

State of Wisconsin study. Yet, because of tight production schedules, many foundries have no rest periods and only half-hour lunch breaks.

Foundry workers in California claim the seriousness of accidents is not recognized. Those injured seriously enough to be hospitalized may be returned immediately to light duty so the foundry won't have to report lost time. Frequently, injured workers have to wait for management to determine the injury's severity before an ambulance is called. Many workers say their injuries are worsened by such delays in the arrival of medical help.

Foundry work actually begins with mold and core making. A form containing a core is sprayed with a "mold release" such as silica flour or talc (French chalk), packed and compressed with sand or clay, then baked (unless the process is "no-bake"). The sand is mixed with sugar, molasses, or plastic resins to keep the mold together. Burns, eye injuries, back injuries, and limb-crushing accidents are common. Sand and silica flour can cause silicosis; talc can cause "white lung" (talcosis), a lung ailment similar to silicosis and common among talc workers. Like asbestos, talc is a hydrated magnesium silicate and is now suspected of being a carcinogen. Exposure to asbestos dust from insulation, especially in the furnace room, is also a potential hazard.

The resins and solvents used to make the cores and molds—phenolic resin, urethane (isocyanate-based) resin, urea formaldehyde, and furan resin—are potential skin irritants. Isocyanates gener-



Smoking molds after casting . . . Inhalation of fumes is one of the leading causes of occupational diseases among foundry workers.

ally irritate the eyes, and respiratory tract as well. Substances such as toluene-2,4-diisocyanates (TDI), and methylene bisphenyl diisocyanates (MDI), used to bind "no-bake" cores may cause asthma-like symptoms at low exposure levels. Under certain conditions, core baking and drying can produce hazardous thermal decomposition products such as ammonia.

While the molds are being formed and moved to the casting floors, the metal is readied for pouring. As scrap or ingot metal is melted in huge furnaces, alloys and chemicals are shoveled or thrown into the molten mass. When the metal reaches the correct temperature, it is poured into a large bucket or ladle. During pouring, furnaces and molten metal produce dangerous levels of carbon monoxide and other fumes which spread throughout the entire foundry. Burns, injuries to the eyes, back, feet and toes, and fingers and hands are common.

In addition, hazards may be produced by furnace maintenance or by-products. After the metal is poured, the ladle is lifted away from the furnace by an overhead crane and moved to various casting floors. The metal is poured into waiting molds or transferred to smaller ladles. Workers pouring molten metal face different dangers than other foundry workers. Ultraviolet radiation from white-hot metal can severely damage unprotected eyes. Molten metal explosions from contact with water or cold surfaces is always a potential cause of severe burns. Water vapor trapped in a closed piece of scrap pipe being melted down can blow up an entire furnace. A sand mold with remaining moisture can explode, throwing molten metal at near-by workers.

Lace boot burns are common. The Wisconsin study found that burns are the fifth most costly foundry accident, yet there are no federal standards for special protective shoes or clothing for foundry workers. The lace boot burn is so common, the report gave it special note: "Once the molten metal has penetrated through the lacings of the shoe or over the top of the shoe or boot, it is virtually impossible to remove the shoe in time to prevent serious burns." Protective gaiter-type shoes and boots are available, but many employers fail to make sure they are worn.

Invisible dangers of casting are just as deadly. Fumes and vapors from chemicals used to prepare molds and molten metal are frequently poisonous. Molds may be sprayed with nickel car-



Metal being transferred to hand-operated ladle for small intricate castings. Heavy metal poisoning takes its toll among foundry workers.

bonyl, a reported carcinogen (cancer-causing substance). Formaldehyde in plastic resins used to bind sand molds ignites when hot metal hits the mold; the fumes can combine spontaneously with hydrochloric acid to form the lung carcinogen bis-chlormethyl ether. At one plant workers exposed to this carcinogen had a lung cancer rate eight times higher than the average population.

The last stop in a casting's journey is the knockout shop. Here, burrs and rough edges are removed from the casting by workers operating torches and grinders. These workers have the highest injury and disease rate in the foundry. The Wisconsin study reports that one-third of the machine-related foundry injuries are caused by grinding machines. Uncovered grinding wheels spinning at top speed frequently explode. Eye injuries and amputations are more common in the knockout shop than in any other part of the foundry.

New chemicals and processes are constantly being introduced into foundries. Few have been tested to discover their effects on the human body. For example, very little is known about the plastic resins used in mold-making or about their decomposition products. What is known is that many foundry workers are being exposed to these chemicals, and foundry workers die younger than other workers. Furnacemen, grinders, and chippers have almost twice the death rate of nonfoundry workers of comparative age groups; for furnacemen, this increase is eighty-three percent.

