanide_____	Other plastics_____
Fluorides_____	Other materials you worry about_____

PROCESSES AND ENVIRONMENT

- | | |
|--|-----------------------|
| 14. Which areas are very hot? | Why? |
| 15. Which areas are very cold? | Why? |
| 16. Which areas are very noisy? | Why? |
| 17. Are you asked to wear earplugs or muffs? | Are they comfortable? |
| 18. Which areas are poorly lit? | |

Which areas have too much glare?

19. Which areas have foul smells? What chemicals are at fault?
20. Is there a lot of dust? In what areas?
Are you asked to wear respirator masks? Are they any good?
Is ventilation adequate?
Is dust swept or vacuumed regularly?
21. Do you work with any radioactive materials? (specify)
Microwave ovens?
22. Are there eye wash stations? A first aid office or rest area?
23. Does the company provide work clothes? Do they clean them?
24. Are there clean, adequate toilet facilities?
A clean lunchroom?
25. What protective gear is used?
Does the company pay for it?
26. Does the company have monitoring equipment installed?
What is being monitored?
27. Are there any problems with shift rotation?
28. Is there frequent speed-up?
29. Is general housekeeping good?
30. Are there enough exits to clear the building in an emergency?
Are all exits clear and well-marked?
31. Is there a lot of stress in your work?

GENERAL QUESTIONS

32. Were you adequately trained for your job?
33. Are warning signs, notices, etc. printed in the languages everyone speaks?
34. Is there a safety committee representing the workers?
How is it chosen?
35. Are you aware of any state or federal inspections having taken place?
When?
Did they bring any results?
36. Is there a safety clause in your union contract?

SUMMARY

37. What are the health and safety problems you think are most serious? What would you like to see done about them?



TEXTILE WORKERS UNION OF AMERICA
Research Department
New York, New York

OCCUPATIONAL HEALTH HAZARD QUESTIONNAIRE

1. Are there any conditions in your plant which have caused or may cause physical harm to any worker? _____
2. Plant identification:
Company _____
Location _____
Products _____
3. Describe the condition (or conditions) which you believe may be harmful. (Be specific; identify department and operations) _____

4. If potential harm may be due to any substances to which workers are exposed, give as much of the following information as you can about such substance(s):
 - a. Trade name(s) _____

 - b. Chemical name(s) _____

 - c. Manufacturer(s) _____

 - d. Precautionary label(s), if any; copy exactly what label(s) says _____

 - e. Check the type(s) of exposure:
____ Breathing; ____ Contact; ____ Swallowing; ____ Other - specify _____
 - f. Check the form of hazardous substance(s): ____ Dust; ____ Mist; ____ Gas;
____ Fumes; ____ Other - specify _____
 - g. How many hours per day is worker exposed to substance(s) described above? _____
 - h. What adverse effects has exposure had on worker(s)? _____

-2-

5. If the health of any worker(s) has been adversely affected as a result of hazardous conditions in the plant, give as much of the following information as you can:

a. Name(s) of worker(s) _____

b. Has physician been consulted? _____

c. Physician's diagnosis _____

d. Approximate date of occurrence _____

6. What steps have you or the union taken to correct this condition? (Indicate dates and company response) _____

7. Provide any additional particulars concerning the nature of health hazards at the plant _____

8. Who is the union representative at the plant who should be contacted in connection with any government inspection?

a. Name _____

b. Address _____

c. Union position _____

d. Job title _____

e. Dept. and shift _____

9. This report completed by:

a. Name (signed) _____

b. Union position _____

c. Address _____

d. Telephone (including area code) _____

e. Date _____

10. If you wish your name to be withheld from any copy of this report which may be furnished to the employer check here _____

SEND COMPLETED QUESTIONNAIRE TO:

TWUA RESEARCH DEPT., 99 UNIVERSITY PLACE, NEW YORK, N.Y. 10003

SAMPLE QUESTIONNAIRE # 3
OIL, CHEMICAL, AND ATOMIC WORKERS
INTERNATIONAL UNION

SURVEYING THE WORKPLACE

In order to be an effective health and safety officer in your Local you must be able to recognize and evaluate the hazards of the workplace. A systematic survey is the most effective way of doing this. The survey should be carried out department by department, work area by work area by inspecting the site and interviewing the workers in the various areas.

In order to facilitate this survey, OCAW is providing a form which can be filled out by the health and safety officer. The attached form relates to health hazards on the job. A survey form for safety hazards is presently being developed and will be made available shortly.

HOW TO USE THE SURVEY FORM

1. The workplace should be divided into logical areas where similar types of processes occur. If an area has more than one process, then several forms should be filled out for each individual process.
2. Processes should be identified by their commonly used name. It is important to know whether the work is carried out in the open or in sealed pipes or vats.
3. In order to assess the possible chemical hazards, all chemicals used or produced must be identified. In this section you may run into the problem of trade names. If you only know a chemical by a trade name or a code number, indicate it as such on the form. After the survey is completed you can then go through the necessary channels in order to identify the substance(s).
4. Whether or not the process is open or closed, there may still be fumes, dust, mists or gases. If you can, identify which of these forms of pollutant is present and what they are.
5. Ventilation can either be natural (open windows or doors) or fans, ducts, or blowers. You may not have any ventilation at all. If you or others working in the area do not feel that the ventilation is adequate, this is probably as good an examination of the ventilation as any engineer can make.

