



SOCIETY FOR OCCUPATIONAL AND ENVIRONMENTAL HEALTH

A SUMMARY

CONFERENCE ON WOMEN AND THE WORKPLACE

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The Mayflower Hotel

Washington, D.C.

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WOMEN AND THE WORKPLACE:

AN HISTORIC CONFERENCE

When six hundred women and men met for three days in Washington D. C., last June, to discuss health hazards and other problems being encountered by working women, it was a unique occasion. In fact, it was the first time in the history of the nation that such a meeting had been held. An immediate impetus for the conference, which was called Women and the Workplace, was the growing awareness within the medical and scientific community that a large and ever-increasing number of chemicals and substances commonly used in industry, in agriculture, and in the household are being found to cause cancer, birth defects, miscarriages, and genetic damage. The full dimensions of the problem are as yet unknown, but they appear to be far greater than anyone had ever suspected. The implications of this situation are profound for every man, woman, and child in the land, but especially for the thirty-six million women workers who make up nearly forty per cent of the total work force. Not only are most of these women in their childbearing years, a million and a half of them are giving birth to babies each year!

In addition to the risks posed by toxic substances to the reproductive process and to future generations, speakers and participants at the conference raised and discussed a whole range of

social, economic, legal, and ethical issues which confront working women. At the bottom of these lay the explosive question of sex discrimination. Indeed, one of the dominating themes of the conference was how to protect women's health without discriminating against women.

- * Should industry be allowed, for example, to transfer pregnant women from high-risk areas to safer but lesser paying jobs, thus depriving them of hard-earned economic gains?
- * Should industry be permitted to exclude women of childbearing age from certain jobs?
- * Does such a policy not discriminate against women who do not want children and who have no intention of becoming pregnant?
- * How can such a practice be reconciled with the Occupational Safety and Health Act, which requires employers to provide safe and healthful workplaces for all employees, and the Equal Employment Opportunity Act, which prohibits discrimination against women workers?
- * Why have government scientists and federal regulatory agencies based virtually all their occupational health studies and standards on the experience of male workers even though women make up 40% of the work force?

- * Should the ⁵safe and healthful working conditions required by the Occupational Safety and Health Act also be safe and healthful for the unborn children of pregnant women workers?
- * What should be the policy of federal regulatory agencies toward chemicals that cause damage to the sperm cells of male workers, and that can result in miscarriages by their wives, and in birth defects in their children?

The obvious dilemma posed to the entire society by these questions proved to be the real business and major focus of the Conference on Women and the Workplace, which was held June ^{17-19,} 19~~76~~⁷⁷. The conference was sponsored by the Society for Occupational and Environmental Health, ^(SDEH) the National Institute for Occupational Safety and Health (NIOSH), and the National Foundation-March of Dimes. It was co-sponsored by the Coalition of Labor Union Women, the D. C. Lung Association, the United Church Board for Homeland Ministries, and the Industrial Union Department of the AFL-CIO. Dr. Joseph K. Wagoner, president-elect of the Society for Occupational and Environmental Health, opened the three-day meeting by introducing Dr. Eula Bingham, Associate Director of the Department of Environmental Health at the University of Cincinnati School of Medicine. A co-chairperson of the conference and one of its chief organizers, Dr. Bingham wasted no time in pointing out that the necessity for such a meeting centered around social

issues as well as health issues. "There is little doubt that there has been a failure in the past to recognize women as part of the work force," Dr. Bingham said. "Would you believe that I have had women come up to me when we were organizing this conference and say 'I am really afraid to have a conference on women and the workplace because if health risks are discussed, then women will be excluded from certain occupations?'"

After acknowledging that such a conference "may result in repressive hiring tactics," Dr. Bingham struck a note of harsh reality which would be sounded again and again in the next three days by dozens upon dozens of women. "We already have repressive hiring practices," she told her listeners, "and we have to face up to what is going on. Let's talk about it in public."

Having stated the purpose of the conference, Dr. Bingham went on to describe some of the participants and what she hoped they might accomplish. "I would like to come face to face with the fact that this is a very emotional issue," she declared. "I would expect tempers and emotions to flare in the next few days, and I will be surprised if they don't. We have in our audience women or representatives of women who are fearful of transfer to a lesser paying job because they are female and carry offspring. We have women who are angry and demand their right to seek a job in a lead battery plant. We have women who need to work and who are concerned for their unborn children. We also have in our audience industrial representatives, who are paralyzed with fear over possible liability and lawsuits, and

some who counsel their companies not to hire women in certain areas. I see represented governmental agencies who know they have one of the most difficult health issues to deal with that has emerged."

In conclusion, Dr. Bingham had this to say: "We may even have men in the audience who, when reminded of the fact that genetic damage can occur in males, as well as in females, will help us come up with solutions to so-called women's problems. I am not sure that we are going to arrive at solutions here this week, but I hope that we can have a dialogue, that we can understand the points of view and the positions of industry and labor, and the dilemma of the government in coming up with health standards, and that we can help to solve this health problem."

As things turned out, Dr. Bingham's hopes and expectations were, for the most part, accurate. During the next three days, tempers did, indeed, flare up upon occasion. And emotions were not concealed. Anger and fear were expressed. The positions of industry, labor, and government were stated. Rebuttals--sometimes harsh--were made from the floor. In the end, as Eula Bingham had predicted, no solutions were reached, but a profound and lively dialogue had taken place. Most important of all, one got the feeling that the issues raised by women workers had placed an entirely new focus and imprint upon the pervasive problems posed by industrial disease. One got the impression that, after decades of being discriminated against in the nation's workplaces, women had finally set about to establish themselves as a force to be reckoned with in the future. One had the sense, therefore, that the conference was historic not merely because it was unique,

but because it might well mark a turning point in the condition of working women. At the very least, it was apparent to almost any observer, if only from the quality and the tone of what had been said, that this first Conference on Women and the Workplace was going to be the first of many.

ROSS V. BFS

Part Two

THE INTOLERABLE RISK TO FUTURE GENERATIONS

The first session of the conference was devoted to a discussion of the harmful effects of certain toxic substances upon the offspring of test animals and humans. To begin with, Dr. Marvin Legator, Professor of Preventive Medicine and Community Health at the University of Texas, told the audience that experimental evidence in animal systems, as well as recent epidemiological findings in human populations, left little doubt that many chemicals commonly used in industry, in drugs, in pesticides, or as food additives had the potential of causing genetic abnormalities in human beings. Dr. Legator went on to say that the cause and effect relationship of such chemicals was extremely difficult to determine, and that long-term usage of a compound did not necessarily indicate that it was safe. He then proceeded to give a stark example of what he meant. If thalidomide had caused an increase in mental retardation instead of the unique "flipper" birth defects, we would probably be using this compound now as one of our safest drugs, he said. Having delivered this sobering opinion, Dr. Legator went on to say that quick, short-term testing of the genetic effects of chemical compounds upon bacteria was not an adequate method of determining whether they were safe or not. "We should rely primarily upon animal studies," he declared.

As for which compounds to begin testing, Dr. Legator pointed out that 200 prescription drugs account for nearly 70% of the total drug market, and that only a handful of these compounds had ever been tested for mutagenic activity--meaning their capacity to cause mutations or changes in the genetic material of living cells. "If we look at herbicides, 37 herbicides account for more than 90% of the herbicide market in the United States," he went on. "If we look at insecticides, 31 account for more than 90% of the market, and if we look at fungicides, 19 account for 94% of our market. I think it is rather inexcusable that these widely used materials have not been screened--and in a majority of cases they have not--for the induction of genetic abnormalities."

As for what criteria to use in determining the mutagenicity of the compound, Dr. Legator declared that when, after adequate testing, a compound causes genetic abnormalities in animal systems, it should be considered a mutagen unless it can be proved that it does not cause abnormalities in humans. In summation, Dr. Legator recommended that chemical compounds undergo definitive testing for mutagenicity before being introduced into the marketplace, and that workers exposed to mutagenic substances be tested for chromosomal abnormalities as part of their routine occupational physical examinations.

Dr. Legator was followed to the speaker's podium by Dr. Josef Warkany, who is Professor of Research Pediatrics at the Children's Hospital Research Foundation, in Cincinnati. Dr. Warkany, a recognized pioneer in teratology--the science of birth defects--observed that the thalidomide catastrophe made the general public aware

of the fact that a pregnant woman's exposure to a toxic substance could endanger her unborn child. "The shock produced by this event resulted in r^eactions which were partly healthy and partly unjustified, emotional, and unscientific," he declared.

Dr. Warkany went on to say that very few teratogens--substances or agents that can cause birth defects when pregnant women are exposed to them--had been so far identified by medical scientists. He then listed iodine deficiency, carbon monoxide, large doses of X-rays, organic mercury, thalidomide, certain miscarriage preventives, and warfarin as having been proven to cause congenital abnormalities and birth defects in human beings. After listing a number of substances known to be teratogenic in test animals but not in humans, Dr. Warkany pointed out that animal experiments in teratology must be interpreted with great caution, and that the results of such experiments could not be extrapolated automatically to human situations. "If one finds a chemical compound teratogenic in animals, it should alert us to vigilance in human conditions," he said.

Diethylstilbestrol, known as DES, is a synthetic estrogen that was widely used during the 1940's, 1950's and 1960's for the treatment of threatened miscarriage. In 1971, it was discovered that some of the daughters of women who had taken DES were being afflicted with a rare type of vaginal tumor. Since DES is the first known trans-placental carcinogen--a cancer-producing substance that can cross the placenta to the fetus--many medical scientists believe that the lessons

learned from it can be applied to the growing number of suspected transplacental carcinogens presently used in industry. For this reason DES was a much discussed topic at the conference. Indeed, Dr. John A. McLachlan, a developmental toxicologist at the National Institute of Environmental Health Sciences, devoted most of his discussion to the effects of DES in mice.

According to Dr. McLachlan, within half an hour after it is administered to a mother mouse, DES is found in the same amount in the blood of the fetus. Moreover, by this time, there is a threefold accumulation of the chemical in the reproductive tract of the fetus. Thus Dr. McLachlan and his associates have shown not only the extent to which DES crosses the placenta of test animals, but the extent to which it accumulates in fetal target tissue, which becomes the site for the subsequent development of cancer. Dr. McLachlan and his co-workers also studied the effect of pre-natal exposure to DES in male mice, and discovered that the compound induced a certain amount of sterility in these animals, as well as an increased incidence of impaired reproductive tract development.

A striking correlation between Dr. McLachlan's animal tests and human findings was presented by the next speaker, Dr. William B. Gill, Associate Professor in the Department of Surgery and Urology at the University of Chicago, who has studied the transplacental effects of DES upon human males. After examining more than 160 men who had been prenatally exposed to DES, and more than 160 men who had not been exposed, Dr. Gill and his co-workers found that twenty-five per cent

of the exposed men had abnormal lesions of the genital tract, as compared with only six per cent of the unexposed group. They also found a far greater number of abnormal sperm counts in the men whose mothers had been treated with DES. According to Dr. Gill, since these men are mostly in their early twenties, it will be another decade or so before their actual infertility rate can be assessed. After reminding his listeners that Dr. McLachlan had found tumors and impairment in the genital tracts of male mice whose mothers had been exposed to DES, Dr. Gill pointed out that it was too early to determine whether the high incidence of abnormal lesions found in the genital tracts of the sons of women who took DES will prove to be the precursors of cancer.

The next speaker, Dr. William Welch of the Harvard Medical School, was eminently qualified to talk about the biological effects of DES, for he is a colleague of Dr. Arthur L. Herbst of the Massachusetts General Hospital, who first discovered the relationship between DES and cancer in the daughters of women who had taken the drug during pregnancy. According to Dr. Welch, DES is a potent estrogenic compound that was first synthesized in 1938, and that was subsequently used to prevent spontaneous abortion. During a twenty year period, between half a million and two million women are believed to have taken DES during pregnancy. Then, between 1966 and 1969, Dr. Herbst and several colleagues unexpectedly encountered seven cases of young women with clear-cell adenocarcinoma of the vagina--a tumor that was extremely rare at the time.

