

# HIGHTECH HAZARDS

*An Organizing Packet*

## Reproductive Risks

BY DIANA HEMBREE

Dr. Shanna Swan and Dr. Linda Rudolph, both epidemiologists, have joined in what is for them, says Rudolph, "a natural collaboration." They are charting reproductive hazards in the microelectronics industry. In a study that appears in a recently published occupational medicine series (published by Hanley & Belfus), the two California scientists report on animal tests and studies of workers in other industries that link toxic chemicals used in microelectronics to birth defects, miscarriages, and other reproductive problems.

Swan uses computers at the California Department of Health Services in Berkeley to track patterns of disease in various populations. Rudolph spent four years as a physician with the Oil, Chemical, and Atomic Workers Union, whose membership is highly concerned about reproductive hazards. "The dearth of data on reproductive hazards for females is abominable," says Rudolph, explaining that women in

high-tech industries are working with many chemicals that haven't been tested for reproductive effects.

"Here we have millions of women in workplaces with potentially high exposure to hazardous chemicals, and the fact that we can't say much about the reproductive hazards is unjustifiable," says Rudolph. Their goal as public health workers, she adds, "is not to force women out of 'hazardous' jobs but to reduce hazardous exposures for *all* workers. Job loss and poverty also lead to poor reproductive health."

Among the high-tech hazards they discuss are: **Glycol ethers.** Widely used as solvent in the process of imprinting the circuit boards in Silicon Valley, these chemicals are known to impair sperm development and cause severe birth defects in the offspring of test animals exposed even to low doses. According to a California state report, they do their damage at concentrations disturbingly close to those allowed in the workplace. "There's no question that there's enough evidence to take steps to protect workers," says

Rudolph. "The OSHA [Occupational Safety and Health Administration] levels for glycol ethers are no longer appropriate," says Richard Wise, a health and safety officer for Union Carbide, which produces the chemicals under the brand name Cellosolve.

**Arsenic.** More and more semiconductor plants are now using arsenic compounds to make a new kind of chip favored by the military. This poisonous element has been shown in animal tests to cross the placenta and cause birth defects. Pregnant women exposed to arsenic among other tested elements also run an increased risk of

miscarriage, according to studies on metal workers in Finland. In a 1982 study, cited in a U.S. Office of Technology report, the wives of workers in a Scandinavian community exposed to arsenic and other metals had a higher rate of spontaneous abortion as well. Officials of the National Institute for Occupational Safety and Health (NIOSH) recently reported traces of arsenic in the air of various semiconductor plants they surveyed.

**Lead.** Used in soldering and other operations in high tech, lead may represent another reproductive hazard. A 1980

medical study of 35,000 female factory workers in Finland found an unusually high rate of miscarriages among electronics workers in general, and solderers in particular.

**Radiation.** Some semiconductor plants now use radiofrequency radiation to etch and clean silicon wafers, and according to an unpublished federal report by NIOSH, the equipment used by the workers generates potentially hazardous amounts. In addition, overexposure to this type of radiation can raise the body temperature, an effect that may be hazardous for pregnant workers. "We do not know how high the temperature must rise to be hazardous," says Dr. Sterling Clarren of the University of Washington Medical School, but he says there is enough evidence in animal research to suggest that high body temperature can possibly damage human fetuses.

The reproductive hazards of high-tech chemicals and metals may not be limited to women and men working in the industry. Swan directed a 1984 study in which California state investigators found that women in a San Jose neighborhood whose drinking

water was contaminated with the toxic solvent 1,1,1, trichloroethane (TCA) from a nearby electronics plant had twice as many miscarriages—and their offspring had three times as many birth defects—as those of a control group. Swan said that the state "was hesitant to conclude that the problems were solely due to the water."

## Your Right To Know

BY JOANNE EDGAR

The first step in countering dangerous substances is recognizing them. There are about 25 million workers in the United States who are "potentially exposed" to chemical health hazards, according to Congress's Office of Technology Assessment. Of these, an estimated 15 million are covered by the Federal Hazard Communication Standard issued by the Occupational Safety and Health Administration. Called the workers' Right-To-Know rule, this federal standard requires manufacturers, importers, and distributors to provide workers with information on hazardous substances and labeling of

but obviously we're very concerned. We're putting a lot of time and resources into designing follow-up studies trying to better understand what happened." Rudolph adds that the toxic pollution in San Jose could exist in any high-tech center. "There's nothing unique about the electronics industry in Silicon Valley."

chemical containers.