Many times an adequately designed system has so many hoods or ducts added to it that it can no longer perform properly. Good ventilation means that the worker does not smell the chemicals he or she works with or is not irritated by them. The ventilation system when installed had a specific capacity. Insist on finding out what this designed capacity was and then insist on air measurement to see how the air flow rate compares with the designed capacity.

SURVEYING THE WORKPLACE

Page 2

6. The items listed represent the various kinds of physical hazards that may be present. All of them have serious consequences, but be particularly careful to know all radiation sources. They should be marked with the Atomic Energy seal. Radiation sources are often used in Quality Control to monitor the thickness of films and the flow rate in pipes. They must all be treated with respect.

7. In order to assess the hazardous potential of the environment, air samples must be taken to find the concentration of the various solids. By law, all areas with asbestos exposure require that at least one such measurement shall have been taken. If no air samples were taken in the past, write this down. If the results were not made available, make a formal request for them. Fill out the OCAW Asbestos Questionnaire.

8. One of the problems of occupational health is that very few concrete facts are known about the effects of long-range exposure to various industrial hazards. The way studies are carried out is by examining workers who have been exposed to these hazards. In an approximate way you can do this as well. For instance, if any worker complains of rashes, nose bleeds or has frequent kidney infections, then this can mean that there is some substance or condition in the workplace causing the problem. Many substances have particular tests which indicate exposure. For instance, most metals like mercury, lead, cadmium, copper, etc., can be found in the urine and blood. Many solvents and other chemicals also show up in the body in various forms. You will be receiving shortly a Table of Common Chemicals and the appropriate exposure tests. Determine now whether this has ever been done in the past and whether anyone was ever apprised of the actual results. In addition, it is good practice to have regular medical examinations and it is especially important when people are forced to work in hazardous conditions.

Once again, did the workers ever receive the results of these examinations? In the future we will coordinate with the locals so that all the medical exam results can be sent to one particular physician so that we can correlate the results of the group as a whole and determine if any trends of illness develop.

9. Even before the passage of the Health and Safety Act and the recently negotiated Health and Safety Contract Language, OCAW members have been aware of various hazards in the workplaces. Using their right to bargain over the working conditions, have the stewards filed a grievance in the past? Make sure that the subject of these grievances have been covered somewhere in this survey form. If not, please add it as comment at the end of the survey form.

10. Similarly, have any accidents occurred in this area? What were they and what was done about them?

11. If there was a noise survey of the plant, indicate the level found and the day that the test was taken. Many substances can be monitored by permanently installed devices. Are there any such devices in the area? If so, when was the monitoring equipment last calibrated and what level is the alarm set at.

SURVEYING THE WORKPLACE
Page 3

Once this survey form has been completed, you should be able to pinpoint many of the problem areas. For instance, if you are working with chemicals known only to you by a trade name, then this should be an immediate topic of discussion at your next joint Health and Safety Committee Meeting.

If the survey has found there to be inadequate ventilation, lack of proper monitoring, exposure to physical hazards and a neglect to administer the appropriate medical examination, then this too should be discussed at the meeting.

To systematically survey the workplace you should develop an agenda for fruitful and meaningful health and safety needs. This survey should be repeated monthly (it can be done by the area stewards with proper instructions). The survey form should be kept in the local so that a record of the kinds of exposure and any possible harmful results will be available.

When the safety survey form is completed and sent to you, it too, should be treated in the same manner as this Occupational Health Survey Form.

OIL, CHEMICAL AND ATOMIC WORKERS INTERNATIONAL UNION

OCCUPATIONAL HEALTH PLANT INITIAL SURVEY FORM

(Fill in appropriate spaces -- use reverse side for comments or additional space)

Date _____

1. AREA:

2. PROCESS:

Is this an open or closed process? _____

3. CHEMICALS USED OR PRODUCED:

4. IS THERE EXPOSURE TO: (identify them if you can)

Fumes _____
Dusts _____
Mists _____
Gases _____

Is there skin contact with any chemicals? _____

Which ones? _____

5. VENTILATION:

Is there any ventilation? _____

Do you think it is adequate? _____

Is the system performing up to design capacity? _____

Air flow rate _____

OCCUPATIONAL HEALTH PLANT INITIAL SURVEY FORM

Page 2

6. PHYSICAL HAZARDS:

Are any of the following physical hazards present:

Noise _____	Vibrations _____
Temperature extremes: Hot _____	Cold _____
Poor lighting _____	Radiation sources _____
Ultraviolet, infrared or microwave radiation _____	

7. MONITORING:

Are air samples taken? _____ Results _____

8. MEDICAL:

Are there common medical complaints? (rashes, cough, burning eyes) _____

Do you know what the cause is? _____

Are there regularly administered:	Urinalyses _____
	Blood tests _____
	General Medical Exams _____