Dr. Welch went on to say that further investigation revealed that all of these young women were the daughters of mothers who had taken DES while pregnant, and that when this finding was confirmed by other investigations, a warning against the use of the drug during pregnancy was issued by the Food and Drug Administration. Dr. Welch also told his audience that as of June 1976, more than 150 cases of adenocarcinoma of the vagina or the cervix with documented history of DES exposure had been studied around the world, and that in every case for which detailed medical histories were available, the drug had been administered before the eighteenth week of pregnancy.

According to Dr. Welch, the ages of the young women afflicted with adenocarcinoma of the vagina ranged from 7 to 28 years, with the average age in the late teens. He said that an interesting observation of the DES study was the increased frequency of the cancer after the age of 14, which suggests that some event related to puberty, such as the secretion of estrogen by the patient's own ovaries, may be related to the development of this tumor. Dr. Welch went on to say that in addition to clear-cell adenocarcinoma of the vagina and the cervix, young women whose mothers had taken DES during pregnancy were experiencing non-malignant abnormalities of the vagina. For example, depending upon the techniques and definitions used by individual investigators, anywhere from 35% to 90% of the women were found to have vaginal adenositis-- an abnormal but benign condition in which glandular tissue is present in the vaginal lining. Moreover, 20% of the women were found to have vaginal and cervical ridges or collars.

Dr. Welch told his listeners that three major questions remained to be answered concerning vaginal adenositis.

1. What happens to it as patients grow older?

2. Is adenosis the precursor of cancer?
3. What is the recommended treatment, if any?

"At the present time, the natural history of adenosis is unknown," Dr. Welch continued. "It is clear that adenosis provides the bed from which the cancers arise, but actual malignant transformation of adenosis to cancer has not been demonstrated to date." Dr. Welch went on to say that some investigators were already predicting that as the population of women who had been prenatally exposed to DES grows older, they will experience an increased rate of squamous cell malignancy. He concluded his talk by telling his listeners that because of the unanswered questions about vaginal and cervical abnormalities associated with prenatal exposure to DES, the Division of Cancer Control and Rehabilitation of the National Cancer Institute had recently commissioned a research project to study the problem.

The next paper at the morning session was delivered by Dr. Peter F. Infante, an epidemiologist with the National Institute for Occupational Safety and Health, who described cases of blood disease and childhood tumors associated with exposure to chlorinated hydrocarbon pesticides such as chlordane. According to Dr. Infante, chlordane is an active ingredient in many household and garden pesticides that have been in common use for the past twenty-five years. He said that about 25 million pounds of chlordane were used in the United States during 1975; that 70% of this was applied around the home; and that 30% was used in agriculture, primarily on the corn crop. Dr. Infante went on

to tell his listeners that there was evidence that chlordane and heptachlor, as well as other chlorinated hydrocarbon pesticides, cause cancer in test animals. In addition, low doses of heptachlor given to infant rats have induced rare kidney tumors in these animals. Dr. Infante also pointed out that heptachlor residues had been detected in the blood and organs of stillborn human infants, indicating transplacental passage, and that chlordane had been found to be mutagenic in microbial test systems. "To date, no epidemiological studies have been undertaken to negate the laboratory studies indicating the carcinogenicity and mutagenicity of chlordane," said Dr. Infante, who did not conceal his dismay over this situation. "Nor is there currently a reporting mechanism to gather data on pesticide-related pathologic conditions in our population. For these reasons, five new cases of childhood tumors associated with prenatal and postnatal exposure to chlordane, plus six additional cases of aplastic anemia and acute leukemia are presented."

Dr. Infante then proceeded to describe five out of a total of fourteen cases of neuroblastoma--a tumor of the nervous system--which had been diagnosed in children admitted to a single pediatric hospital between December of 1974 and February of 1976. Two of the children's homes had been treated with chlordane for termite or roach infestation prior to their birth, and in the three other cases, the chlordane was applied in or around the home after the children had been born. Dr. Infante also described the six new cases of aplastic anemia and leukemia associated with chlordane pesticide exposure, which had been diagnosed in people ranging from seven to sixty-eight years of age.

At this point, Dr. Infante told his listeners that between 1955

and 1961, the American Medical Association's Study Group on Blood Dyscrasia (blood abnormalities) had published 60 cases of abnormal blood disease associated with exposure to chlordane, lindane, and DDT, but that this reporting mechanism was no longer in use. "During the same period, an additional twenty cases of aplastic anemia associated with DDT and lindane were reported from Mexico," Dr. Infante continued. "Thus, the new cases of aplastic anemia are consistent with previous reports in the literature."

In conclusion, Dr. Infante recommended that the possibility that chlordane and other chlorinated hydrocarbon pesticides were trans-placentally carcinogenic be thoroughly investigated in test animals. "Although the Environmental Protection Agency has recently temporarily suspended the manufacture of chlordane for agricultural purposes, because of its carcinogenic effects, chlordane use is still being permitted for termite control," he warned. "Obviously, therefore, there is need for formal epidemiologic study to evaluate the long-term risk associated with home exposure to chlordane, with particular reference to childhood tumors and blood dyscrasia."

The wide-ranging selection of speakers for the conference was apparent when Aileen M. Smith, a free-lance journalist from New York City took the podium to discuss mercury poisoning and birth defects in Japan. Ms. Smith is a co-author of the well known book, Minamata, whose photographs and text provide a chilling description of the horrors of Minamata Disease--the first known occurrence of widespread methyl mercury poisoning caused by man-made environmental pollution.

She began by telling her listeners that Minamata, a town of some 50,000 people, is located on the coast of Japan's southern island of Kyushu, and that in addition to fishing, the main industry of the city ~~is~~ for many years has been the Chisso Corporation's Minamata chemical factory.

"Unusual changes were detected in Minamata Bay as long ago as 1950," Ms. Smith continued. "Fish floated on the surface of the sea, shellfish frequently perished, and some of the seaweed died. In 1952, some birds such as the crow and the amedori--a type of sea bird--were seen to drop into the ~~ocean~~ while flying. By 1953, not only ~~cats~~ but even some pigs and dogs went mad and died. The cats' ~~dancing disease~~--so-called by the local inhabitants--was particularly striking. The cats would start to have convulsions and go around in circles, and often jump into the sea. However, fish continued to live in Minamata Bay, and fishermen continued to go out and catch them, and the people continued to eat them."

Ms. Smith went on to say that in April of 1956, a six-year-old girl was admitted to the pediatrics department of Chisso's Minamata Factory hospital with symptoms of brain damage--disturbances of gait and speech, as well as delerium--and that within five weeks, her younger sister and five members of the neighboring family were also found to be suffering from the same symptoms. "An investigation quickly uncovered thirty cases," Ms. Smith continued. "By October of 1956, the cause was tracked down to some type of heavy metal poisoning from fish consumption. And by October of 1959, the causal element was identified as methyl-mercury from the waste water of Chisso's acetaldehyde

and vinyl chloride facilities. Indeed, fish and shellfish collected in Minamata Bay showed high mercury content ranging from around five parts per million to around thirty-nine parts per million."

According to Ms. Smith, however, fishermen continued to take fish from Minamata Bay, and the Chisso Corporation continued to dump waste containing methyl mercury into its waters. As a result, by the end of 1952, 121 officially verified patients had been afflicted with Minamata Disease, of whom 46 had died. "Although the outbreak was thought to be over, a major question still remained unanswered," Ms. Smith said. "Many cases of congenital idiocy, accompanied by various neurological symptoms, had occurred on the coast of Minamata during the same period as the outbreak of Minamata Disease."

After telling her listeners that these children were generally diagnosed as having cerebral palsy, Ms. Smith said that by 1962 it was realized that they had been poisoned by methyl mercury while in the womb. Indeed, a factor shared by virtually all of the mentally retarded and often deformed children (there are presently some forty officially recognized cases of congenital Minamata Disease) is that their mothers were known to have eaten large quantities of fish from Minamata Bay during pregnancy. Moreover, because it is customary in that part of Japan to save the umbilical cord of a child, it has even been possible to ascertain the rate at which methyl mercury from the contaminated fish passed through the placenta of the mother to the fetus!

Ms. Smith continued her account by saying that, in 1970, eight years after the outbreak was thought to be over, surveys taken by independent medical researchers indicated that the effect of methyl mercury

on the general population of Minamata had been greatly underestimated. These surveys showed that there had been a significant increase of still births and miscarriages during the 1953-1960 period. In addition, examinations of 223 junior high school students, who had been born during this time in the most heavily affected area of the city, revealed mental deficiency in 18%; sensory disturbances in 21%; speech impairment in 12%; and clumsy movement in 9%.

"The present safety level of total mercury in fish is four-tenths of one part per million," Ms. Smith said. "This level was determined on the basis of a safety factor of ten. It was determined on the basis that an adult male weighing fifty kilograms and consuming an average amount of fish will not get Minamata Disease by eating fish containing less than four-tenths of one part per million of mercury." Ms. Smith went on to give the opinion that the present safety level for mercury was inadequate. "The safety level should be calculated to avoid even the lightest of symptoms," she declared. "It should be calculated to be safe for those consuming more than the average amount of fish and shellfish. Also, the calculation should consider the pregnant woman, the young and the weak, as well as the healthy adult. As yet there are no experiments to show how safe the presently calculated safety level is, when amounts just on the so-called safe side are consumed continuously over a period of many years. And, finally, in this age of multiple pollutants, other pollutants should be considered, when safety levels are determined. Therefore, when these various factors are considered, it becomes clear that it is necessary to reexamine the present approach

in figuring a safety level for mercury.

At this point, Professor Bingham invited each of the three discussion leaders for the morning session to make brief comments on what they had heard. Dr. Charles Shaw, Professor of Biology at the University of Texas' Anderson Hospital and Tumor Institute, said he believed it was important for the conference to recognize that there were highly important metabolic differences between men and women, and that these differences were carried into the workplace. Dr. Umberto Saffiotti, chief of the Experimental Pathology Branch of the National Cancer Institute, pointed out that one of the major challenges in cancer research was the task of trying to correlate experiments in animals with the experience of human beings. Dr. Eldon Sutton, Vice President for Research at the University of Texas at Galveston, observed that another major problem was how to identify and protect people who are especially sensitive to environmental agents without discriminating against their right to equal opportunity.

During the general comment and question period, a member of the audience pointed out that DES was a very powerful chemical which is shipped in bags, and that its dust is widely disseminated when it is mixed with animal feed. Another listener asked Dr. Infante what was being done about limiting public access to chemicals such as chlordane. Dr. Infante replied that existing stocks of chlordane pesticides were still being sold across the country, and that the containers bore no cautionary label other than the customary euphemism, "Keep Out of Reach of Children."

When Professor Bingham called for the luncheon break, it was apparent that the conference had gotten off to a fine start, and that some tremendously important issues had been raised. One of the most important of these was the fact that while profound physical and biological differences exist between men and women, both sexes are vulnerable to genetic damage caused by environmental agents, and that a desirable solution to this situation is to make the workplace safe and healthy for men, women, and for their unborn children. Secondly, in the discussions concerning DES and chlordane, it was apparent that if the long-term transplacental effects of these compounds had been thoroughly investigated in animal studies prior to their introduction into the marketplace, much misery might have been avoided. Which, in turn, simply pointed up the crucial need for a strong Toxic Substances Control Act that would mandate carcinogenic, mutagenic, and teratogenic studies for all new chemicals and substances. And finally, Aileen Smith's harrowing account of what had happened to the fish, cats, and citizens of Minamata could scarcely fail to be appreciated by the members of her audience, who, after all, were living in the United States in a year in which Kepone had poisoned workers in Hopewell, Virginia, and found its way into fish in the St. James River; a year in which commercial fishing was banned in the Hudson River and in various lakes and rivers in Canada because of the pervasive contamination of fish with polychlorinated-biphenyls (PCB); a year in which thousands of farm animals had been slaughtered in Michigan as a result of disease caused by the contamination of animal feed with polybrominated-biphenyls^(PBB), which had also found their way into the tissues of many Michigan farmers and their families; and a year in which, because of sewage-sludge dumping, a vast

dead sea--a sea virtually devoid of all marine life--had been discovered just outside New York harbor.