Without worker and employer action, the foundry work environment won't change. How long will it take? How much disease? How many deaths and injuries before a foundry worker has the right to work in a clean, safe place?

FOUNDRY SILICOSIS—A MAJOR OCCUPATIONAL HAZARD

by SIDNEY WEINSTEIN

Silica is the primary dust hazard in foundries. If breathed in excessive amounts over a period of years, airborne "free" silica can cause a disabling progressive disease known as silicosis. Symptoms—shortness of breath, reduced capacity to work, dry cough, loss of appetite, increasing fatigue—usually appear years after initial exposure. The disease results in extreme fatigue, weight loss, and eventual incapacity to work. The degree of the silica hazard depends upon the dust's crystalline silica content, the size and concentration of airborne particles, and the length of exposure.

Silicosis develops as silica particles become embedded in the lung's walls and scars form. This reduces lung function and breathing capacity. Because there is no satisfactory treatment for silicosis, prevention is critical. Tuberculosis commonly occurs in workers with silicosis and formerly caused the majority of silicosis-related deaths. The tuberculosis can now be treated by chemotherapy. Other silicosis-related causes of death are lung infections and heart disease.

Current Standards

Presently, there's no agreement on the amount of "free" silica a worker may safely inhale although federal guidelines exist. NIOSH has recently published a criteria document proposing that the time-weighted average exposure to free silica be established at 50 micrograms per cubic meter of air. The proposed standard also includes



Workman cleaning a casting with a portable grinding wheel. Note dust moving towards nose and mouth.

provisions for: medical examinations every three years; plainly posted warning signs; engineering controls; employees informed about the hazards of silicosis at the beginning of their employment; and monitoring and record-keeping.

The silica hazard in foundries is often severe. Silica is the main component of the sand used to form sand molds and cores, and of powdered silica mold releases. Silica dust can be found throughout foundries where ventilation is inadequate or nonexistent, or housekeeping is poor. The dust spreads by air currents and machine vibrations from hoppers, conveyor belts, elevators, sand mullers, blenders, etc. Large concentrations of silica dust are potentially found in sand mulling and mixing operations, shakeout, grinding, and sandblasting core knockout. In fact, sand mixers, molders, and grinders are most vulnerable to silico-

sis. Exposure potential is especially high in finishing departments using natural abrasive grinding wheels—silicosis has historically been called "grinder's disease."

Silica levels in many foundries have been shown to be two to four times higher than the maximum allowed by law. One 11-year comparative study of foundry workers exposed to silica dust for 20 years and unexposed auto workers revealed the foundry workers had a mortality rate 28 percent higher than the auto workers. When the study began, those foundry workers' x-rays had been normal. In the same study, the death rate for foundry workers whose original x-rays detected silicosis was 80 percent higher than the auto workers.

Controls and Prevention

Engineering controls and good housekeeping practices are essential to protect workers from the hazards of silica. Ventilation systems, particularly over dust sources such as conveyors and other machines, are key controls. Never dry-sweep the dust or blow it away with compressed air. Instead, use vacuum cleaners or wet-sweeping methods to pick up all spills. All equipment should be properly maintained to prevent leaks and dust build-ups. Respirators should be used where necessary while engineering controls are being worked out or in emergency situations. However, such physically exacting jobs as foundry work makes wearing properly fitted and adequately filtering respirators extremely difficult except for short periods.

RECENT EVENTS

Six Leukemia Deaths Linked to Benzene

Goodyear Tire & Rubber Co. recently confirmed that between 1954 and 1964 six employees at a now-closed plastic film plant died of blood disease possibly caused by exposure to benzene. According to medical records and death certificates, the individuals died of leukemia.

Benzene, a basic hydrocarbon produced from petroleum, is a chemical feedstock used as a raw material for a number of plastic products, including polystyrene. The rubber industry primarily uses benzene as a solvent because it dissolves rubber.

Although the Akron, Ohio plant has been closed for ten years, workers at the film facility were given regular blood tests as early as 1940. According to Goodyear, those showing any abnormalities were removed from that operation until their blood returned to normal.

Canadian Union Workers Win Gains

New contracts negotiated by Steelworkers' Locals 5417 and 5762 give Canadian uranium workers with lengthy exposures to potentially dangerous radiation the right to switch to less dangerous jobs. According to Steelworkers' District 6, this health breakthrough resulted from an "epidemic" of silicosis and lung cancer. Also under the new

contract, companies must notify the union *before* introducing any new chemicals, solvents, equipment, or processes into the workplace, and the union has the right to join company representatives in monthly safety inspections.