OSHA's ruling is a start, but many feel it's not enough. Critics claim that employers are given too much discretion under this standard, and that they may not report to their employees all known facts about a given chemical's dangers. The OSHA rule does not include nonmanufacturing personnel, such as office workers, even if they work in the chemical manufacturing field; nor does it cover public employees, or commercial, nonmanufacturing "downstream" users of chemicals (such as agricultural workers). In addition, the manufacturers and importers themselves decide which chemicals are considered hazardous and in doing so may use (but are not

required to use) OSHA's list of references of studies on health hazards of specific chemicals. The manufacturers or importers can also withhold the identity of the chemical and other information if they believe that information to be a trade secret—though they still must release information on the hazards of the chemical. (Because of this loophole, some activists call the OSHA rule the "Right-To-Hide" rule.)

The OSHA rule requires disclosure of substances that contain 0.1 percent (or more) of carcinogens or 1 percent (or more) of hazardous substances. These concentration levels have been criticized as arbitrary and some charge they provide inadequate safeguards to workers.

Both the Senate and the House recently passed a community Right-To-Know provision in the Superfund Toxic Waste Cleanup bill, and as we went to press, it was in conference committee to draft a compromise version. To be enforced by the Environmental Protection Agency, the legislation requires companies to report to communities identities, quantities, risks, and locations of hazardous chemicals. Currently, 31 states,\* and

a number of cities and other localities, have passed their own primarily worker Right-To-Know laws, most of which are more comprehensive than the federal ruling. They cover a larger working population and usually include all employees who come in contact with hazardous chemicals in the workplace (with the exclusion, however, of domestic workers and agricultural workers in some states). Most statutes call for an automatic review of any case where a manufacturer cites a trade secret. In addition, most states themselves, as opposed to the manufacturers, decide which chemicals are included, and many define "hazardous" more broadly than does OSHA. However, there is some question as to whether the OSHA ruling has precedence over the state laws, and that issue is currently under review by the courts.

\*The states with Right-To-Know laws are Alabama, Alaska, Arkansas, California, Connecticut, Delaware, Florida, Georgia, Illinois, Iowa, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Vermont, Washington, West Virginia, and Wisconsin.

## WHERE TO GET HELP

### ORGANIZATIONS

#### COSH Groups: What Are They?

COSH groups are grass-roots Committees on Occupational Safety and Health. Catalysts to improve workplace environments, they serve as networking resources, provide information about workplace hazards, lobby for protective standards, and support strict Right-To-Know legislation as well as union organization.

Initially funded in part by the Carter Administration, the 40 COSH groups across the United States are struggling to

survive as public money has dried up. The following three COSH groups focus on the high-tech industry.

- **Santa Clara Center for Occupational Safety and Health** (277 W. Hedding St., Suite 213, San Jose, Calif. 95110; call 408-998-4050). SCCOSH provides information on chemicals used in Silicon Valley high-tech industries. It also supports unionizing efforts and assists local unions in improving working conditions. Booklets available: "Unmasking the Hazards" (\$6) and "Toxic Substances Commonly Found in the Electronics Industry" (\$10).

(Reduced prices are available for nonprofit organizations.) A subsidiary group, *Injured Workers United*, provides support and advocacy for workers who get injured or sick on the job.

- **Massachusetts Coalition for Occupational Safety and Health** (718 Huntington Ave., Boston, Mass. 02115; call 617-277-0097). MassCOSH focuses on occupational health and also provides information on the toxicity of various chemicals. Its health technical committee includes industrial hygienists and other health professionals. Publications are available upon request.

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- **North Carolina Occupational Safety and Health Project** (P.O. Box 2514, Durham, N.C. 27705; call 919-286-9249).

Last year NCCOSH successfully lobbied for a state Right-To-Know law. The group provides workshops to train and educate union and community members on toxics and other hazards in the workplace.

**Integrated Circuit** (c/o Michael Eisenscher, West Coast Coordinator, 138 South 20 St., San Jose, Calif. 95116; and c/o Rand Wilson and Ken Geiser, East Coast Coordinators, P.O. Box 1342, Brookline, Mass. 02146; call 617-666-4149).

Integrated Circuit is a recently organized network of community activists seeking to develop alternative policy perspectives on the entire high-tech industry. It will address workers' rights, environmental protection, the responsibilities of firms to communities and minority groups, as well as implications of the technology and the uses to which it is put. Integrated Circuit is also interested in the unionization of this so-far highly unorganized field. The group, with affiliates across the nation, focuses on worker experiences in Silicon Valley, California; Route 128 in Massachusetts; and Research Triangle Park in North Carolina. A report on conclusions drawn at a national organizing meeting last May will be available this spring.