Indeed, if the morning session of the Conference on Women and the Workplace posed an overriding question, it was this: Was it legacy or affliction that we would be leaving to future generations?

Part Three

SOME HIGHLY SUSPICIOUS CHEMICALS

The dimensions of the toxic chemical problem confronting today's society were hinted at by Dr. John Finklea, ^Ddirector of the National Institute for Occupational Safety and Health, who opened the second session of the conference by predicting that within a year or so a growing number of halogenated compounds--chemicals similar in structure to vinyl chloride--would be implicated as posing a hazard to the health of workers. Dr. Finklea then introduced Dr. Thomas Corbett, a clinical investigator at the U. S. Veterans Administration Hospital in Ann Arbor, Michigan, who has spent much of the past six years studying cancer, miscarriages, and birth defects associated with the operating room environment. Dr. Corbett told his audience that about 20 million anesthetics are administered to patients each year in 25,000 operating rooms throughout the United States; that about 50,000 operating room personnel are exposed daily to low concentrations of anesthetic gases; and that 35,000 of these people are women. He then went on to describe various studies that had been conducted of the effects of the operating room environment upon nurse anesthetists, women physician anesthesiologists, and their children. According to Dr. Corbett, these studies showed that there was a significantly higher incidence of spontaneous abortion among women who work in operating rooms, as well as a significantly higher rate of birth defects among their children. Of special importance was a study

of 50,000 operating room personnel that had been undertaken by the American Society of Anesthesiologists. This study showed that women working in operating rooms were experiencing up to twice the incidence of spontaneous abortion as other women. It also showed that the children of these women were suffering birth defects at a rate of one and a half to two times that of the children of women who did not work in operating rooms. Moreover, it indicated that there was a 25% increase in the risk of birth defects in the children of unexposed wives of male anesthesiologists, proving once again that chemically-induced genetic damage was a male as well as a female problem.

Dr. Corbett noted that most inhalation anesthetics were halogenated hydrocarbons or halogenated ethers, and that a number of related chemicals were already known to produce cancer in test animals and in humans. "The data presented here raise enough serious questions to justify regulations enforcing the installation and employment of gas-scavenging devices in the operating room," he said. "Future research must be directed toward identification of those anesthetics which are embryolethal, teratogenic, mutagenic, or carcinogenic, with subsequent limitation or removal of these chemicals from the anesthesiologist's arsenal."

The next speaker was Dr. Joseph K. Wagoner, Chief of NIOSH's Industry-wide Studies Branch, who discussed the genetic effects associated with a number of industrial chemicals. Dr. Wagoner began by pointing out that animal inhalation studies first showed that vinyl chloride could produce cancer of the brain, the liver, the lung, and

the lymphatic system, and that excessive deaths due to such cancers were subsequently discovered among vinyl chloride workers who had inhaled the chemical in factories around the world. "Vinyl chloride was also shown to induce tumors in the offspring of exposed pregnant rats," Dr. Wagoner continued. "In addition, children born in communities adjacent to vinyl chloride polymerization facilities were shown to have an increased risk of birth defects."

Dr. Wagoner stated that these observations had led some people in government and many people in industry to propose that women of reproductive age be excluded from employment in vinyl chloride factories. He questioned the validity of this approach, however, by pointing out that the toxicity of vinyl chloride to future generations could occur not only through the exposure of pregnant women, but through the occupational exposure of men. After reviewing a NIOSH survey showing an association between male exposure to vinyl chloride and an increase of fetal death in the children of these men, Wagoner evoked strong applause from the audience by declaring that "This spectrum of evidence for the mutagenicity of vinyl chloride emphatically demonstrates that the only prudent public health approach to vinyl chloride is through control of the exposure at its source and not through the exclusion of women in the workplace." Wagoner then described some animal studies indicating that vinylidene chloride, trichloroethylene, and chloroprene-- industrial compounds similar in chemical structure to vinyl chloride-- may also cause cancer and genetic damage. "Will society once again require the observation of fetal deaths before regulatory controls are implemented?" he asked. "Or will the legacy of society to future generations be the

rapid reduction of human exposure to mutagens at their industrial source? The question is now before us all."

An example of the complexity of conducting studies to evaluate possible adverse health effects of industrial chemicals became apparent when Dr. Larry D. Edmonds, a health services officer from the Birth Defects Branch of the Center for Disease Control (CDC) in Atlanta, Georgia, presented a study he and some colleagues had conducted of the possible relationship between birth defects and exposure to vinyl chloride. Dr. Edmonds started out by telling his listeners that one of the first reports relating vinyl chloride exposure to birth defects was presented by Dr. Peter Infante, who, while with the Ohio Department of Health, had noted increased rates of birth defects between 1970 and 1973 in three Ohio communities, where polyvinyl chloride manufacturing plants were located. Most of these excess birth defects were found in Painesville, a city located near Cleveland on Lake Erie, which contains two separate polyvinyl chloride plants. For this reason, using data provided by the CDC's Birth Defects Monitoring Program, Dr. Edmonds and his colleagues set out to investigate the situation in Painesville, where the number of birth defects in a single hospital proved to be about twice the national average.

After comparing fifteen cases of birth^{de}fects found at the hospital with fifteen control cases, Dr. Edmonds and his co-workers found that none of the parents of the children who suffered the birth defects had ever worked at either of the city's polyvinyl chloride

plants, and that no parent in either group lived within two miles of either factory. They concluded, therefore, that from the available data no association could be found between exposure to vinyl chloride and the higher rate of birth defects in Painesville. Dr. Edmonds went on to say that similar conclusions had been drawn from a study made in Kanawha County, West Virginia, where there has been a polyvinyl chloride plant in operation since 1935. According to Dr. Edmonds, however, an unexplained cluster of birth defect cases was found in an area located within three miles northwest of the factory.

During the question and comment period, Dr. Infante suggested that the clustering of cases northwest of this plant might be due to the fact that the prevailing wind direction was from the southwest. Dr. Edmonds replied that wind data records for Kanawha County had been studied, and that they did not support such a conclusion. He went on to say that the CDC would continue to monitor and study counties where excess birth defects were occurring. Dr. Infante then said that he was concerned that Dr. Edmonds and his colleagues had found a significant excess of birth defects of the central nervous system in four out of seventeen communities with vinyl chloride polymerization plants, and that while this did not prove that exposure to vinyl chloride caused birth defects, it should certainly be the subject of further investigation.

Part Four

WHAT TO DO ABOUT WOMEN IN HIGH-RISK AREAS?

--A Complicated and Controversial Question

An industry viewpoint on this very sensitive problem was presented by Dr. Harold Gordon, ^Mmedical ^Ddirector of the Dow Chemical Corporation, who declared at the outset that it was unacceptable to try to solve the problem by not hiring women for production jobs. "The only proper way to deal with the situation is by controlling the hazards to such a degree that the control is equally appropriate for both men and women," Dr. Gordon said. He then went on to tell the audience that Dow has a policy of not exposing women workers to known teratogens, and that women workers should not be exposed to chemicals that are known to be transplacentally carcinogenic in humans. Dr. Gordon did not believe, however, that it was possible or practical to avoid exposing women workers to chemicals that are either transplacentally carcinogenic or teratogenic in test animals. As for known mutagens and carcinogens, Dr. Gordon declared that "What is protective for men should be protective for women, and we should set our standards accordingly." He concluded his talk by reminding his listeners that in addition to toxic substances used in industry, cigarette smoking, certain household chemicals, and some over-the-counter medications provide harmful exposures that should not be overlooked in considering ways to protect the public health.

The attitude of labor toward high-risk placement of women workers was expressed by Sylvia Krekel, an occupational health and safety specialist from the Oil, Chemical & Atomic Workers Union, who felt that the conference underscored the growing recognition of women as an integral rather than peripheral part of the work force. "The sexist theory that women work for pin money has been supplanted," Ms. Krekel declared, "by the acknowledgement that women are real workers who support households rather than merely supplementing the family income." She went on to say that exposure levels for hazardous chemicals should not be set because of special health problems encountered by women, but should be set low enough to protect all workers. "Why is it that the lead industry has refused to hire fertile women when studies over the past century indicate that men suffer decreases in fertility from lead absorption as well as lead poisoning?" she asked. "If the lead industry is seriously concerned about the reproduction effects of lead exposure, then the emphasis should be placed on the reproductive capacity of both male and female."

After citing current radiation standards as another example of discrimination against women workers, Ms. Krekel said that "Much of the clamor over women workers in high-risk occupations is not based on a serious concern for worker health, but is often little more than a smokescreen to conceal industry's reluctance to place a priority on people rather than profit." She went on to tell the audience that screening women from so-called high-risk areas was, in fact, triple discrimination. First of all, according to Ms. Krekel, women find it difficult to get jobs. Secondly, the woman worker is the first to be

laid off because she invariably has the least seniority. And, finally, if a woman worker becomes pregnant and is transferred for the sake of her unborn child, she usually loses the little seniority she has acquired, and is often forced to take a lower paying job.

At this point, Ms. Krekel declared that the solution to the problem was simple and unequivocal. "The Occupational Safety and Health Act clearly guarantees every working man and woman in the nation a safe and healthful workplace," she said. "Nowhere in the Act is there any distinction made between the sexes in terms of working conditions." Ms. Krekel concluded her talk by stating that "Health standards should be set at levels low enough to protect everyone in the workplace, including the fetus," and that "any protective transfer of women workers must be accompanied by protection of the workers' seniority and rate of pay."

A legislative viewpoint toward high-risk placement was offered by Ms. Peggy Taylor, who is a staff member of the United States Senate Subcommittee on Labor. Ms. Taylor started out by observing that the conference had heard considerable discussion of the hazards posed by toxic substances to the reproductive systems of both men and women. "Once we have a group of people as broad as this, we're no longer talking about a special, highly susceptible group which needs to be accorded special treatment," she declared. "When the issue is the hazard to the reproductive systems of both men and women, we must address ourselves to the setting of occupational health standards that take into account research concerning the impaired ability of either sex to produce healthy children."

Ms. Taylor reminded her listeners that the Occupational Safety and Health Act requires the government to set standards for toxic substances so that employees will not suffer impaired health as a result of workplace exposures. "Under the Equal Employment Opportunity Act, a company must prove that an action which treats women differently from men is a business necessity," she went on. "Otherwise, discrimination will be assumed." Ms. Taylor then said that under the proposed National Workers Compensation Act there was no provision for compensating a child who had been injured by exposure to a toxic substance prior to birth. She also said that the Senate version of the proposed Toxic Substances Control Act stated that test data for cancer, genetic damage, and birth defects should be considered in the promulgation of health standards. "The laws on the books do not provide a clear solution," Ms. Taylor concluded. "In fact, they could in practice engender conflicting responsibilities for the protection of women. I would be less than candid if I did not admit that it is not at all clear what a successful legislative solution to this dilemma is, or even if it lends itself to legislative solution."