Do the workers or their physicians receive the results? _____

9. HAVE HEALTH & SAFETY GRIEVANCES BEEN FILED IN THE AREA? _____

Explain: _____

10. HAVE ANY ACCIDENTS OCCURRED IN THIS AREA? _____

11. FILL IN ONLY IF APPLICABLE:

Noise level _____ Date measured _____

Are there permanent monitoring devices for toxics? _____

Calibrated (date)	_____
Level alarm set at	_____

Comments: _____

SAMPLE QUESTIONNAIRE # 4 - PREGNANCY EXPERIENCE

ASA AD HOC COMMITTEE

Anesthesiology
V 41, No 4, Oct 1974

EFFECTS OF WASTE ANESTHETICS ON HEALTH

File Number

(17)

Form Approved
OMB No 68 R1331

INSTRUCTIONS: This form should take only 5 to 10 minutes to fill out. Print numbers clearly in the appropriate boxes. Most answers require only a check. Please fill out both sides of the page.

Soc. Sec. No. (8-16) Birthdate: Mo. Year (17-20) Sex: M F (21)

WORKING ENVIRONMENT: Check area of your primary assignment (only one check for each year)

Year	OR	ICU	OB	Dental	Other hospital duties	Not working in hospital	
1963	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(22)
1964	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(23)
1965	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(24)
1966	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(25)
1967	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(26)
1968	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(27)
1969	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(28)
1970	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(29)
1971	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(30)
1972	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(31)

If you have not worked in the OR during the past 5 years, disregard the next four questions:

Are your operating rooms air-conditioned? Yes ☐ No ☐ Don't Know ☐ (32)
 Is this a recirculating ventilating system? Yes ☐ No ☐ Don't Know ☐ (33)
 Are overflow anesthetic gases currently exhausted from the OR? Yes ☐ No ☐ Don't Know ☐ (34)
 If yes, when was this system completed? Month Year (35-38) Don't Know ☐ (39)

QUESTIONS CONCERNING YOUR OWN HEALTH:

Have you ever had cancer or leukemia? Yes ☐ No ☐ (40)
 If yes, year of onset (41-42)
 Diagnosis: site _____ type _____

Have you had other health problems during the past 10 years?

Liver? Yes ☐ No ☐ (43) Diagnosis _____
 Kidney? Yes ☐ No ☐ (44) Diagnosis _____
 Other? Yes ☐ No ☐ (45) Diagnosis _____

QUESTIONS CONCERNING YOUR PREGNANCY HISTORY

(For males, this section applies to your wife)

Have you been studied for infertility? Yes ☐ No ☐ (46)
 If yes, what was the diagnosis? _____
 Was an abnormality found? Yes ☐ No ☐ (47)
 Total number of pregnancies (48-49)
 Total number of pregnancies and miscarriages in the past ten years (50-51)

Additional comments after completing questionnaire _____

FIG. 1A. Questionnaire form.

O.R. OCCUPATIONAL DISEASE

PREGNANCY HISTORY DURING PAST 10 YEARS (For males, the following questions pertain to your spouse(s)). Use a separate line for each pregnancy (including miscarriages). In the event of multiple births, list each child individually

No.	AGE of Mother (18-9)	Date of Birth or Abortion		Week of gestation (14-16)	Weight oz.		Sex		Stillborn		Abortion		Check if either parent was working in the O.R. during pregnancy						CONTRACEPTION within 12 months prior to pregnancy	
		Month (11-10)	Year (12-13)		lb	oz	M	F	Yes	No	Spont	Therap	1st Mother	2nd Father	3rd Mother	4th Father	None	Pill	Other	
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				

No.	PREGNANCY HISTORY		Abdominal X-ray		Congenital Abnormalities		HEALTH OF CHILDREN BORN DURING PAST 10 YEARS		Cancer or Leukemia		Diagnosis		Death of Child	
	Smoking during pregnancy (cigarettes/day)	Rubella during pregnancy	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1														
2														
3														
4														
5														
6														
7														
8														

(142-43) (144-45) (146-47)
 (148) (149) (150-51)
 (152) (153)

*Table of Congenital Abnormalities:
 A. cardiovascular 1. atrial septal defect 2. ventricular septal defect 3. patent ductus 4. other
 B. respiratory 1. choanal atresia 2. diaphragmatic hernia 3. agenesis of lung 4. other
 C. musculoskeletal 1. achondroplasia 2. syndactyly 3. limb amputation 4. other
 D. craniofacial 1. cleft lip 2. cleft palate 3. epidermolysis bullosa 4. other
 E. central nervous system 1. epilepsy 2. hydrocephalus 3. hypoplasia 4. other
 F. urogenital 1. atrophy of bladder 2. hypospadias 3. undescended testis 4. other
 G. skin 1. cavernous hemangioma 2. birthmark 3. nevus 4. other

FIG. 1B. Questionnaire form, reverse side.