**Silicon Valley Toxics Coalition** (277 W. Hedding St., #208, San Jose, Calif. 95110; contact director Ted Smith at 408-287-6707). This coalition focuses on groundwater cleanup. Smith says that since 1982 there have been more than 100 toxic chemical spills discovered in the Silicon Valley area. Since groundwater contamination affects the entire community, the organizing base of the coalition goes beyond the workers in the electronics industry itself. As Smith says, "This is one way of making the high-tech industry more responsible for its chemical practices."

**Public Citizen Health Research Group** (2000 P St., N.W., Washington, D.C. 20036; call 202-872-0320). This general health group is part of the Ralph Nader network of organizations. It provides information on specific chemical hazards and is a networking and legal resource for local COSH groups; it is also a lobbying force on behalf of workers, both union and nonunion, and is aimed at strengthening laws on protection from hazards

in the workplace.

**Women's Occupational Health Resource Center** (Columbia University School of Public Health, 600 West 168 St., New York, N.Y. 10032; Jeanne M. Stellman, Ph.D., executive director). This is a resource for information on health risks in the workplace. Reading lists and "factpacks" are available on various occupational hazards. A bimonthly newsletter costs \$12 a year.

**National Campaign Against Toxic Hazards** (1300 Connecticut Ave., N.W., Suite 401, Washington, D.C. 20036; call 202-775-0370). This group, through local affiliates across the country, assists in organizing and lobbying.

**Occupational Health Legal Rights Foundation** (815 16 St., N.W., Suite 301, Washington, D.C. 20006). A nonprofit corporation established by the Industrial Union Department of the AFL-CIO, this organization exists primarily to assist union members and their families (through their union representatives) in obtaining legal representation regarding occupational illnesses. Services are also available to nonunion workers. An associated group at the same address, **Workplace Health Fund** (202-842-7832), is a private nonprofit agency that focuses on health and disease in the workplace—providing research and education to workers and their families.

**The Health Hazard Evaluation Program** (National Institute for Occupational Safety and Health, Hazard Evaluation and Technical Assistance Branch, 4676 Columbia Parkway, Cincinnati, Ohio 45226; call 513-841-4382). This government-sponsored program conducts hazard evaluations, including tests of the workplace environment and individual medical tests. Each request is evaluated and answered; last year researchers completed 536

investigations nationwide. For information, write and describe your problem to one of the program's industrial hygienists.

## PUBLICATIONS

**Double Exposure: Women's Health Hazards on the Job and at Home**, edited by Wendy Chavkin, M.D. (Monthly Review Press, \$10). A 1984 collection of studies on health risks associated with a wide range of professions. The chapter on the electronics industry is crammed with statistics on numbers of women in the industry, information on wage disparities, and, of course, chemical hazards and stresses of the workplace. The difficulties faced by union organizers are discussed. The chapter is a concise indictment of the industry's workplace standards, and the entire book is a useful resource for worker-health activists.

**The High Cost of High Tech: The Dark Side of the Chip**, by Lenny Siegel and John Markoff (Harper & Row, \$16.50). The authors claim that the "manufacture of chips, printed circuit boards, magnetic media, and other high-tech products uses some of the most dangerous materials known to humanity." Their book deals with the dangers posed by computer technology to the worker, the environment, and society. Two chapters—"The Silicon Rush" and "The Toxic Time Bomb"—charge the industry with avoiding its responsibility to protect the health of workers and the environment. The authors also believe that computer technology attacks not only our health but our privacy.

**High Tech and Toxics: A Guide for Local Communities**, by Susan Sherry et al. (Conference on Alternative State and Local Policies, 200 Florida Avenue, N.W., Washington, D.C. 20009; call

202-387-6030; \$19.95 for individuals and unions; \$39.95 for corporations and federal agencies). A comprehensive manual, published in late 1985, that takes the mask off the "clean and safe" high-tech industry. This 470-page work includes descriptions of the entire spectrum of hazardous materials used in the industry, worker case studies, and information on local government efforts on behalf of workers. The Conference on Alternative State and Local Policies is a nonprofit national public policy center, which can put community groups in touch with sympathetic legislators.

**Reproductive Health Hazards in the Workplace** (Office of Technology Assessment, U.S. Congress, Washington, D.C. 20510). Requested by the House of Representatives Committee on Science and Technology, this extensive report, published in December, 1985, reviews current knowledge of hazards and suspected hazards to the reproductive health of women and men and to the health of their children. A 43-page summary report is available free from the OTA.

**"The Not-So-Clean Business of Making Chips,"** by Joseph LaDou, M.D. (*Technology Review*, May/June, 1984). LaDou presents the process of chip manufacture clearly and concisely, and discusses the hazards of chemicals used in this process. He traces the growing awareness of dangers on the part of workers and governmental agencies, and reports on the apparent attempts by the industry to cover up the truth, as well as on those industry representatives who have rectified hazardous conditions.