During the formal discussion that followed Ms. Taylor's remarks, Dr. Samuel Milham Jr., of the Washington State Department of Social and Health Services, observed that over the past 50 years, the miscarriage rate in the United States had remained stable; that the central nervous system defect rate had dropped sharply; and that the fetal death rate had also dropped considerably. "I'm certain that there

are infants ^{who} ~~are~~ are defective today as a result of their mothers' exposure," he said. "But common sense tells me...that the problem is probably not general and probably not severe."

The second discussion leader of the afternoon session was Dr. Bertram Carnow, who is Professor and Director of Occupational and Environmental Medicine at the University of Illinois School of Public Health. Dr. Carnow interjected some irony into the proceedings by observing that if vinyl chloride caused genetic damage in men, and if women married to lead workers produce defective children, then men as well as women should be removed from these high-risk areas. "So we'll either wind up with sixty-year-old eunuchs in the workplace, or we'll have to eliminate the teratogen," Dr. Carnow continued. "I suggest that it would be better to eliminate the teratogen."

When the laughter and applause that greeted this remark had subsided, Dr. Carnow urged that occupational health standards be set for the ⁺protection of high-risk populations, including pregnant women, so that not just strong survivor populations would receive consideration. "I think that many of the standards in the workplace are going to require serious reassessment in order that dose-response relationships be carefully studied, and that exposure levels be set in the workplace and in the community which would protect virtually all of the population. "If we do this, then we can look at the pregnant woman as a very special case, and make every effort to protect her without sacrificing her economic status," he concluded.

Tough questions and controversial comments were the order of

th day when the focus shifted from the podium to the floor of the conference. Clara Schiffer, a program analyst with HEW and a co-chairperson of the conference, asked Dr. Gordon to tell the audience what technological changes Dow was instituting in order to reduce occupational hazards. Dr. Gordon replied that Dow has one of the finest toxicological laboratories in industry, as well as a staff of excellent industrial hygienists, and that "every attempt is being made to reduce work exposures."

A little later, someone asked Dr. Gordon whether Dow has a formal policy of extending the same degree of protection to workers in its foreign plants. "Or are Korean, Brazilian, Mexican, Venezuelan, and Taiwanese workers considered less susceptible than U. S. workers?" Dr. Gordon was asked. He replied emphatically that health standards were in effect in Dow plants everywhere in the world. "Our rule is that we abide by the local standards, or the Dow standards, whichever are more stringent," Dr. Gordon declared.

When Sylvia Krekel was asked to state specifically what the OCAW was doing about the placement of workers in high-risk areas, she referred the question to Anthony Mazzocchi, who is the union's legislative director. Mazzocchi answered the question with characteristic bluntness. "We have taken no action because we don't know what to do," he said. "We don't know what the facts are. There isn't a single worker, including those at Dow, who knows what the hell he works with."

Mazzocchi declared that if workers knew what substances they were handling, they would be able to make intelligent choices about whether they wished to continue doing so. "In order to properly rep-

resent people in the workplace, we must know what affects them," he continued. "Yet there isn't a single industry in this country which is submitting that data to us." Mazzocchi concluded his comments by taking issue with the kind of paternalism he claimed had been expressed by Dr. Gordon. "We know what is good for you," he intoned sarcastically. "We will tell you when something is wrong. Well, we are reading a lot of death certificates from Dow and other companies which tell us that something is up."

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When Mazzocchi had finished, Dr. Finklea of NIOSH observed that the federal government also has a responsibility to make sure that workers receive the proper information about their exposure to health hazards. "And we haven't done our job," he admitted.

Dr. Finklea then asked Dr. Gordon if he wished to comment.

"What can I say?" Dr. Gordon responded.

"You could say 'amen,'" Dr. Finklea replied with a smile.

Part Five .

TELLING IT LIKE IT IS

On the first night of the conference, the task force on occupational health of the Coalition of Labor Union Women held an open forum that gave working women and men a chance to speak their minds. The session began with a panel discussion by a group of six women workers, who were introduced by Andrea Hricko, a health coordinator for the Labor Occupational Health Program at the University of California at Berkeley, and a co-author of a new handbook for women workers entitled "Working for Your Life."

The first panelist was Sheri Stephen, who is employed in an auto frame and stamping plant in Flint, Michigan. "We have a lot of arc welding done in the plant," Ms. Stephen said. "We make frames for trucks, Cadillacs, and small and large chevrolts. Until recently, we didn't have any ventilation at all in the area. Now we have hood-type ventilators. We need more. They are not adequate. People are passing out from the fumes." Ms. Stephen went on to say that people working in an area where zinc coating is sprayed on the insides of fenders were fainting, and complaining of dizziness and headaches, but that the company was doing nothing about the situation.

Karen Osborne, who works in an auto parts plant, in Dayton, Ohio, said that the main hazard in her shop was asbestos. "Our plant is one of the largest makers of disc brake pads," Ms. Osborne told her

listeners, "and in the areas where they mix, form, cure, and grind the asbestos, there is no ventilation as far as air-moving equipment." Ms. Osborne went on to say that there was an overhead ventilation system that supposedly sucks up asbestos particles in the air above the machinery, but that when the system breaks down everybody had to keep on working. "The company doesn't care," she declared. "They want their production out." Ms. Osborne concluded by saying that OSEA had inspected the plant and fined the company, but that there had been no improvement whatsoever in the working conditions.

Mary McDonald, who works in an electrical manufacturing plant in Ontario, California, told the forum that when the company suddenly discontinued the use of a cord they had been putting on electrical irons for many years, she had her co-workers become suspicious. "We sent off a sample to find out exactly what was in this cord, and we discovered that it was asbestos," she said. "So we started checking into what asbestos was all about. It is a very scary thing. Especially for the workers in the shop, and especially when you are working with it without knowledge."

Ms. McDonald said she had been working for the General Electric Company for 18½ years, and that during that whole time asbestos dust could be seen floating all over the plant. "You would have a cup of coffee," she told her listeners. "The white fuzz--you just wipe it to the side and you drink the coffee. And we are paying for that now." Ms. McDonald went on to say that degreasing fluids and acids being used in the plant also posed a hazard to the health of the employees. "The variety of problems that have now surfaced in

our plant almost seems like a bomb," she declared.

The next panelist was Jeanne Reilly, who works for the Hooker Chemical Corporation in Niagara Falls. "There are 110 ~~chemicals~~ ^{chemicals} made currently at the Niagara plant complex, which is the largest ~~chemical~~ ^{chemical} plant complex in New York State," she said. "It covers 365 acres in the city of Niagara Falls, and if you have ever been there, then you have smelled the Hooker Chemical Corporation."

Ms. Reilly went on to say that Hooker makes a number of chlorinated hydrocarbon compounds, including C56, which is the trademark name for a constituent of Kepone. "We make many compounds whose chemical formulations the company refuses to tell the employees," she declared. "They simply tell us it is hazardous. We were told, for example, that lindane...was bad for us. They didn't tell us that it was extremely poisonous, and that it could be absorbed by the skin." Ms. Reilly informed her listeners that OSHA had just fined the Hooker Corporation \$900. "And do you know why?" she asked. "Because there were four men killed there, in December, in an explosion in a chlorine gas collecting system." Ms. Reilly went on to claim that a lot of workers at the plant were being exposed to chlorine gas because of failures in the ventilation system, and that the company apparently did not consider this situation serious. "But your eyes hurt," she declared. "And you can taste it. And you might find out the next day that you have a headache."

Myrtis Frazier works in a plastic factory in Flint, Michigan, which manufactures grills for cars and trucks. "I had a respiratory

problem with fiberglass," she said. "I had to take these parts out of a machine. After they came out, I had to stack them, trim them, and grind up the scrap that was left over. In doing this, I somehow inhaled some of the fumes and some of the particles so that I could hardly breathe." According to Ms. Frazier, when she took her complaint to the plant management, she was told that the man before her had had no trouble, and that because she was a woman she was supposed to be more durable. "I was supposed to set a 'good example,'" she said. "That's a quote, unquote, from my supervisor."

The last of the six discussion panelists was Leiza Zadel, who works as a nurse in the pediatrics ward of a hospital in Boston. Ms. Zadel told the forum that everyone on the hospital floor is occasionally exposed to radiation from portable X-ray machines. ^{who} "When the X-ray machine is being used, everyone has to stay in the room with the patient should have a lead apron," she said. "It doesn't always happen. Sometimes the portable X-rays are done in the hall, and there is no way to shield people walking up and down the hall. So dietary people, house-keeping people, all the nursing staff, nurses aides, registered nurses--the whole crew--everyone who happens to be around when the machine is up there is exposed to radiation."

When Leiza Zadel had finished, the discussion turned to the subject of OSHA. "Primarily OSHA comes in whenever there is a fatality on the job," Jeanne Reilly said. "It catches their eye, sort of." Ms. Reilly went on to say that after the explosion that killed the four men at the Hooker Chemical Corporation plant, in Niagara Falls, OSHA

inspectors conducted a major inspection, which failed to determine the cause of the explosion, but which found that Hooker had failed to follow standard industry procedures for checking pressure releases on containers of chlorine under high pressure. "They probably never will know what caused that explosion, but they do know that prior to that time, they had a lot of complaints from the men who use the 53rd Street locker room, because chlorine was constantly escaping," she said. "On occasion, the shift couldn't get in to change out of their work clothes, and they went home because the locker room was filled with chlorine."

At this point, Kathy Hunninen, who is a health inspector for the Tennessee State OSHA, came to the front of the room and told the audience that she had seen almost all of the hazardous working conditions described by members of the panel. "I have been in plants where these exact same kinds of things are going on," she said. "And I know that citations are being issued. I know the penalty process, and I know that fines mean nothing." Ms. Hunninen went on to say that in her opinion labor unions should make more effort to educate their members about how to follow up on OSHA citations, because industry was contesting a great many of them.

Later in the evening, Dan Thomas, of the United Auto Worker's Safety Office, in Detroit, told the forum that some health hazards could exist in plants that appeared to be very clean. "Just last week, I was in a small plant in Indiana, which makes mercury relay switches," he said. "If you looked in the plant, it would probably look cleaner than this room--a nice shiny floor, good lighting, fine equipment, and also

little pools of mercury everywhere , and people working very close to that mercury."

Mr. Thomas went on to say that when he inspected the plant and took measurements with a mercury vapor meter, he found that some mercury air levels were exceeding the permissible level. "Now the company didn't know that, although they had their own mercury vapor meter," Mr. Thomas said. "The women were leaning over their machines, working very close, just inches away from open mercury, and the company decided a good spot to do the sampling was on a bench 20 feet behind them. Now that is all right for an area sample, but it is not a breathing zone sample, and that is what we need to take."

At this point, Mr. Thomas said that many workers in the plant were complaining of suspicious symptoms. "Their teeth were falling out and they had problems with their gums," he said. "Now that is something which is very consistent with what you would expect from people exposed to mercury." Mr. Thomas also told the forum that the employees of this plant were complaining of nervous system problems. "They are irritable and anxious, and were on tranquilizers to keep them from being ornery and mean," he said. "Now, again, those sorts of symptoms are what you would expect from people working around mercury." Mr. Thomas concluded his remarks by reminding his listeners of the morning discussion about Minamata Disease. "We learned today about Minamata Disease and organic mercury as something that can affect the fetus and children," he said. "Is there any research about inorganic mercury as something that could cause problems for offspring?"

After Dan Thomas had spoken, Steve Wodka of the OCAW talked about tactics that can be used to correct health hazards. Wodka advised workers to find out first what chemicals and substances they

were handling. Secondly, he told them to find out what their levels of exposure were. "Another thing to find out is what has been the morbidity and mortality experience of the people who have worked in the plant," he said. "Every company that has a union contract most likely has a medical insurance plan and a life insurance plan, and the companies collect these records year after year. They know who is getting sick."