California-

Berkeley: Labor Occupational Health Program
 Institute of Industrial Relations
 Center for Labor Research and Education
 University of California
 2521 Channing Way
 Berkeley, California 94720
 (415) 642-5507

UNIVERSITY, PUBLIC INTEREST,
 AND "COSH" GROUPS THAT CAN
 ASSIST WORKERS AND UNIONS
 ON HEALTH AND SAFETY PROBLEMS

Los Angeles:

Labor Environment Institute
 3084 Manning
 Los Angeles, California 90064
 (213) 839-0451 (ask for Jim Dahlgren)
 (213) 397-8375 (ask for Steve Newman)

Oakland: Bay Area Committee for Occupational Safety and Health
 (BACOSH)
 P.O. Box 24774
 Oakland, California 94623

San Diego:

San Diego Committee for Occupational Safety and Health
 (SD/COSH)
 P.O. Box 99011
 San Diego, California 92109
 (714) 459-2160 (ask for Ruth Heifetz)

San Francisco:

Occupational Health Project
 Medical Committee for Human Rights
 558 Capp St.
 San Francisco, California 94110
 (415) 824-5888 (ask for K. D. Drury)

Washington, D.C.-

Health Research Group
 2000 P Street NW, Suite 708
 Washington, D.C. 20036
 (202) 872-0320

PROD ("Professional Drivers' Organization")
 P.O. Box 69
 Washington, D.C. 20044
 (202) 833-9700

Illinois-

Chicago: Chicago Area Committee for Occupational Safety and Health
 (CACOSH)
 542 So. Dearborn Street, Rm. 508
 Chicago, Illinois 60605
 (312) 939-2104

Massachusetts--

Cambridge:

Industrial Health and Safety Project
 Urban Planning Aid
 639 Massachusetts Avenue
 Cambridge, MA. 02139
 (617) 661-9220

New York--

New York City:

Labor Safety and Health Institute
 381 Park Avenue, S.
 New York, New York 10016
 (212) 689-8959 (Ask for Frank Goldsmith)

Health/PAC
 17 Murray Street
 New York, New York 10017
 (212) 267-8890

North Carolina--

Durham: North Carolina Public Interest Research Group
 PO Box 2901
 Durham, N.C. 27705
 (919) 286-2275

Ohio--

Columbus: Ohio State University's Labor Education and Research Service
 1810 College Road
 Columbus, Ohio 43210
 (614) 422-8157

Pennsylvania--

Pittsburgh: Pittsburgh Area Committee for Occupational Safety and Health (PACOSH)
 PO Box 7566
 Pittsburgh, PA. 15213

Philadelphia: PHILAPOSH
 c/o Rick Engler
 414 W. Stafford Street
 Philadelphia, Pa. 19144

South Carolina--

Cayce: The Southern Institute for Occupational Health (SIOH)
 PO Box 861
 Cayce, S.C. 29033

Wisconsin--

Madison: School for Workers
 University of Wisconsin Extension Program
 432 No. Lake Street
 Madison, Wisconsin 53706

USEFUL PUBLICATIONS

7-34

AND FILMS

PUBLICATIONS:

Several health and safety organizations or unions publish helpful newsletters and pamphlets about health and safety. The following should prove particularly useful:

MONITOR Published 10 times a year by the Labor Occupational Health Program, U.C. Berkeley, 2521 Channing Way, Berkeley, CA. 94720
\$3.00 individuals; \$10.00 organizations.

OCAW LIFELINES - OCAW HEALTH AND SAFETY NEWS
Oil, Chemical and Atomic Workers Union
1636 Champa Street, Denver, CO. 80202 \$2.00/year. Monthly.

IUD FACTS AND ANALYSIS

Sheldon Samuels, Industrial Union Department, AFL-CIO
815 16th Street, N.W. Washington, D.C. 20006

JOB HEALTH NEWS SERVICE

bi-weekly, \$25.00/year. 910 17th Street, N.W. Washington, D.C. 20006

SURVIVAL KIT - Urban Planning Aid, 639 Massachusetts Avenue
Cambridge, MA. 02139.

HAZARD - Society for Occupational and Environmental Health,
P.O. Box 28303 Central Station, Washington, D.C. 20005

OTHER: A number of labor unions have newspapers which regularly include articles on health and safety. Two examples are the United Mine Workers Journal (2457 E. Washington, Indianapolis, Ind.)
UAW Washington Report (UAW, 8000 E. Jefferson Avenue, Detroit, Mi. 48214 (Editor, Frank Wallick)

FILMS:

WORKING STEEL	20 minutes, black and white. Health and safety film on foundry hazards. Available to rent or buy from LOHP, address on cover. Produced in 1976 by Labor Occupational Health Program.
TYLER, TEXAS	30 minutes, black and white. Purchase from KERA, Channel 13, Dallas, Texas (3000 Harry Hine Blvd) 75201 \$85.00 Health and safety film on asbestos. Interviews workers.
KEPONE	CBS production as part of "60 Minutes". Available to rent or buy from CBS. CBS-TV 35 W. 45th Street, New York, New York. Tragic poisoning of workers, water system, environment by pesticide.
THE POLITICS OF CANCER	Available from CBS to buy or rent. Shown on June 22, 1976. Sections of it deal with occupational cancer. Other parts deal with environmental causes of cancer.
THE WIDOWS OF BUILDING 6	About the Coalition of Widows formed in Philadelphia after their husbands died from exposure to the cancer-causing substance BCME at the Rohm and Haas Company. CBS-TV.
I NEVER HAD AN ACCIDENT IN MY	Produced by Local 342 of the Amalgamated Meatcutters and Retail Food Store Employees Union of Greater New York Info on rental: Local 342, 186-18 Hillside Ave, Jamaica, NY 11432