**Work Is Dangerous to Your Health**, by Jeanne Stellman, Ph.D., and Susan Daum, M.D. (Pantheon, \$5.95). A 1973 handbook of hazards in the workplace. **MS**

## Silicon Valley

CONTINUED FROM PAGE 42

of the top five semiconductor manufacturing firms in the country. Workers at AMD had called in NIOSH when they suspected trouble. Dr. Coyle was forced to subpoena health records when AMD refused to cooperate, a harassment tactic only, since NIOSH has the power to review company health records. All of this wrangling took time and when it was over, Coyle had left NIOSH to work for the New Jersey governor's office; many of the AMD workers had moved on; and no one at NIOSH picked up what would have been the first retrospective study of worker health in the U.S. electronics industry.

One current NIOSH official, who did not want to be identified, was asked why NIOSH, the federal agency responsible for producing studies like this, hadn't produced any. "We're a small agency," he said, "with few resources. Our problem is that we have never been able to get in and evaluate the situation. The companies won't let us." He felt to do the kind of study that needs to be done, NIOSH needs industry cooperation, and if Dr. Coyle's experience is any indication, he's probably right.

When you tell him stories of aborted studies, Joe LaDou laughs sagely and says, "At any typical electronics company, hundreds of chemicals are used daily. The mix in the air of the work areas is a puzzle that could take us decades to unravel. Once we get a study going, if we do, it will take at least ten years to evaluate what is really happening to the workers."

# WHAT IS REALLY HAPPENING IS A MATTER OF GREAT DEBATE IN SILICON VALLEY, BUT IT IS NO LONGER DEBATABLE TO PEOPLE LIKE SANDY EDTRICH AND NANCY ALAURA.

After they stopped working at Harris-Farinon (Sandy in 1980 and Nancy in 1981), they discovered that the headaches, the nausea, the memory loss, the infections did not go away. For nearly a year, the women went through "withdrawal" as their bodies tried to recover from the chemicals, a reaction most doctors say is a common effect from chronic exposure to organic solvents. They also found that they had developed strange allergic reactions to ink, perfume, gasoline and heating fuel,

household chemicals, and so on. Their symptoms would become much worse—totally incapacitating—when they were around these substances. Nancy found that they sometimes stopped her breathing. Sandy complained that the symptoms seemed still related to her menstrual cycle. They changed their clothes, their food, their furniture, their carpeting. They sought "clean air" at the beach. They stopped shopping and eventually stopped going out much at all—anything to "get better."

Reports continue today of more and more electronics workers developing symptoms like these. Mandy Hawes and other attorneys keep filing cases for something called "chemical hypersensitivity." Hawes says she has "at least a hundred" cases of occupational illness from chemical exposure in litigation at any one time—including dozens for chemical hypersensitivity. None of the doctors, though, really understand what disease these people are suffering from or how to treat it, if it is treatable. There are theories, only theories.

Joe LaDou says that "chemical hypersensitivity" is not mainstream medicine; at least not yet. Because there are no studies, doctors base their diagnosis on what they do know, and that information comes primarily from the chemical industry's experience.

They do know that organic industrial solvents cause a great many of these symptoms—headache, fatigue, memory loss, central nervous system damage, depression, reduced interest in sex, disorientation, difficulty with concentration and learning, motor skill problems, early dementia. They do not know if the incredibly large mix of solvents used in electronics makes all these symptoms worse than the effects of solvents used individually, but it's a good guess that they do. Most of these doctors agree that people sometimes "feel better" years after they have been away from the chemicals, but as one physician said sadly of people suffering from chronic solvent intoxication, "in terms of objective measurements of their abilities... they tend to decline."

Dr. LaDou never examined Sandy Edrich or Nancy Alaura. He did look over a list of chemicals that they used in Thin Film, their descriptions of what they did

with the material, and the hours they worked. Holding the papers, he was silent for a moment, shook his head, and then looked up and said, "Have these women had any miscarriages in the seven or eight years they worked there?"

He was especially concerned when he asked that question about a solvent in the photoresist Sandy and Nancy both used called "cellosolve acetate," a class of chemical known as a glycol ether.

The industry knew it was in trouble with cellosolve as early as the end of 1981 or the beginning of 1982 when industry studies showed the solvent was extremely fetotoxic: it caused miscarriages in test animals. Later reports confirmed that the solvent also caused birth defects in at least three species of animals. By May, 1982, the Semiconductor Industry Association (SIA) itself recommended to semiconductor executives that they voluntarily cut exposure levels to five parts per million (over an eight-hour work period), and some companies began looking for a replacement.