Wodka then talked about OSHA. "You have the right to be with that government inspector the moment he crosses the gate," he said, adding that the inspector was there for the workers' benefit, not for the company's. "You take that inspector around," Wodka advised. "I have seen too many times when we have filed complaints and our people have let the company lead the inspector around."

When Wodka had finished, a woman in the audience got up and said that, so far as she was concerned, women had not been seen or discussed as human beings at the conference. "They have been seen as reproducers," she declared. Shortly thereafter, Andrea Hricko brought the session to an end, saying that the health problems of women workers had been given virtually no attention. "What has become clear, particularly in this discussion, is that workers need to be informed," Ms. Hricko continued. "They need to know about the health effects of the chemicals they are working with." Ms. Hricko went on to say that medical scientists must present such information to the workers in language that workers can understand. "Workers need to know how to use OSHA, how to use grievance procedures, and how to use collective bargaining," Hricko added. "They need to know,

as Steve Wodka pointed out, how to get publicity if other methods fail." Hricko concluded by telling her listeners that "When women have the facts about the health hazards of their jobs, they will be able to fight for changes that will protect them, their husbands, their co-workers, and all of their future children."

Part Six

DISCRIMINATION AGAINST WOMEN WORKERS

--A Key Issue

"Yesterday, we talked pretty much about women as child-bearers; today we are going into the area of job placement discrimination," said Dr. David Wegman, Assistant Professor of Occupational Medicine at the Harvard School of Public Health, who opened the second day of the Conference on Women and the Workplace by introducing Dr. Shirley Conibear, of the University of Illinois School of Public Health. Dr. Conibear started out by saying that the conference was "grappling with critical questions of whether or not working women experience greater disease and disability than their male co-workers." She went on to point out that although women have traditionally been viewed by our society as physically weak, they moved into all types of jobs during World War II without apparent difficulty. "Another argument for placing women in a high-risk category is that they have quote 'special susceptibility' to certain toxic substances such as lead and benzene," Dr. Conibear continued, adding that there was very little scientific evidence to support this theory.

"My concern is that we not focus only on exposed women workers, but that we be equally concerned with the exposed men," Dr. Conibear told the conference. She went on to say, however, that the pregnant worker deserves special attention. "The fetus is being exposed to a host of toxic materials and possibly stressful situations," she declared. "There has been no systematic attempt to identify which chemicals cross the

placenta, or what their teratogenic potential is." Dr. Conibear concluded her talk by presenting an eminently practical approach to the problem: "Intensive epidemiology and toxicologic research must be started immediately to further define which substances are mutagenic, teratogenic, and carcinogenic for the fetus, and what occupational levels represent an acceptable social risk."

At this point, Dr. Don Chaffin, Professor and Director of Occupational Health and Safety at the University of Michigan, addressed himself to the issue of occupational hazards related to physical strengths. Dr. Chaffin told the conference that he and his colleagues had tested over 2000 men and women in eight different plants, and found that whether a worker is male or female has little to do with individual strength. Indeed, Dr. Chaffin's study showed that the incidence of low back pain was three times greater in people who were physically weak, regardless of sex. He recommended that people be matched up physically with their jobs on the basis of strength testing administered prior to job placement. "I believe that strength testing for placement purposes can have a significant effect in reducing the risk not only for women, but also for men," Dr. Chaffin concluded.

Dr. Chaffin was followed to the podium by Sunny K. Wofford, ^Hhealth and ^Ssafety ^Pproject ^Ccoordinator for the Association of Flight Attendants, who described some of the health problems being encountered by the 18,000 airline flight attendants who are employed by 19 major airlines in the United States today. According to Ms. Wofford, a preliminary health study conducted by the Association disclosed that cumulative

sleep deficiencies due to jet travel are a major complaint of these workers, most of whom, of course, are women. "The noise levels along with the pressurization lead to mental and physical fatigue," said Ms. Wofford, who added that the day of the flight attendant often begins at 6 A.M. and ends at 6 P.M., and sometimes consists of as many as a dozen landings and takeoffs. Ms. Wofford told the conference that a long-range study of the health experience of flight attendants was sorely needed in order to determine such questions as whether there are hazards in air travel for unborn children, and whether a flight attendant should continue ^{to} work after the second trimester of pregnancy.

As the session continued, it became more and more apparent that many of the health problems confronting women workers were not problems that could be described as uniquely female, but problems that occur because certain types of jobs are traditionally and predominantly filled by women. A good example of this was provided by Dr. Alan Palmer, of NIOSH, who conducted a study of occupational disease among cosmetologists in 1973 and 1974. According to Dr. Palmer, it had been postulated back in 1958 that resins in aerosol hairsprays might, when inhaled, be stored in the lung, causing a disease known as pulmonary thesaurosis. In order to investigate this theory, Dr. Palmer and his colleagues studied a group of 262 student cosmetologists, and a group of 213 graduate cosmetologists, all of whom lived and worked in Utah, and compared their health experience with that of a control group of 569 people of the same age, smoking habits, and regional background.

After administering a number of tests for respiratory function, Dr. Palmer and his co-workers found that the cosmetologists had a significantly increased incidence of bronchial problems. They also found evidence of reduced lung function, which grew progressively worse as their exposure to hairsprays continued. Indeed, abnormal lung findings were about one and a half times greater in the graduate cosmetologists than in the control group. "Cosmetologists working in small salons are considered to have increased prevalence of disease due to the general lack of ventilation," Dr. Palmer said. "In fact, small salons demonstrated higher environmental concentrations."

Dr. Kaye Kilburn, who is from the Department of Medicine of the University of Missouri Medical Center, then told the conference that after making a broad survey of the textile industry, he had concluded that there was no evidence to support the belief that women textile workers were more susceptible to occupational disease than men. Dr. Kilburn went on to say that typical health problems encountered by textile workers of both sexes are headaches caused by the tremendous noise levels in spinning and weaving rooms; a lung disease called byssinosis, which is characterized by chest tightness, shortness of breath and cough, and which is clearly attributable to the inhalation of cotton dust; mattressmakers' cough, which is believed to be caused by the inhalation of fungal spores in raw cotton; weaver's cough, which is caused by the inhalation of starches used to size material; and, most important of all, chronic bronchitis. Dr. Kilburn proceeded to show a number of slides describing various operations in cotton mills, and the occurrence of lung disease in male and female textile workers. After demon-

strating that the incidence of byssinosis rises much more steeply for smokers than for non-smokers, Dr. Kilburn said that there was "clear evidence that the most important difference between people employed in textiles was not sex or color, but whether they were current cigarette smokers or had ever smoked at all." He went on to say that there was a clear additive effect for byssinosis and bronchitis between cotton dust and smoking. "I think the evidence is strong that cotton dust is a health hazard," Dr. Kilburn told the conference. "However, we are still waiting for the adoption of a new cotton dust standard."

Following Dr. Kilburn's presentation, a paper on radiation exposure and protection was delivered by Dr. Vilma Hunt, who is an Associate Professor of Environmental Health at Pennsylvania State University. Dr. Hunt told the conference that "the evidence is quite clear from observation on both human and animal populations that genetic and developmental effects and several kinds of cancer can be produced by high doses of ionizing radiation." Dr. Hunt went on to say that the current guiding policy of the National Council on Radiation Protection and Measurements is that the lowest practicable radiation level should provide the basic concept for the establishment of radiation standards. "As a working philosophy, how does that apply to the fertile woman?" Dr. Hunt asked. "Although the larger proportion of fertile women who work in a radiation environment are hospital workers, more women are entering the nuclear industry, and we have new occupations appearing--for example, airline baggage inspection. You should

ask some of these young women sometime if anybody is looking at their badges." After telling the conference that "the need to minimize exposure of the embryo and fetus is paramount," Dr. Hunt said that a NIOSH study on hospital occupational health services showed a woeful lack of training programs for the control of radiation exposure.

"It is ironic that epidemiologic studies of the longevity, morbidity, and mortality of radiologists, usually excluding the few who were female, have been going on for 20 years, but that there is nary a one on X-ray technologists, or nurses dealing with radiation therapy," Dr. Hunt continued. After disclosing that estimates of the genetic risks of X-rays in human populations are still based on experimental animal data, Dr. Hunt said that the long-term effects of exposure to ionizing radiation should be thoroughly investigated.

The last speaker for the session on health risks associated with job placement patterns related to sex was by Dr. Meier Schneider, who is an industrial hygiene engineer with the Los Angeles City Health Department. Together with Dr. Hector P. Blejer, Dr. Schneider has made a study of health hazards related to the employment of women as dental assistants. "Approximately 125,000 non-military employees work as chairside dental assistants in this country, and most of these workers are young females in their late teens or early twenties," Dr. Schneider said at the outset. He went on to tell the conference that one of the main tasks of the chairside dental assistant is the repeated preparation of mercury-silver amalgam material for filling decayed teeth; that dentists in the U. S. use more than 200,000 pounds of liquid mercury

a year; and that this accounts for almost 50% of all the mercury metal used. "Knowledge of mercury toxicity to humans dates to ancient Greece," said Dr. Schneider, who went on to describe the harmful effects of mercury to the central nervous system, the gums, the kidneys, and the lungs.

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"Because inhalation of mercury vapor is well known for its effect on the central nervous system with subsequent marked alteration of behavior patterns, many dentists in California became concerned and asked the Occupational Health Program of the California State Health Department to evaluate the extent, mode, and level of mercury contamination in their offices," Dr. Schneider continued. When he and his colleagues proceeded to study some 303 people, including 177 women, who worked in 19 dental offices, they found that all of the offices were contaminated with mercury; that mercury levels in urine provided the best index of exposure testing; and that the mercury hazard was greatest for dental assistants who handle mercury, and next for dentists. "Close observation of procedures in the dental operatory revealed that the chairside dental assistant is momentarily but frequently subjected to contamination of mercury vapor several times in excess of the current OSHA standard," Dr. Schneider said. He added that although chairside dental assistants constitute an occupational group at greatly increased risk of developing chronic mercury poisoning, he knew of no epidemiological or clinical studies that had been made of them. "The Minamata tragedy vividly demonstrated the teratogenic nature of organic mercury," Dr. Schneider concluded. "Inasmuch as transplacental migration of organic and inorganic mercury occurs in the pregnant woman who

is exposed to and absorbs this element, appropriate studies of the offspring of female dental assistants, in particular, as well as other dental personnel, appear warranted."

The first discussion leader of the session on health risks and job placement patterns was Dr. Janette Sherman, a physician from Detroit, who told the conference that during the course of her practice, she had found that women, by and large, are vulnerable to the same occupational diseases as men. Dr. Sherman went on to say that she was appalled to see women smoking at the conference. "I will have to say to you that if you wish to be taken seriously about wanting to clean up the workplace, you had better stop smoking, because the two are incompatible," she declared. "In every single case I have ever testified on, the smoking history was brought out, and if a person did smoke it was used against them as far as making any kind of occupational lung claim."

Dr. Sherman went on to tell the conference that company physicians do not come under the usual malpractice regulations, and cannot be sued, "something that clearly needs to be attended to as far as your contract talks go." She also suggested that her listeners become familiar with the chemicals they use at home. "Your Saranwrap, your pesticides, the hairsprays, deoderants, et cetera, all of them contain chemicals," she said. "I challenge you to go home and make a list of all the chemicals and food products you are using, and to try and find out what chemicals these products contain. You are going to have quite a chore."

Dr. Sherman added that industrial workers would have even greater difficulty in finding out what chemicals they work with. "I think this is probably top on the list of bargaining demands that must be made," she declared. Dr. Sherman continued by telling her listeners that "we are indeed our sisters' keepers, and once we get the women liberated, we can then work on the men." In conclusion, she told the conference that "I think we have to err on the side of conservatism and when there is a question of genetic risk and carcinogenesis, I believe we have to get those chemicals out of the workplace, out of the reach of the consumer, and away from people."