-- APPENDICES --

APPENDIX A

22 States with Occupational Safety and Health Plans approved by OSHA as of May 15, 1976*:

ALASKA	NEVADA
ARIZONA	NEW MEXICO
CALIFORNIA	NORTH CAROLINA
COLORADO	OREGON
CONNECTICUT	SOUTH CAROLINA
HAWAII	TENNESSEE
INDIANA	UTAH
IOWA	VERMONT
KENTUCKY	VIRGIN ISLANDS
MARYLAND	WASHINGTON
MICHIGAN	WYOMING
MINNESOTA	

*Formal rejection proceedings are in process against the state of Virginia.

APPENDIX B -1

U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION		Form Approved OMB No. 044R1449									
<h2 style="margin: 0;">COMPLAINT</h2>		<table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <tr> <th colspan="3" style="text-align: center;">For Official Use Only</th> </tr> <tr> <td style="width: 33%;">Area</td> <td style="width: 33%;">Date Received</td> <td style="width: 33%;">Time</td> </tr> <tr> <td>Region</td> <td colspan="2">Received By</td> </tr> </table>	For Official Use Only			Area	Date Received	Time	Region	Received By	
For Official Use Only											
Area	Date Received	Time									
Region	Received By										
<p>This form is provided for the assistance of any complainant and is not intended to constitute the exclusive means by which a complaint may be registered with the U.S. Department of Labor.</p>											
<p>The undersigned (<i>check one</i>)</p> <p> <input type="checkbox"/> Employee <input type="checkbox"/> Representative of employees <input type="checkbox"/> Other (<i>specify</i>) _____ </p> <p>believes that a violation at the following place of employment of an occupational safety or health standard exists which is a job safety or health hazard.</p> <p>Does this hazard(s) immediately threaten death or serious physical harm? <input type="checkbox"/> Yes <input type="checkbox"/> No </p>											
<p>Employer's Name _____</p> <p> Address (Street _____ Telephone _____ (_____ (City _____ State _____ Zip Code _____ </p>											
<p>1. Kind of business _____</p> <p>2. Specify the particular building or worksite where the alleged violation is located, including address. _____</p> <p>3. Specify the name and phone number of employer's agent(s) in charge. _____</p> <p>4. Describe briefly the hazard which exists there including the approximate number of employees exposed to or threatened by such hazard. _____</p>											
<i>(Continue on reverse side if necessary)</i>											
<p>Sec. 8(f)(1) of the Williams-Steiger Occupational Safety and Health Act, 29 U.S.C. 651, provides as follows: Any employees or representative of employees who believe that a violation of a safety or health standard exists that threatens physical harm, or that an imminent danger exists, may request an inspection by giving notice to the Secretary or his authorized representative of such violation or danger. Any such notice shall be reduced to writing, shall set forth with reasonable particularity the grounds for the notice, and shall be signed by the employees or representative of employees, and a copy shall be provided the employer or his agent no later than at the time of inspection, except that, upon request of the person giving such notice, his name and the names of individual employees referred to therein shall not appear in such copy or on any record published, released, or made available pursuant to subsection (g) of this section. If upon receipt of such notification the Secretary determines there are reasonable grounds to believe that such violation or danger exists, he shall make a special inspection in accordance with the provisions of this section as soon as practicable, to determine if such violation or danger exists. If the Secretary determines there are no reasonable grounds to believe that a violation or danger exists he shall notify the employees or representative of the employees in writing of such determination.</p>											

(Continued on reverse side)

5. List by number and/or name the particular standard (or standards) issued by the Department of Labor which you claim has been violated, if known.

6. (a) To your knowledge has this violation been considered previously by any Government agency? _____

(b) If so, please state the name of the agency _____

(c) and, the approximate date it was so considered. _____

7. (a) Is this complaint, or a complaint alleging a similar violation, being filed with any other Government agency? _____

(b) If so, give the name and address of each. _____

8. (a) To your knowledge, has this violation been the subject of any union/management grievance or have you (or anyone you know) otherwise called it to the attention of, or discussed it with, the employer or any representative thereof? _____

(b) If so, please give the results thereof, including any efforts by management to correct the violation. _____

9. Please indicate your desire:

☐ I do not want my name revealed to the employer.

☐ My name may be revealed to the employer.

Continue Item 4 here, if additional space is needed.

Signature _____ Date _____

Typed or Printed Name _____

If you are a representative of employees,
state the name of your organization _____

Address (Street _____ Telephone _____
(_____
(City _____ State _____ Zip Code _____

APPENDIX B-2

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

REQUEST FOR HEALTH HAZARD EVALUATION

This form is provided to assist in registering a request for a health hazard evaluation with the U.S. Department of Health, Education, and Welfare as provided in Section 20(a)(6) of the Occupational Safety and Health Act of 1970 and 42 CFR Part 85. (See Statement of Authority on Reverse Side).