The California State Department of Health issued a "Hazard Alert" in 1982 saying the chemicals in this class "caused serious birth defects in the offspring of test animals exposed during pregnancy" and pointing out that "glycol ethers have not been tested for their ability to cause cancer."


The U.S. Environmental Protection Agency, in a draft report of December 12, 1984, assessed the risk of continued use of glycol ethers in industry and in the home. (Glycol ethers are used in oven and glass cleaners, in printing ink and perfume, and in paints, stains, furniture refinishing compounds, and more.) Based on the requirements of the Toxic Substances Control Act and its own evaluation, the EPA staff recommended banning glycol ethers for all except industrial uses, such as semiconductor fabrication. There, EPA staff said the maximum allowable exposure for workers should be reduced for cellosolve acetate to 0.5 parts per million. This is the first time the EPA has tried to move against a commercial chemical under the Toxic Substances Control Act because it causes birth defects, miscarriages, and other reproductive problems.

Dr. Harry Teitelbaum at the EPA is the man who prepared that December, 1984, risk analysis and his office recommended the ban and exposure reduction; a level, by the way, that the EPA staff believes most companies in the semiconductor industry can meet if they want to. "The new plants, anyway," Teitelbaum says, "it's really unlikely in any open system, though." An open system is one in which processing is done

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Teitelbaum's office sent its proposal for the glycol ethers up the EPA hierarchy. The EPA's Office of General Counsel suggested that rather than ban glycol ethers, the EPA should turn over regulatory authority to the Consumer Product Safety Commission (in the case of home products that contain the chemicals) and the Occupational Safety and Health Administration (for regulating industrial use). This bureaucratic tug-of-war over which agency should regulate the glycol ethers continues.

"My personal feeling is," Teitelbaum says, "that they're never going to do anything about it. OSHA can set a new standard for trade uses, but they can't possibly enforce it." The current OSHA industrial standard for cellosolve acetate is 100 parts per million or 200 times what the EPA has tried to mandate. That is where the case of cellosolve remains over a year after the EPA staff issued its call to action.

#### THE POSSIBLE EFFECTS

of all those years of breathing cellosolve were not lost on the doctor whom Mandy Hawes sent Sandy and Nancy to see. Dr. Alan Levin, a San Francisco immunologist and allergist, looked at Nancy's history, found she was pregnant (and didn't know it because she hadn't missed a period), and suggested that maybe the "irregularity" of her "bad periods" had probably been caused by an inordinate number of regular, spontaneous abortions. And there was more.

Levin ran a battery of tests on both women. Sandy will never forget the day in late 1981 he called her at home with this diagnosis: "I'm dying, aren't I?" she said when she answered the phone.

"You're not dying," Dr. Levin said. His diagnosis: chemically induced, acquired immune dysfunction.

Levin's theory, which he admits is a theory, is that "chemical hypersensitivity" is the result of damage to the immune system caused by toxic chemicals. The immune system is taxed as it fights off the effect of toxic chemicals and, to simplify a very complex theory, if it is taxed too often, it becomes unable to suppress allergic reactions as it once could. His diagnosis was based on his discovery that Sandy and Nancy both had "abnormal T-cell function," meaning that one particular cell system in the body, designed to clean up other damaged cells, simply wasn't working as it should. "It's totally logical that Sandy Edrich and Nancy Alaura would be sick,"

Levin says. "If you look at the type of environment they worked in, most people would be made sick."

Levin is the black sheep of the Silicon Valley doctors, because he is operating on the frontiers of toxic science. AIDS research is only now allowing doctors to learn about the immune system and what harms it, and far too little research has been done on toxic chemicals, particularly solvents. Another physician who saw Sandy, however, does not dismiss Levin's theories. Dr. Jim Cone, of San Francisco General Hospital's Occupational Health Clinic and former chair of the American Public Health Association's Occupational Health Section, is an expert on organic solvents. "These people definitely have a problem, whether it's called acquired immune dysfunction, or something else," he says. "There are certainly immune problems. There are certainly symptoms here that we see with chronic solvent intoxication. What solvents cause immune system problems? I don't think we know."

By September, 1985, Sandy and Nancy's workers' comp claims were settled. Sandy received \$32,800 and Nancy \$21,000, which, Hawes says, are "significant settlements." Medical tests submitted by Mandy Hawes in the case indicated Sandy had more health problems, greater disability, than Nancy, perhaps resulting from the fact that in seven years Sandy never worked away from the solvents.

"Some of the manufacturers' defense attorneys have asked me, 'How many more cases like this do you have?'" Mandy Hawes says, angrily. "And I have to say, 'Well, how many times have your clients supplied these products to Silicon Valley with lousy or incomplete or misleading information about the health risks? You tell me that, and we'll have some idea of the potential for litigation in this Valley.'" Hawes is taking depositions now in the damage suit against Harris-Farion and others. Sandy remembers that one of the lawyers asked her, "Who are your friends?"