The second discussion leader was Dr. Marcus B. Bond, ^C corporate medical director of the American Telephone & Telegraph Company, who began by complimenting the authors of the papers that had been presented at the session. Dr. Bond went on to say that it was the policy of his company to tell its employees anything that was found during a physical examination. Dr. Bond said that during the past few years A T & T had been placing more and more women in skilled and semi-skilled outside craft jobs such as telephone installing and repairing and cable splicing, but that many women had failed to pass the initial training period for this kind of work. He added that women workers in his company have an increased rate of on-job injuries. "It isn't a real high rate as compared with some industries," Dr. Bond concluded, "but it is high for us, and we are very concerned. We are in the process of analyzing it in order to take greater precautions in selection and placement, while at the same time providing opportunities as much as we can."

During the general discussion and comment period, people in the audience seemed especially eager to make themselves heard on the morning's topic. Dr. Jeanne Stellman, of the University of Pennsylvania, and formerly an assistant on health problems to the president of the Oil, Chemical & Atomic Workers Union, told the conference that "Yesterday, our entire perspective was devoted to considering women as vessels for future generations, and today we have itemized women into particular professions." Dr. Stellman went on to point out that the vast majority of women in the workplace have already had their children, and that the occupational health problems of women are no different from those encountered by men except when women are pregnant. "Women are segregated," Dr. Stellman declared. "They are discriminated against, and they face dead-end jobs in dead-end careers." She suggested that society start providing child-care facilities so that women can fulfill their social obligations as mothers and childbearers. "That is what we should talk about, not simply whether a few isolated substances will pass the placenta," Dr. Stellman said.

Another interesting comment came from Dr. Kenneth Bridgord, of NIOSH, who pointed out that a potential health hazard for flight attendants comes ^{from} of the benzopyrene levels that are found in aircraft as a result of cigarette smoking. Dr. Bridgord said that these levels were very high, and suggested that there might be an increased risk of lung cancer among flight attendants because of them.

In response to questions from the floor, Dr. Kilburn said that in addition to noise and dust, the use of chemicals in the textile industry presented a grave health problem. "Remember that the workers who are putting formaldehyde in permapress are about five times as likely

to get chronic bronchitis as those who are making the cotton fiber or weaving it," he said. Dr. Kilburn also said that recent evidence from Spain suggests that lung disease can result from the inhalation of nylon and orlon dust, and recommended that health studies be made of workers in this area of the textile industry.

The session on job placement discrimination ended on a rather appropriate note, when a woman in the audience told the conference that she had heard no mention of the largest occupational group of women in the country. "Although we have the cleanest houses and clothes in the world, our housewives probably have lungs full of oven cleaner, bathroom cleaner, and detergent," she said. "I think this is something we ought to be looking at."

Part Seven

THE LEAD PROBLEM: Not for Women Only

The session on lead and women promised to be a high point of the conference for several reasons. To begin with, many women felt that the recommendation of the Lead Industries Association to exclude women of child-bearing age from working in lead battery plants and lead smelting facilities was discriminatory. Still others were outraged that at least one woman working in a battery plant had had herself sterilized in order to keep her job. Indeed, women workers at the conference tended to view the issue of lead as a symbol of the unfair treatment that has generally been accorded to women in the workplace.

Dr. Kenneth Bridbord, Of NIOSH, opened the session with a general review of lead toxicity. He reminded the audience that the hazards of lead had been known for nearly 2000 years, and that excess exposure to lead on the part of the ruling classes may even have been a contributing factor in the fall of the Roman Empire. Then he told the conference that lead absorbed into the body comes primarily from the ambient air and from the diet. "In urban areas, approximately one-third of the lead absorbed into the body of an adult among the general population with no occupational exposure comes from inhalation of ambient air contaminated with lead derived primarily from motor vehicle emissions," Dr. Bridbord said, adding that for

this reason, "people exposed to lead on the job are in double jeopardy."

Dr. Bridbord went on to say that lead poses a hazard to the central nervous system, to the kidneys, and to the blood forming systems of the human body. "If exposure to lead is sufficiently great, the central nervous system may be acutely and severely damaged, resulting at times in coma, convulsions, and even death," he pointed out. Dr. Bridbord said that lead can also wreak havoc on the peripheral nervous system, causing damage to the muscles of the forearm--a condition known as wristdrop--and that another common manifestation of lead poisoning ⁱⁿ ~~is~~ workers is severe abdominal pain, which is a condition known as lead colic.

Dr. Bridbord told the conference that "If workers exposed to lead on the job are at double jeopardy, then women workers of child-bearing age must be considered to be at triple risk," since lead adversely affects the fetus. According to Dr. Bridbord, women who reside near heavily travelled roads, or who spend a lot of time driving in heavy traffic, may be absorbing a greater-than-average amount of lead into their bodies. "This means that women of childbearing age may already be entering the lead industry with blood lead levels close to or above the level of concern with respect to the fetus," he concluded. "Any recommended standard for lead, either in the general environment or in the workplace, should consider the special susceptibility of women of childbearing age and particularly the fetus to lead."

Dr. Bridbord was followed to the podium by Dr. Peter Infante,

also of NIOSH, who proceeded to go to the heart of what was troubling women workers about the issue of lead. "We have heard about the effects of lead on women as women," Dr. Infante declared. "We have heard about the effects of lead on women as units of reproduction. As a man, I think it is high time we look at the effects of lead on the reproductive systems of males." Dr. Infante went on to say that because lead is known to cause miscarriages, women are either being transferred out of high lead exposure areas, or are being required to present medical evidence that they cannot bear children. According to Dr. Infante, the trouble with this approach is that it ignores the toxic effects of lead upon the reproductive systems of men, which, in turn, gives industry an excuse for not instituting engineering controls that would reduce lead exposure for all workers.

Dr. Infante proceeded to tell the conference that it had been known for more than sixty years that men exposed to lead as house painters fathered a far greater-than-average number of stillborn children. He added that a recent study of men working at a lead storage battery plant showed that even slightly increased lead absorption caused damage to sperm cells. "In light of these findings, must we now also transfer male employees from high lead exposure areas, or require proof of their inability to reproduce?" he asked.

After Drs. Bridbord and Infante had outlined the biological consequences of lead absorption, industry's position on the employment of women in the lead trades was presented by Dr. Sidney Lerner, who is Assistant Professor of Environmental Health at the University of Cincinnati School of Medicine. To begin with, Dr. Lerner said that

in addition to his academic position, he was a consultant to industries using inorganic lead, but that his participation in the conference was as an independent physician. "Pregnancy and the potential for pregnancy should always be considered when evaluating a woman applicant," Dr. Lerner stated flatly. He ~~came~~^{went} on to say that the proposed government standard for occupational exposure to lead states that the blood lead level in a mother might harm the fetus without producing any clinical symptoms in the mother. "There is good evidence that lead absorbed into the bloodstream does cross the placenta and gets into the fetus," he said. "One can speculate that if fetal damage were to occur from elevated levels in the mother, the maximal risk may be in the first trimester when the condition of pregnancy may not be known or may be concealed."

Dr. Lerner told the conference that in March of 1975 the United States Public Health Service had recommended that blood lead levels in children be kept below 30 micrograms per 100 grams of blood. "The proposed occupational standard could permit fetal blood levels of twice this amount, a clearly unacceptable circumstance," Dr. Lerner declared. After pointing out that women workers may have good reason to try to conceal pregnancy, Dr. Lerner said that medical examination for pregnancy should be required in the lead industry. "Do we not have a responsibility to prevent the possibility of a fetus being exposed to concentrations of lead which are acceptable to the adult mother, but which may increase the risk of material impairment to the fetus?" Dr. Lerner asked. He then answered the question by saying that "it has been my

recommendation to persons responsible for the health of lead workers that females, who may be fertile, or gravid, or lactating, not be employed in areas where they will be ^Ssubject to increased lead exposure."

A labor viewpoint and rebuttal to Dr. Lerner's position was delivered by Claudia Prieve, an industrial hygienist with the United Steelworkers of America. Ms. Prieve observed to begin with that lead is by no means unique in terms of its consequences in women workers, and that other substances, such as vinyl chloride and some anesthetic gases, present similar dilemmas. She went on to point out that women coke oven workers were being heavily exposed to many different harmful compounds, including benzopyrene, which has been demonstrated to be transplacentally carcinogenic in test animals.

"The upcoming lead hearings will probably be the first time that the issue of women in the workplace has been dealt with in any ^{significant} ~~significant~~ depth by OSHA," Ms. Prieve said, adding that more and more companies were excluding women from areas where lead is handled. "If the highest job categories in a plant are in the lead areas and women can no longer work there, shouldn't equal job opportunities be provided for them in areas where they can work?" she asked. "Why shouldn't men, who are left to work in the higher lead areas of the plant, also sue for discrimination, particularly in light of what we know of the effects of lead in spermatogenesis?"

Ms. Prieve went on to say that in the proposed standard for occupational exposure to lead, OSHA was reserving the right to mandate an employee's removal from the job. "If the Secretary of Labor has

that authority, then by parity of reasoning he must have the authority to protect that employee from any adverse economic effects resulting from the removal he mandated," she declared. "We ask only that OSHA recognize the full impact of their regulations from a moral point of view." At this point, Ms. Prieve made a telling analogy in support of her argument by referring to the problem of anesthetic gases. "It costs very little to install a scavenging device in an operating room," she said, "but I wonder what would happen if, instead of a few hundred dollars, it cost \$100,000 or even a million dollars to correct the problem. I have a feeling no one would seriously suggest that we remove all women of childbearing age from the operating room. Operating room nurses and anesthetists are too well ingrained in our system to give them up so easily. After all, who would hand the surgeon his scalpel or wipe ^{his} perspiring brow?"

Later in her talk, Ms. Prieve pointed out that most women workers cannot wear industrial respirators because they have been designed to fit the standard-sized man. "I bring up the subject of respirators for two reasons," she said. "First, because it is an example of how our society designs for the standard man. I find it interesting, for example, that during the World War, the Germans designed respirators to fit horses and dogs, and we can't seem to design them to fit women...The second reason I bring up respirators is that it further illustrates the kind of trap women are placed in. Perhaps many women could stand the smelters and keep their jobs if they could wear respirators adequate for the job, but they have a difficult time keeping their blood lead levels low when there is no respirator that fits them."

At this point, the Department of Labor's position on the employment of women in the lead industry was delivered by Dr. Morton Corn, who is Assistant Secretary of Labor for Occupational Safety and Health. Dr. Corn told the conference that at the time his department issued its proposed standard on lead exposure, there was insufficient data for setting limits to protect pregnant women. "We are aware that there are complicating aspects associated with any policy for a susceptible group in the work environment," Dr. Corn said. "Initially, let me say that the most desirable solution is to deal with all exposed workers at the level which is safe for the susceptible group. However, we do not know at this time if it is possible to treat both sexes equally by engineering the work environment to a sufficiently low level of lead exposure. Incidentally, there is a finite level of exposure which can be engineered. And it is not zero."

Dr. Corn went on to tell his listeners that OSHA had reviewed the occupational health situation in 800 or so lead facilities across the nation, after learning that workers in two lead plants were being exposed to concentrations of lead that were 35 times greater than the present standard allows. "What I am saying is that we are a very, very long way in this country from the existing standard," Dr. Corn admitted.

Following Dr. Corn's presentation, discussion about the lead problem was initiated by ^{Sue}Susan Nelson, who is a ^LLegislative ^AAssociate with the House Subcommittee on Manpower, Compensation, and Health and Safety. "In view of the fact that much public attention has focussed on lead, the lead standard may become a landmark issue for OSHA and for the workers of this nation," Ms. Nelson began. She went on to wonder

aloud about the present and pending policy of excluding women from the lead trades. "If it were determined that male workers of child-bearing age were the high risk group because lead causes greater damage to the male reproductive capacity than to women, would there really be any question in the minds of policy formulators, industry, or even in the courts as to where a permissible exposure limit should be set?" she asked. Ms. Nelson said that in controversial cases the Supreme Court has ruled that the fetus is part of the woman, and she gave the opinion that considering the effects of a substance upon the reproductive process was clearly appropriate when setting occupational health standards.