Name of Establishment Where Alleged Hazard(s) Exist _____

Company { Street _____ Telephone _____
Address { City _____ State _____ Zip Code _____

1. Principal Company Activity _____
(manufacturing, construction, transportation, services, etc.)

2. Specify the particular building or worksite where the alleged hazard is located, including address _____

3. Specify the name and phone number of employer's agent(s) in charge. _____

4. Describe briefly the hazard(s) which exists by completing the following information:

Identification of Hazard or Toxic Substance(s) _____

Trade Name (If Applicable) _____ Chemical Name _____

Manufacturer _____ Does the material have a warning label? _____ Yes _____ No

If Yes, attach copy of label or a copy of the information contained on the label.

Physical Form: Dust ☐ Gas ☐ Liquid ☐ Mist ☐ Other ☐

Type of Exposure? Breathing ☐ Swallowing ☐ Skin Contact ☐

Number of People Exposed _____ Length of Exposure (Hours/Day) _____

Occupations of Exposed Employees _____

5. Using the space below describe further the nature of the conditions or circumstances which prompted this request and other relevant aspects which you may consider important, such as the nature of the illness or symptoms of exposure, the concern for the potentially toxic effects of a new chemical substance introduced into the workplace, etc.

6. (a) To your knowledge has this hazard been considered previously by any Government agency? _____

(b) If so, give the name and address of each.

(c) and, the approximate date it was so considered. _____

7. (a) Is this request, or a request alleging a similar hazard, being filed with any other Government agency? _____ (b) If so, give the name and address of each.

The undersigned (check one)

☐ Employer

☐ Authorized Representative of employees*

i ii iii (circle one)

believes that a substance (or substances) normally found at the following place of employment may have potentially toxic effects in the concentration used or found.

Signature _____ Date _____

Typed or Printed Name _____ Telephone: Home - _____

Address { Street _____ Business - _____
City _____ State _____ Zip Code _____

If you are a representative of employees, state the name and address of your organization.

Please indicate your desire:

☐ I do not want my name revealed to the employer.

☐ My name may be revealed to the employer.

Authority:

Section 20(a)(6) of the Occupational Safety and Health Act, (29 U. S. C. 669(a)(6)) provides as follows: The Secretary of Health, Education, and Welfare shall . . .determine following a written request by any employer or authorized representative of employees, specifying with reasonable particularity the grounds on which the request is made, whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found; and shall submit such determination both to employers and affected employees as soon as possible. If the Secretary of Health, Education, and Welfare determines that any substance is potentially toxic at the concentrations in which it is used or found in a place of employment, and such substance is not covered by an occupational safety or health standard promulgated under section 6, the Secretary of Health, Education, and Welfare shall immediately submit such determination to the Secretary of Labor, together with all pertinent criteria.

"Authorized representative of employees" means any person or organization meeting the conditions specified in 42 CFR Part 85.3 (b) (4) (i), (ii) or (iii):

(i) - that he is an authorized representative of, or an officer of the organization representing, the employees for purposes of collective bargaining; or

(ii) - that he is an employee of the employer and is authorized by two or more employees employed in the workplace where the substance is normally found, to represent them for purposes of the Act. Each such authorization shall be in writing and included in the request; or

(iii) - that he is one of three or less employees employed in the workplace where the substance is normally found.

Send the completed form to:

National Institute for Occupational Safety and Health
Hazard Evaluation Services Branch
U.S. Department of Health, Education, and Welfare
Cincinnati, Ohio 45202

APPENDIX C

UNITED STATES DEPARTMENT OF LABOR REGIONAL OFFICES

REGION 1—Boston
Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

REGION 2—New York
New Jersey
New York
Puerto Rico
Virgin Islands

REGION 3—Philadelphia
Delaware
District of Columbia
Maryland
Pennsylvania
Virginia
West Virginia

REGION 4—Atlanta
Alabama
Florida
Georgia
Kentucky
Mississippi
North Carolina
South Carolina
Tennessee

REGION 5—Chicago
Illinois
Indiana
Michigan
Minnesota
Ohio
Wisconsin

REGION 6—Dallas
Arkansas
Louisiana
Oklahoma
Texas
New Mexico

REGION 7—Kansas City
Iowa
Kansas
Missouri
Nebraska

REGION 8—Denver
Colorado
Montana
North Dakota
South Dakota
Utah
Wyoming

REGION 9—San Francisco
Arizona
California
Hawaii
Nevada

REGION 10—Seattle
Alaska
Idaho
Oregon
Washington

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGIONAL OFFICES

REGION 1—Boston
Donald A. Mackenzie
John F. Kennedy Federal Bldg.
Government Center 308E
Boston, Massachusetts 02203
617-223-6712

REGION 2—New York
Alfred Barden
* 1515 Broadway
Room 3445
New York, New York 10036
212-971-5754