"That part hurts," she says. "I used to have so many friends. I used to have parties." She sees almost no one now except her sons and Nancy, because a person wearing hair spray or perfume, a thoughtless smoker, can send her into an allergic reaction that can take weeks to recover from. And there are still the headaches, constant headaches, headaches that require strong painkillers. In five years away from Harris-Farion, she says that they have been with her every day. She has trouble concentrating. She can't remember. She blanks

out. She feels like a vegetable. "I want to be sharp," she says sadly, "like I used to be. I want to be interesting."

Nancy experiences all of this too, reactions that Randy Alaura calls "deathly." Two Christmases ago, the paramedics came and took Nancy away because of a reaction to chemical fumes from a pressed log at her parents home during a holiday party. "I really thought I was dying," Nancy remembers. "I was in bed for five days before I could even walk."

For all the physical trauma, some of the worst of what has happened to Sandy Edrich and Nancy Alaura is their overwhelming sense of betrayal. Sandy says, "I feel like a disposable person."

They play "what if" a great deal. "If Mike Friedentbach had known," Nancy says, "I can't believe he would have let this happen."

"If Bill Farion had stayed," Sandy says, "I like to think he would have stopped this...."

Mike Friedentbach now works at a new company in Silicon Valley called Digital Microwave, with Farion's old general manager, Bill Gibson. He said he had heard that "Nancy started to get into some difficulties that she claims were work-related," but he was not familiar with the "real specifics," and he said he didn't know "how that ended up."

Gibson said that he'd heard the two women were on long-term disability "because of some malfunction in their uh, where they continue to catch colds," but that he was not really involved in the details. He left Harris-Farion in 1983, and says that both the old Thin Film lab on Washington Street and the new one, on Varian, continually passed OSHA inspections without incident. "To my knowledge," he said, "there never was any exposure to hazardous chemicals or anything of that nature. I would never have run a company that way...."

California OSHA does not keep records after three years and could not speak to Bill Gibson's recollections. Cal-OSHA did note that Harris-Farion was inspected in August, 1985, and was cited for one "serious" and nine "general" violations. Of those nine, most related to failure to test and maintain ventilation equipment properly or failure to properly inform production employees about the nature and use of the toxic chemicals they were working with. As a result of that inspection, Cal-OSHA fined Harris-Farion \$695 and insisted that it abate these practices. Harris-Farion wrote to OSHA saying that it had done so.

Harris-Farion refused to comment on Sandy and Nancy's illnesses because their case is in litigation. A spokeswoman there said she wasn't sure where Bill Farion could be reached, or if he knew what had happened. Farion is now a multimillionaire. "He could be in his villa in Italy," she said, "or his penthouse in New York."

In fact, Bill Farion lives in Hawaii. Sandy is sure he would remember her because they cooked chili con queso at Christmas. Sandy is sure if Bill Farion had stayed, none of this would have happened. Bill Farion said he had not been actively involved in production since the early days of the company. He had not heard that Sandy and Nancy were sick. "I remember the names," he said, "but I can't put faces on them." The old Thin Film lab on Washington Street is gone now. Harris-Farion still owns the building, but the excitement of discovery once contained in those rooms has passed.

**THE** Amanda Spake writes regularly for the Washington "Post" and is a contributing editor to "Ms." Research support for this article was provided by the Women in the Eighties project of the Center for Investigative Reporting in San Francisco, California. Special assistance was given by Diana Hembree of the Center.

## ON HIGH-TECH DISEASE

Jean Auel's *Anthropology, and Mother Teresa's Piety*

This past weekend my nephew Nathan, who is 10, was staying at our home. While we made popcorn, he was pushing himself up on the kitchen counter. "If I do this long enough," he said, "I'll be as strong as Mary Lou Retton."

Molly Henderson  
Lancaster, Pa.

I am an 82-year-old woman. I like so many of the changes that have come during the years that I have lived—during World War I and II when women had to take over men's work. They did a good job of it and gained more freedom in dress. It took courage to be the first to start a new way of life for women. I remember when I had my hair cut—it was sinful. It took me years to get up the courage to wear slacks.

Yes, I have changed with the years, and I like most of the changes. I am for Women's Rights and Children's Rights.

Laura Whitebread  
Salina, Kans.

### "I feel rage and I feel hope for Sandy and Nancy"

It was with trembling hands and a heavy heart that I read of Nancy Alaura and Sandy Edrich's ordeal ("High-Tech Disease: Is This a New American Nightmare?" by Amanda Spake, March, 1986). These two American dreamers were hardworking and loyal, and what they got for their reward were failed pregnancies, chronic memory loss, and acquired immune dysfunction.