The second person to discuss the issue of women and lead was Mr. Wayne Brooks, ^Ddirector of Occupational Safety and Health for the Organization Resources Counselors, Inc., of Washington, D.C. Mr. Brooks declared that "we are striking right at the basic assumptions of our economic structure, our social structure, our labor agreements, and our scientific research." He concluded that the problems raised at the conference were far too difficult to be easily resolved, but that people coming together under the auspices of an interdisciplinary group such as the Society for Occupational and Environmental Health might provide a start.

When Mr. Brooks had finished his remarks, comments were solicited from the floor of the conference, and Mollie Jay Coe, a Medical student at Johns Hopkins, who is working with the OCAW, stated that the proposed standard on lead sets a dangerous precedent of discrimination against women. "It directs that each employer shall pro-

vide a medical examination which includes a pregnancy test, where appropriate," she said. "A woman found to be pregnant could then be denied a job or transferred out at a cut in wages and seniority. So women who are not pregnant and all men are not protected, and the pregnant woman is seriously penalized economically for her decision to bear a child."

Shortly thereafter, Clara Schiffer of HEW asked Dr. Lerner to tell the conference what the lead industry is doing by way of developing technology to clean up contamination in the workplace. Dr. Lerner replied as follows: "I can say it is better than it used to be. Maybe that's not saying a lot. I don't know how much better because I don't know how bad it was. But I know that today there is lots of room for improvement."

Anthony Mazzocchi, legislative director of the OCAW, reminded the audience that occupational health was essentially a political and economic subject, and that it should be dealt with as such. Mazzocchi went on to say that in order to increase productivity in the workplace, large numbers of workers have been removed from maintenance tasks, which has increased unsafe working conditions. "We had refineries some years ago that could produce 150,000 barrels a day with 3,000 men," he said. "That same refinery now produces 500,000 barrels a day with 900 men. Granted, there has been some improved technology, but essentially it is because the refinery is kept on stream until it breaks down or blows up, which refineries are doing with increasing frequency." Later in his remarks, Mazzocchi told the conference that workers sacrifice years of their lives in order to keep industry opera-

ting. "The argument essentially is whether workers should withhold this subsidy to industry," he declared.

The fact that some women were far from pleased with the way the conference was being conducted came to light toward the end of the discussion session, when Catherine Johnson from the University of California said that she and twenty-three of her colleagues wished to state publicly that they did not view women's occupational health as strictly a medical and scientific problem. Ms. Johnson was seconded in these sentiments by Naomi Fatt of New York, who said that the conference had ignored the problems caused by sex oppression on the part of male bosses. "We also object to the fact that the discussion was primarily ⁱⁿ technical terms," she continued. "It is a perfect example of scientists who are unable or unwilling to speak to the people."

Replying to such criticism, Clara Schiffer, a co-chairperson of the conference, said she felt that much of it was valid. "I think the criticism that there was too much technical language without an explanation was warranted," she went on. "I think we cannot have science watered down to a third grade level. On the other hand, if a scientist can't explain himself in language that all of us can understand, then we are not in a position to put the information to use."

At this point, Maggie Wolner, who is with Medicine for People, in Montreal, said that one way to improve communication would be to hold a conference in which workers and the people talk to scientists. "I think it would be very important to give working women the opportunity to talk about the problems they encounter in the workplace, and to have scientists listen clearly to what these problems are so that

they can direct their research to them."

Frank Wallick, of the United Auto Workers, applauded the people who raised the question of how best to communicate scientific information. He went on to say, however, that critics of the Society for Occupational and Environmental Health should understand that the society had influence^d the^d Coalition of Labor Union Women to set up its task force on occupational health. Wallick then enunciated the fervent hope of practically everyone who attended the Conference on Women and the Workplace.

"I think that the sensitivity of the women's movement may ignited^d the occupational health movement as it has never been ignited before," he declared.

Part Eight

A TRIBUTE TO DR. HARRIET HARDY

On the evening of June 18th, the Society for Occupational and Environmental Health held a dinner meeting to present its Second SOEH Award to Dr. Harriet Hardy for her pioneering efforts in the identification and eradication of occupational disease. In recapitulating Dr. Hardy's brilliant career, Dr. Joseph V. Wagoner, President-Elect of the Society, told the audience that during the 1930's and early 1940's, Dr. Hardy directed the Occupational Disease Clinic at the Massachusetts General Hospital, and that after World War Two, she spent a year studying the hazards of radiation at the Los Alamos Scientific Laboratory of the Atomic Energy Commission. Dr. Hardy was an instructor of industrial hygiene at the Harvard School of Public Health; Assistant Medical Director of Occupational Medical Service at the Massachusetts Institute of Technology; and one of the first women to hold a full professorship at the Harvard Medical School. In 1946, her investigations led to the identification of the chronic respiratory disease caused by beryllium used in the manufacture of fluorescent lamps, and through her efforts the beryllium case registry was established. A disciple of the late Dr. Alice Hamilton, Dr. Hardy and her famous mentor co-authored the classic textbook, "Industrial Toxicology," in 1949. The award presented to Dr. Hardy was a scroll

inscribed with the following words:

"For keeping the light of Alice Hamilton,
for her contribution to American Medicine
as a scientist and a teacher, for her integrity and devotion to easing the plight
of diseased workers, the Society for Occupational and Environmental Health makes its
Second Award to Harriet L. Hardy."

In accepting the award, Dr. Hardy told the audience that she had concluded rather early in her career that not enough was known about the onset of disease, and had decided to specialize in clinical preventive medicine. "I soon found myself working at the Massachusetts Division of Occupational Hygiene in the Department of Labor, just at the time of the epidemic of disease in the Massachusetts fluorescent lamp industry workers, and I have never had a dull day since," she said. Dr. Hardy went on to tell the gathering that because government agencies are influenced by industry, they often fail to advise workers of occupational hazards. "Government agencies and industry cannot ignore the powerful counteraction to the evil consequences of the industrial revolution," she declared. Dr. Hardy concluded her talk by making a plea for ^{humane} ~~human~~ epidemiology that will determine the correct correlation between exposure to various toxic substances and the onset of disease. "I use the word 'plea' because you and I will live to see and must insist that cell cultures rather than small animals or human volunteers will become the ideal material for studying the hazards posed by various chemicals," Dr. Hardy said.

Part Nine

WOMEN FOR A SAFE AND FUTURE WORKPLACE

On the final day of the conference, a wrap-up session summarized some of the chief issues that had been raised, and various assessments were made of the problems and pitfalls that would have to be surmounted in order to achieve a safe workplace for women. The first speaker was Dr. Julia Makarushka, associate director of the Health Studies Program at Syracuse University, who gave an analysis of the workers' compensation system and the long-term consequences of industrial injury for women. According to Dr. Makarushka, two studies of seriously injured male and female workers indicate that women do not receive workers' compensation in proportion to their representation in the labor force. Dr. Makarushka said that this situation exists not because women incur fewer injuries than men but because they enjoy less coverage in workers' compensation programs.

Dr. Leon Warshaw, Vice President and Corporate Medical Director of the Equitable Life Assurance Society of the United States, then told the conference about a new project designed to protect the immediate and long-term health of the pregnant woman and her child. According to Dr. Warshaw, "obstetricians and those who care for the

pregnant woman are ignorant of the demands and the potential hazards implicit in many types of work, while industrial physicians have lost, or, indeed, never acquired the expertise to guide women safely through pregnancy and delivery." Dr. Warshaw then said that the American College of Gynecology and Obstetrics--an organization of more than 18,000 practicing obstetricians--had agreed to staff and direct a program that would set forth guidelines designed to assist physicians in taking proper care of women workers during pregnancy. "If accepted, these guidelines will set a standard of practice," Dr. Warshaw said. "In other words, they will force the practicing physician to take an interest in what his patient does on the job, which is something those of us in occupational medicine have been striving for generations to accomplish."

Following Dr. Warshaw's proposal, a three-member panel discussed women's responsibilities to society as seen by women. With Andrea Hricko leading off, the subject turned once again to a major theme of the conference--discrimination. "Although more and more women are working, they still earn less than men," Ms. Hricko declared. "In 1974, the median earnings of women were under \$7000 compared to earnings of over \$12,000 for men." Ms. Hricko went on to tell the conference that many employers hire women only if they can no longer bear children. "Many refuse to accept women in apprenticeship programs, thus cutting off women's access to non-traditional jobs that are exclusively male," she said. "Some employers fire women when they become pregnant. Others take away a woman's seniority when she returns to work after having a child."

According to Ms. Hricko, the hazards of occupations in which women are predominantly employed have not been adequately studied. She proceeded to give three examples. "There are over ten million women clerical workers in this country and most of them are currently unorganized," she said, adding that clerical workers are often exposed to excessive noise, fumes from copy and duplicating machines, and many chemicals. "Over 100,000 women work in drycleaning establishments and in laundries," she continued, pointing out that these workers often launder industrial clothing contaminated with asbestos and other cancer-causing substances, and that they are exposed to a variety of dangerous solvents. Ms. Hricko then described the situation existing for the 271,000 electronics workers in the country. "Over 75% of them are women," she declared. "Many of them are nonwhite. A high percentage do not speak English. They work with a wide variety of organic solvents, including chloroform and trichloroethylene, which have already been demonstrated to cause cancer in animals." Ms. Hricko concluded by telling the conference that society has an obligation to provide safe and healthful jobs to all workers who need and want them. "This obligation affects the well-being of women, men, children and society as a whole," she said. "Until the obligation is met, women workers must keep struggling to change an inequitable system that provides them with less than equal protection under the law."

At this point, Jeanne Culler of the Amalgamated Clothing and Textile Workers Union of America, continued the attack against discrimination by telling the audience that she was tired of the phrase,

"You've come a long way, baby," because she felt it was misleading. "The duplicity of our society's attitude towards pregnant women really demonstrates how far we have to go," she declared. Ms. Culler went on to say that the pregnant woman is treated as a second-class citizen in terms of health coverage and health services, as well as in the amount she has to pay for them, and that her difficulties are compounded by the fact that just when she needs financial security the most, she is often threatened with the loss of her job. "I think one of this country's priorities ought to be providing health care and health protection for all its citizens regardless of their race, regardless of their sex and age, and regardless of whether they are fertile, gravid, or lactating," ^{she} said.

The next panelist to criticize the discrimination taking place against women in the workplace was Carolyn Bell, an industrial hygienist with the United Rubber Workers. "I, like many women present at this conference, am fearful of what the repercussions will be towards our economic and social stability if we, as women, allow ourselves to be treated separately," she told the audience. Ms. Bell went on to say that women of childbearing age should ^{only} be exposed to levels of hazardous chemicals that have been determined to be safe. "If such levels cannot be achieved, and if women must be removed or transferred, then let us be removed or transferred without economic penalty," she insisted. "This transfer or removal without penalty should be guaranteed by the Federal Government."

Ms. Bell called upon women to assume a larger and more

influential role in bringing about a safer workplace. "Women must become more visible on national standards advisory committees such as the National Advisory Committee on Occupational Safety and Health, and the advisory committees to the OSHA standards," she said. "We need more women participating in local union activities such as joint labor-management safety committees and local union offices." Quoting statistics from Andrea Hricko's book, Ms. Bell pointed out that, according to a survey conducted in 1972, of the 24 unions with ~~more~~ than 50,000 members, only six of the 187 national officials were women. "I say to you that society must reassess its priorities," she told the conference. "If this country can put a man on the moon, then I refuse to believe that we cannot plug up a few leaks and holes and install some control techniques that would protect the workers here on earth. We want standards to protect us. We want them enforced. And we want them now!"