REGION 3—Philadelphia
David H. Rhone
Penn Square Building
Room 623
1317 Filbert Street
Philadelphia, Penna. 19107
215-597-1201

REGION 4—Atlanta
Basil Needham
Suite 587, 1375 Peachtree St., NE.
Atlanta, Georgia 30309
404-526-3573

REGION 5—Chicago
Edward E. Estkowski
300 South Wacker Drive
Room 1201
Chicago, Illinois 60606
312-353-4716

REGION 6—Dallas
John Barto
Suite 600, Texaco Building
1512 Commerce Street
Dallas, Texas 75201
214-749-2477

REGION 7—Kansas City
Joseph Reidinger
823 Walnut Street
Room 300, Waltham Building
Kansas City, Missouri 64106
816-374-5249

REGION 8—Denver
Howard J. Schulte
Federal Bldg., Rm. 15010, P.O. Box 3588
1961 Stout Street
Denver, Colorado 80202
303-837-3883

REGION 9—San Francisco
Gabriel J. Gillotti
9470 Federal Building
450 Golden Gate Avenue
Box 36017
San Francisco, California 94102
415-556-0584

REGION 10—Seattle
James W. Lake
1808 Smith Tower Bldg.
506 Second Avenue
Seattle, Washington 98104
206-442-5930

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY & HEALTH

TO REQUEST A NIOSH HEALTH HAZARD EVALUATION OR TO OBTAIN CRITERIA DOCUMENTS, WRITE TO:

NIOSH
4676 COLUMBIA PARKWAY
CINCINNATI, OHIO 45226

CONFIDENTIAL

		For Office Use Only	
Complainant's Name _____ <div style="text-align: right;"><small>Type or Print</small></div>	A. Region _____ Rec'd By _____ Date _____		
Position _____	Telephone <input type="checkbox"/> Written <input type="checkbox"/> Oral-In Person <input type="checkbox"/>		
Address _____ <div style="text-align: center;"><small>Street</small></div>	B. District _____ Rec'd/Reg: Date _____ Time _____		
<div style="display: flex; justify-content: space-between;">City _____Zip Code _____</div>	C. District _____ Rec'd By _____ Date _____		
Telephone _____ <div style="display: flex; justify-content: space-around;">Area () HomeArea () Office</div>	Telephone <input type="checkbox"/> Written <input type="checkbox"/> Oral-In Person <input type="checkbox"/>		
	D. Complaint Log No. _____		

Complaint (Check one)

☐ Employee ☐ Representative of employees

If you are a representative of employees, state
the name of your organization: _____

☐ Other (specify) _____

I believe that a violation at the following place of employment of an occupational safety or health order exists which is a job safety or health hazard.

Does this hazard(s) immediately threaten death or serious physical harm? ☐ Yes ☐ No

Employer's Name _____

Address _____

Street

City _____Zip code _____

Telephone () _____

Area

1. Kind of business _____
2. Specify the particular building or worksite where the alleged violation is located, including address. _____
3. Specify the name and phone number of employer's agent(s) in charge. _____
4. Describe briefly the hazard which exists there including the approximate number of employees exposed to or threatened by such hazard.

5. List by number and/or name the particular order(s) or code(s) which you claim has been violated, if known.

6. (a) To your knowledge has this violation been considered previously by any Government agency? _____

(b) If so, please state the name of the agency _____

(c) and, the approximate date it was so considered. _____

7. (a) Is this complaint, or a complaint alleging a similar violation, being filed with any other Government agency? _____

(b) If so, give the name and address of each. _____

8. (a) To your knowledge, has this violation been the subject of any union/management grievance or have you (or anyone you know) otherwise called it to the attention of, or discussed it with, the employer or any representative thereof? _____

(b) If so, please give the results thereof, including any efforts by management to correct the violation. _____

9. Please indicate your desire:

☐ I do not want my name revealed to the employer.

☐ My name may be revealed to the employer.

Continue Item 4 here, if additional space is needed.

(Date)

(Signature of Complainant)

Complaint handled by: _____ Date _____

Engineer Signature

APPENDIX D- 2

OFFICES OF THE DIVISION OF INDUSTRIAL SAFETY

Main Offices

SAN FRANCISCO	455 Golden Gate Ave.	94102	415-557-1946
Los Angeles	3460 Wilshire Blvd.	90010	213-381-1332

Regional Offices

Fresno	2550 Mariposa St.	93721	209-488-5302
Los Angeles	3460 Wilshire Blvd.	90010	213-381-5695
Sacramento	714 P St.	95814	916-445-5818
San Diego	1350 Front St.	92101	714-236-7325
San Francisco	1540 Market St.	94102	415-557-1677