I was reminded of Karen Silkwood, who was contaminated by plutonium while working at Kerr-McGee and died under questionable circumstances while trying to bring the news of health risks to her fellow workers.

Here's hoping that no one stifles Sandy and Nancy's cries of injustice and that the telling of their story will prompt others to question what potentially harmful substances they are being exposed to in their own workplace.

I feel rage and I feel hope that someday Sandy and Nancy may rebuild their dreams.

Lisa Ellis  
Ayer, Mass.

Back in 1965, a major electronics firm hired my then-husband to head their photomask lab. He had been the plant chemist at a branch plant in Pennsylvania. After being in California for a while, he and his coworkers used to joke, "Everyone thinks we're in the electronics business, but it's really the chemical business." The average person not connected with the industry would be horrified to see the amount of chemicals used by the electronic silicon-wafer manufacturers and the working conditions in many of these palaces of "higher technology." Clean rooms, indeed!

Anyone who develops a process and claims that she or he does not know what components are being used is a liar. Walking into any of these facilities or labs is an assault on the senses. Those who say there is no smell or danger to the body while working with hydrochloric acid, cyanide, and mercury washes have their head someplace other than on their shoulders. For 20 years, I have been listening to managerial types talk about these problems.

In most plants, attitudes toward the workers hark back to the Middle Ages. Women outnumber men in the assembly rooms and labs, and considering the vast profits made by the owners, these workers are underpaid. Unions are not allowed in the Valley.

Politics are rampant there—male politics, that is. Since money and power are the name of the game, no one wants to take the responsibility for unsafe work conditions. The men will bat the problem from one group to another for years, and there will be little or no study of workers' health. When that profit margin dips, or enough workers protest, companies just pull up stakes and head off to exploit Third World women.

As I write this, I think of the people I knew in the little Pennsylvania community with the plant from where we moved. The windows of surrounding houses and neighborhood cars had to be replaced regularly because they were etched by hydrochloric acid fumes from the factory. The plant manager used to deliver baskets of food at Thanksgiving and Christmas to the families of men who were dying from lungs eaten away from working with this acid.

Su-Lin Mosier  
Aptos, Calif.

*Click!* Curious how not a lot of serious study is done on the effects of toxic chemicals on female workers, until it has been determined that their reproductive capacity has been affected. I refer to Amanda Spake's comment that "the industry knew it was in trouble with cellulose" when "industry studies showed the solvent was extremely fetotoxic: it caused miscarriages in test animals." I assume "gynotoxic" was not enough cause for concern?

Maybe, after the publication of your fine and extensive article, action will be taken. Or, then again, given today's political climate, maybe not.

Constance Callinicos  
Pasadena, Calif.

Because I was a victim of chemical pollution, Amanda Spake's article is as refreshing as the *clean air* I eventually found.

No medical person in my hometown area could help me—each suggested I see a psychiatrist. But I knew that every time I was directly exposed to petrochemical fumes, the result of a heat/vacuum process of forming plastic, my symptoms intensified. I suffered from incontinence, malaise, memory loss, insomnia; I couldn't spell or work with figures; my delayed reaction time nearly caused car accidents. Perfumes, car exhausts, acetone, paints, cosmetics, and even some foods all deepened my symptoms. My husband yelled and screamed at me and called me a liar. Still I had no medical help.

To make a very long story short—I now live (alone) in the *great* north woods area. I take walks and revel in the clean air and in my ability to breathe, sleep, eat normally, and study and read again. It has been three years now, and I am so much better.

(name withheld)

It appears that, once again, it all comes down to patriarchal capitalism. Give the women the least safe environment, the least amount of money, and a false sense of importance and belonging—and give yourself a fat wallet and no conscience, forget their faces and almost their names, and watch them die slowly.

Now that the facts are beginning to be known about the risks involved in this

type of work—in Silicon Valley and in offices and factories everywhere—women should not work *another day* in this environment until it's cleaned up. No job is worth death—or chemical hypersensitivity, continual illnesses, or miscarriages. Industry has to clean up its act!

(name withheld)

The saddest part is Sandy's belief that Bill Farinon [her former employer] would not have let it happen if he had stayed, and that he would remember her because they cooked chili con queso at Christmas together! She bought the old myth, "We are all one big happy family!"

Mary Ellen White-Vondran  
Los Altos, Calif.