When the audience was called upon for comment, Eric Frumin of the Amalgamated Clothing and Textile Workers said he was dismayed that there were no representatives from Europe or the Soviet Union at the conference. According to Frumin, occupational safety and health policies of some European countries are superior to our own. He also pointed out that women workers in some European countries do not face the same type of employment discrimination that exists in the United States. In conclusion, he called upon OSHA and NIOSH to translate more of the foreign literature on occupational disease, in order to better protect the American worker.

At this point, Dr. Andre Lebrun, ^Mmedical ^Ddirector of the FMC Corporation, told the conference that he felt many people were equating protection of the pregnant woman with protection of the fetus. "These are two completely different subjects," Dr. Lebrun declared. "The fetus, because of its much greater susceptibility to many agents, and also because of an ignorance of the possible effect of new agents which are brought into the workplace daily, needs a much higher quality type of protection. I have heard suggestions here that levels should be set to protect the fetus. Although I wholeheartedly support a general concept of zero exposure, I would like to see whether it is technologically, economically, or socially feasible."

When Dr. Lebrun had finished his statement, Andrea Hricko asked him what information he gives to male workers who are exposed to carbon disulfide at the FMC plant in Nitro, West Virginia, concerning the adverse effect of the chemical on sperm cells.

"I think you have missed my point," Dr. Lebrun replied. "My point was directed toward the fetus." Dr. Lebrun went on to say that "if we are talking of the risk to an adult individual, I have to tell the employee, male or female, what risks are involved in working in a particular situation. Then he or she can make a choice. The fetus has no choice."

"So you do recognize that before conception something can happen to the male that can result in a birth defect in offspring?" Ms. Hricko asked.

"I said from the very beginning that we agree on that,"

Dr. Lebrun answered.

"I am glad you recognize it," said Ms. Hricko. "Thank you."

Shortly after the exchange between Ms. Hricko and Dr. Lebrun, a panel of three lawyers discussed the legal requirements and implications of a safe workplace. The first speaker was Peter Robertson, ^Ddirector of the Office of Federal Liaison at the Equal Employment Opportunity Commission. Mr. Robertson began by reminding his audience that in 1972 Congress gave EEOC the power to go into court and sue in order to eliminate discrimination. He went on to explain that at the present time the employer must prove that a discriminatory practice is a business necessity, either by being essential for the safe and efficient operation of the business, or because there is no viable alternative. As for discriminatory practices arising from considerations of occupational health hazards, Mr. Robertson stated his belief that if an employer has options but selects the one that excludes women, "I think he is going to have a very strong burden of proof to show why he could not use the other option."

The next panelist was Portia Hamlar, an attorney with the legal department of the Chrysler Corporation, who told the conference that she had had considerable experience in OSHA litigation and in EEOC proceedings. "Regulation by these two government agencies presents a dilemma frequently experienced by industry, that of conflicting governmental objectives," Ms. Hamlar declared. "However,

the dilemma presented by the revelation of women's occupational health problems is new, basically unexplored, devoid of extensive and conclusive scientific knowledge to aid its direction, and generally uninterpreted by various administrative agencies and the courts."

Ms. Hamlar went on to say that this dilemma will require the government to spend massive amounts of money for research concerning occupational health hazards for women and unborn children, in order to develop the valid and conclusive data called for by the Occupational Safety and Health Act. "Most OSHA exposure limits for toxic substances were not established with consideration of protection for women and fetuses, and many standards are based upon inconclusive scientific data," she said. "Consequently, modification of some standards may be required during the interim period of research." Ms. Hamlar told the conference that OSHA will bear a heavy legal burden of proof to sustain new or modified standards for the protection of women and unborn children. "Moreover, the substantial evidence test will be applied so as to provide a reasonable approach to the ~~LETT~~ dilemma of the employer and the employee during the interim research period," she continued. Ms. Hamlar said that it is reasonable to establish standards and exposure levels that will protect women of childbearing capacity, pregnant women, and unborn children. "It is reasonable to require OSHA standards to distinguish between hazards which affect only women of childbearing capacity and pregnant women, and hazards posing damage to male and female employees due to the possibility of genetic damage," she declared. According to Ms. Hamlar, it is also reasonable to require female employees to inform their employers of childbearing capacity or pregnancy. She called for EEOC, OSHA, and

industry to develop mutually agreeable guidelines for the protection of pregnant women and unborn children, and to define what circumstances do and do not constitute sex discrimination. "It would be more sensible, safer, and reasonable to have joint guidelines developed rather than to leave the matter totally to case-by-case decisions by the appellate courts," she warned, adding that in the final analysis the courts would balance low exposure limits for toxic substances against the possibility of massive unemployment and deprivation of products essential to society. "Let us come together sensibly," she concluded.

The final panelist in the session on legal implications was Anne Trebilcock, assistant general counsel for the United Auto Workers International Union. Ms. Trebilcock started out by discussing General Motors' plan to exclude women from working in lead battery plants. "We have come to a sad state in this country when a woman must choose between her childbearing capacity and her job," she said. Ms. Trebilcock went on to tell the conference that Vice President Odessa Komer of the UAW has been instrumental in alerting the union to the lead problem and its implications for women's job rights. "She feels the lead question is being used to discriminate against women," Ms. Trebilcock continued. "As she says, the mother of the fetus needs to eat. She also feels that the answer to the problem is fairly obvious. The plants should be cleaned up so that we can protect everyone's health. That health includes the reproductive health of both male and female workers."

Ms. Trebilcock told the conference that since this goal could

not be achieved immediately, each employee should be informed of the danger to his or her reproductive capacity. "Then, once the employee is informed, he or she should be free to make a voluntary temporary transfer to a job without lead exposure," she continued. "That transfer must not penalize the worker in any way. It must be at the same rate of pay. It must be with the same fringe benefits and other contractual protection that the worker had at the former permanent job. And, finally, the worker must have complete rights to return to the former job once the child is born. This solution comes the closest to any I have seen of meeting all the legal and other concerns posed by this problem."

Ms. Trebilcock went on to remind the conference that in the original OSHA legislation there was no mention of economic feasibility. "Employers have pushed this to the courts and unfortunately the courts have adopted it," she said. According to Ms. Trebilcock, employers want to exclude women workers from hazardous jobs because they fear lawsuits by women whose reproductive capacity has been damaged, as well as lawsuits by offspring who have been damaged while in the fetal state. In conclusion, she said that if employers were really concerned about the health of their workers, they would clean up their plants "instead of using the lead issue as an excuse to perpetuate illegal discrimination against women."

Following formal discussion of the legal issues, there was comment from the audience. Jeffrey Berger, who works for the Solicitor's Office of OSHA, pointed out that the administration is understaffed and underfunded. He also told the conference that the Court of

Appeals had instructed OSHA to take technological and economic feasibility into account during the standard-making process.

In response to a question about third party lawsuits, Anne Trebilcock said that although state worker's compensation laws usually prevent a worker from suing his employer for occupational injury, third party suits presented a creative alternative. "Asbestos workers who suffered serious health effects in Texas have sued the supplier of the asbestos," she explained. "In other words, they sued the company that provided asbestos to the employer on the grounds that it was an inherently dangerous substance, and that there was a duty to warn the employees about the hazard." Ms. Trebilcock went on to point out that suits had also been filed against company doctors for medical malpractice on the grounds that they had failed to warn workers that their health was being damaged by toxic substances.

Later in the discussion period, Matt Amberg of the International Union of Electrical, Radio and Machine Workers, one-third of whose members are women, told the conference that the Solicitor's Office of the Department of Labor was in effect telling workers that they must barter pay increases for health and safety. "All of a sudden we are being asked to share the economic burden of correcting hazardous conditions by trading off necessary wage conditions," Amberg declared. "I think that the Office of the Solicitor--and I have been nurturing this suspicion for a long time--has probably been the greatest stumbling block in the implementation of the 1970 Occupational Safety and Health Act." Amberg went on to suggest that

the Department of Labor get about the real business of issuing occupational health standards and enforcing them.

Toward the end of the session, Jeanne Reilly from the Professional and Technical Engineers Union asked Portia Hamlar what justification there was for a corporate policy which says, in effect, "that hardware is an asset, but that the worker is expendable."

Ms. Hamlar replied that she did not believe industry considers its workers expendable. "I think we are going to have to be a little more realistic in assessing this problem," she continued. "I feel that the day is coming when the pregnant employee will be considered a temporarily disabled employee and possibly will be able to recoup the insurance benefits that go along with that classification."

At this point, Dr. Eula Bingham brought the conference to a close by saying that from what she had seen and heard many occupational problems were entangled with discrimination. "That message has come across loud and clear to me," she declared. "I hope the appropriate people in government have heard that message. I think they have not heard the last of it."

Part Ten

SOME EMINENTLY QUOTABLE QUOTES FROM THE CONFERENCE

"We already have repressive hiring practices, and we have to face up to what is going on. Let's talk about it in public."

--Dr. Eula Bingham, conference
co-chairperson

"The Occupational Safety and Health Act clearly guarantees every working man and woman in the nation a safe and healthful workplace. Nowhere in the Act is there any distinction made between the sexes in terms of working conditions."

--Sylvia Krekel, OCAW

"When the issue is the hazard to the reproductive systems of both men and women, we must address ourselves to the setting of occupational health standards that take into account research concerning the impaired ability of either sex to produce healthy children."

--Peggy Taylor, staff member, U.S.
Senate Subcommittee on Labor

"When women have the facts about the health hazards of their jobs, they will be able to fight for changes that will protect them, their husbands, their co-workers, and all of their future children."

--Andrea Hricko, Labor Occupational
Health Program, University of
California

"It is ironic that epidemiologic studies of the longevity, morbidity, and mortality of radiologists, usually excluding the few who were female, have been going on for 20 years, but that there is nary a one on X-ray technologists, or nurses dealing with radiation therapy."

--Dr. Vilma Hunt, Pennsylvania
State University

"I challenge you to go home and make a list of all the chemicals and food products you are using, and to try and find out what chemicals these products contain. You are going to have quite a chore."

--Dr. Janette Sherman, Detroit

"Women are segregated. They are discriminated against, and they face dead-end jobs in dead-end careers."

--Dr. Jeanne Stellman, University
of Pennsylvania

"Although we have the cleanest houses and clothes in the world, our housewives probably have lungs full of oven cleaner, bathroom cleaner, and detergent."

--A woman in the audience

"I find it interesting that during the World War, the Germans designed respirators to fit horses and dogs, and we can't seem to design them to fit women."

--Claudia Prieve, United Steelworkers
of America

"Government agencies and industry cannot ignore the powerful counteraction to the evil consequences of the industrial revolution."

--Dr. Harriet L. Hardy
Harvard Medical School

"If this country can put a man on the moon, then I refuse to believe that we cannot plug up a few leaks and holes and install some control technology that would protect the workers here on earth."

--Carolyn Bell, United Rubber
Workers

"I get tired of hearing the phrase, 'You've come a long way, baby'...The duplicity of our society's attitude towards pregnant women demonstrates how far we have to go."

--Jeanne Culler, Amalgamated
Clothing and Textile Workers
Union of America

"I feel that the day is coming when the pregnant employee will be considered a temporarily disabled employee and possibly will be able to recoup the insurance benefits that go along with that classification. We are not at that stage yet, but I think it is coming."

--Portia Hamlar, attorney with the
legal department of the Chrysler
Corporation

"We have come to a sad state in this country when a woman must choose between her childbearing capacity and her job."

--Anne Trebilcock, United Auto
Workers International Union

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