District Offices

Bakersfield	225 Chester Ave.	93301	805-324-6437
Chico	198 East 11th St.	95926	916-343-5182
Concord	1070 Concord Ave.	94520	415-676-5333
El Monte	3415 Fletcher Ave.	91731	213-572-6960
Long Beach	230 E. Fourth St.	90802	213-432-8443
Los Angeles	3460 Wilshire Blvd.	90010	213-381-3861
Modesto	1800 Coffee Rd.	95355	209-529-7751
Oakland	1111 Jackson St.	94607	415-464-0660
Panorama City	8155 Van Nuys Blvd.	91402	213-782-1800
Redding	1421 Court St.	96001	916-246-1621
Salinas	21 W. Laurel Dr.	93901	408-449-7235
San Bernardino	303 W. Third St.	92401	714-383-4321
San Jose	888 N. First St.	95112	408-277-1260
San Mateo	2555 Flores St.	94403	415-573-1718
Santa Ana	28 Civic Center Plaza	92701	714-558-4141
Santa Barbara	5276 Hollister Ave.	93111	805-964-3554
Santa Rosa	750 Mendocino Ave.	95401	707-542-8802
Stockton	31 E. Channel St.	95202	209-948-7762
Vernon	2833 Leonis Blvd.	90058	213-589-5848

Field Offices

Eureka	619 Second St.	95501	707-442-5748
Ukiah	264 E. Smith St.	95482	707-462-8850
Ventura	3418 Loma Vista Rd.	93003	805-642-1475

NOTE: The offices listed on this page will handle safety and health complaints.

APPENDIX D-3

DEPARTMENT OF HEALTH
Occupational Health Section

Dr. David Parkinson, Director

ADDRESS:

TELEPHONE:

Headquarters:

714 P Street - Room 440
Sacramento, California, 95814
(Albert C. Starr, Chief)

Public: 916-322-2097
ATSS: 8-492-2097

Field Offices:

Berkeley, California, 94704
2151 Berkeley Way

Public: 415-843-7900
extension 381
ATSS: 8-571-2381

Fresno, California, 93721
2550 Mariposa Street

Public: 209-488-5302
ATSS: 8-421-5302

Los Angeles, California, 90026
1449 Temple Street
(P. O. Box 30327
Terminal Annex, 90030)

Public: 213-620-4290
ATSS: 8-640-4290

San Diego, California, 92101
1309 State Street, 2nd floor

Public: 714-236-7325
ATSS: 8-631-7218

San Francisco, California, 94102
455 Golden Gate Avenue - Room 7220
(P. O. Box 603, 94101)

Public: 415-557-3426
ATSS: 8-597-3426

Standards Development Unit

William Steffan, Supervising I.H. Engineer
455 Golden Gate Avenue, Room 7220
(P. O. Box 603, 94101)
San Francisco, California, 94102

Medical Services Unit

Irma West, M. D., PHMO III
714 P Street
Sacramento, California, 95814

Northern California Field Studies Unit
and Northern California Pool

Jim Lim, Supervising I.H. Engineer
2151 Berkeley Way
Berkeley, California, 94704

Planning, Training, Evaluation Unit

R. McMillan, Supervising I.H. Engineer
714 P Street
Sacramento, California, 95814

Southern California Field Studies Unit,
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APPENDIX E

Excerpt from Testimony of Erica Black Grubb,
Attorney with Public Advocates, before the

Assembly Labor Relations Committee
on
"Occupational Health Issues for Women Workers,"
December 8, 1975, San Francisco, CA

Section 703(a) of Title VII provides that "It shall be an unlawful employment practice for an employer

(1) to fail or refuse to hire or to discharge any individual, or otherwise to discriminate against any individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's ... sex..." or

(2) to limit, segregate, or classify employees or applicants for employment in any way which would deprive or tend to deprive any individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's ...sex...." 42 U.S.C. Section 2000e-2(a)(1974).

Technically, therefore, any state OSHA regulations that apply a health standard solely to women--with the possible result of excluding women workers from entire lines of work--would violate Title VII. In fact, such state regulations would basically be a new version of the state "protective legislation"^{2/} that the courts have determined to be in conflict with Title VII. See, e.g., Bowe v. Colgate Pamolive Co., 416 F.2d 711 (7th Cir. 1969) (companies may not use stereotyped assumptions about women's capabilities, but rather must consider individual abilities); Rosenfeld v. Southern Pacific Co., 444 F.2d 1219 (9th Cir. 1971).

Many employers tried to rely on protective legislation as a defense to Title VII challenges, claiming that such laws made sex a "bona fide occupational qualification" ("BFOQ") for discriminating on the basis of sex. But the Equal Employment Opportunity Commission (federal agency charged with enforcing Title VII) determined that state protective laws could not be the basis for a BFOQ because they did not

"take into account individual capacities, preferences and abilities of individual females and then to discriminate rather than protect." 29 C.F.R. Section 1604.1(b)

Similarly, the EEOC issued a guideline that pregnancy-related classifications are sex-based in violation of Title VII. 29 C.F.R. Section 1604.10(a). The U.S. Supreme Court has before it right now a case that will determine whether the EEOC pregnancy guideline governs judicial decisions.

In any event, existing case law and EEOC guidelines would cast serious doubt on the validity of OSHA standards directed solely towards women, or even toward the subclass of pregnant women. This brings us right back to the initial point we urged, which is that health standards be predicated on a neutral criterion--such as fertility--since both fertile men and women are "at risk" for reproductive hazards.

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