I was interested to read the articles on the potential reproductive hazards encountered by women in industry. Your list of places to get help on these issues should include the Reproductive Toxicology Center (RTC, 2425 L Street, N.W., Washington, D.C., 20037; 202 293-5137). The RTC is a nonprofit foundation dedicated to disseminating information about environmental (including occupational) exposures and their effects on reproduction. Our computerized information system is designed for use by physicians, industrial hygienists, and other health professionals. A similar computerized information system for people without medical training is currently under development.

Anthony R. Scialli, M.D.  
Director, RTC  
Washington, D.C.

I am one of the many "unlucky" ones suffering from the "unknown" new condition, *chemical sensitivity*. I am plagued by many reactions to foreign agents, chemicals, and foods, and after years of feeling awful, moody, ill, and tired, finally I saw the *right* doctor—the one all other doctors I was seeing called a "quack." After a few weeks of commonsense guidance, some tests, and only one medication, I was so much better. For the first time I saw that what I *did* could make me sick or well. I learned to "clean up" my home, my diet, my surroundings. I removed every cleaner and bug spray I had collected for years from under my kitchen sink, replacing them with efficient but nontoxic (to me) alternatives, such as baking soda and boric acid (for roaches). No perfume was allowed near me or the house. I still can remember informing a weekend house guest that she had to go outside in 30-degree weather to use her hair spray. It was either that or fall over from the fumes.

Thank God I've given my body a

rest, and it's beginning to resist *some* of the common hazards of this 20th-century world again.

(name withheld)

More and more women are concerned about a widening range of occupational and environmental hazards—from "tight building syndrome" to toxins in breast milk—and are dealing with policies that may be just as hazardous: "fetal protection" policies and corporate fertility screening. As the National Women's Health Network Committee on Occupational and Environmental Health, we are researching a *Woman's Guide to Occupational and Environmental Health*, which will provide an overview of the hazards and the responses (medical, legal, corporate, governmental), as well as the relevant resources and organizations, and the indications for the women's health movement.

We urge anyone in any way concerned with women's occupational/environmental health to send materials that could be valuable for the *Guide* and our Network Information Clearinghouse: research findings and research projects underway; information about litigation; the efforts of unions, community organizations, and environmental groups and women's health groups; lessons learned from organizing efforts; case descriptions of problems suspected, identified, and dealt with; information on sexual harassment as an occupational health hazard. Send information to: Reggie Kenen, 15 Forester Drive, Princeton, New Jersey 08540; Susan Klitzman, Institute for Social Research, Survey Research Center, University of Michigan, Ann Arbor, Michigan 48106; or Lin Nelson, 860 Maryland Avenue, Syracuse, New York 13210.

Lin Nelson  
Syracuse, N.Y.

I greatly enjoyed your March issue, but you must have been asleep at the switches to let Stephanie Harrington slip in. "Mother Teresa: The Last Obedient Woman" was a sad but true-to-life representation of feminists who place power through position over the virtues of compassion, humility, and a determined will. Starving children who live in wretchedness do not *need*. Cardinal Teresa to analyze and criticize... there are plenty of us already doing this in the privacy of our own ivory towers. Harrington's idea of equality within the church is hollow because it is based solely on authority. And what exactly does one do with this authority? Does it go beyond the desk nameplate, fumble

down the stairway, and find its midst of real hunger? Rarely, I'm

Certainly, feminist support the church is an issue of concern the face of human suffering it little significance.

Margaret McL  
Lawrence

## "Mother Teresa lacks humility of self-doubt"

Mother Teresa, in spite of her abnegation, lacks the humility and doubt, a characteristic she shares with President Reagan, who never questioned his beliefs either.

Mother Teresa does not understand her perception of the will of God. It is a bit arrogant of anyone to try to understand God's plan for us.

True  
Rus

Mother Teresa is an obedient woman, but perhaps not in the way we might see her. We see her as obedient to a male-dominated authority church. On the contrary, she is a church of great ego strength, obedient to her own conscience. By her presence allows us to raise our consciences in defiance or anger or simply in rebellion. She helps us to clarify our thoughts and decisions about the issues. In the opening sentence of the article, Harrington reveals the traditional Catholic standby, stating the "least comfortable of the less comfortable to contradict a saint." Saints live lives with contradiction. The most comfortable sin is that of not being to oneself.

Denise  
Mt. St.

Your article on Mother Teresa couldn't have been better timed. I, a 21-year-old Catholic female who happens to be a feminist, have encountered much conflict over the expectations of me as a woman. I helped me enormously by letting me know that I am not alone in my questioning and rebellion, and by providing information on helpful organizations like Catholics for a Free Church. Thank you for supporting me!

(name withheld)

Thanks for the March article that takes on the "Job" (by Meg Wheatley and Marcie Schorr Hirsch). I've recently come an associate at a smallish litigation law firm, the kind of position that