—Job Health News Service

Union Halts Glove Co. Use of Asbestos

Workers at Portland Glove Company in Carlton, Oregon, discovered that a commercial talc product containing asbestos fibers was being used in the manufacturing of gloves. The union (Amalgamated Clothing Workers of America) contacted the Occupational Health Section of the Oregon State

Continued on next page

Health Division and received information on the dangers of asbestos.

The union later informed the company that a health hazard was present. The Company then agreed to stop using the talc and to provide a substitute. The alternative substance was approved by the state to be a safe substitute.

—ACWA Voice

Montana State Fed. Opposes Lab Closure

As part of a major effort to prevent closure of the Western Area Laboratory for Occupational Safety and Health (WALOSH) located in Salt Lake City, Utah, the Montana State AFL-CIO is insisting NIOSH hold public hearings before finalizing the facility's closure. Staffed by scientists and technicians specializing in occupational diseases, the WALOSH laboratory has had a great impact on evaluating the effects of toxic gases and chemicals on workers throughout the United States, according to Jim Murray, executive secretary of the labor federation.

Murray said, "the closure of the Salt Lake City laboratory is just another example of the Ford Administration's bureaucratic arrogance which disregards the welfare of workers. Dr. John Finklea, NIOSH Director, arbitrarily decided to close the laboratory without even extending the courtesy of consulting with the health departments in states like Montana and the rest of the western United States." Finklea cited economic reasons for closing the facility.

Worker Complaint Ruled "Concerted Activity"

The National Labor Relations Board has ruled that employees who file safety complaints with either state or federal OSHA are protected by Section 7 of the Taft-Hartley Act and cannot be disciplined or fired for such action. It does not matter whether an employee acts alone or with other employees, or whether the company is union or non-union.

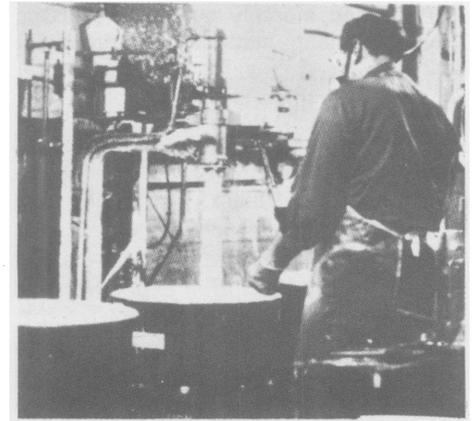
The Board's ruling involves a maintenance worker at the Alleluia Cushion Co. in Commerce, California. Shortly after being hired, the worker began to complain about safety conditions and his inability to communicate essential safety information to the majority of employees because they were Spanish-speaking. Dissatisfied with company responses, he filed a complaint with CAL-OSHA and participated in a walk-around inspection. He was fired the day after the inspection.

Goodrich Reduces VC Exposure

At a year-end press conference, B. F. Goodrich Company president John Ong said that new technology makes it possible for the company to comply with OSHA regulations governing exposure to vinyl chloride gas while at the same time expanding production. "We now believe that the chances are extremely remote of future angiosarcoma cases resulting from vinyl chloride exposure in our current operations," he said.

Angiosarcoma is the rare form of liver cancer which has caused the deaths of about 40 workers in PVC polymerization plants around the world. Goodrich operates one plant that produces vinyl chloride monomer and five plants that transform the gas into polyvinyl chloride, the second largest selling plastic in the United States.

Goodrich is making a capital investment of \$42 million—from 1974 to 1977—toward eliminating the work-



Employee working with PVC slurry.

place health hazard. "However," Ong cautions, "we still face the possibility that, because of the long latency period, we will see other cases of angiosarcoma among workers who experienced exposures at high levels in the past." —Job Safety and Health

In this case, the act of filing a safety complaint constituted *concerted activity* protected by the Taft-Hartley Act because, as the Board noted: (1) the safety improvements sought by this employee would have benefitted his fellow workers, and (2) it could be assumed that other employees would have consented to the action.

Constitutionality of OSHA Penalty System Questioned

The United States Supreme Court has agreed to hear arguments on the constitutionality of OSHA's civil penalty enforcement procedures. Petitions for review filed by several employers attacked the penalty system on Fifth, Sixth, and Seventh amendment grounds.

The employers argued that the Act's supposedly civil penalties are actually criminal sanctions, and as such, the employers are entitled to Sixth Amendment protection given to criminal defendants. However, the Court specifically excluded this issue in its decision granting review.

The employers then argued that even if the Act's penalties are civil in nature, the Seventh Amendment's guarantee of a jury trial in civil actions is being violated. Currently, OSHA penalties are reviewed by an Administrative Law

Judge, and then by a three-member Occupational Safety and Health Review Commission.

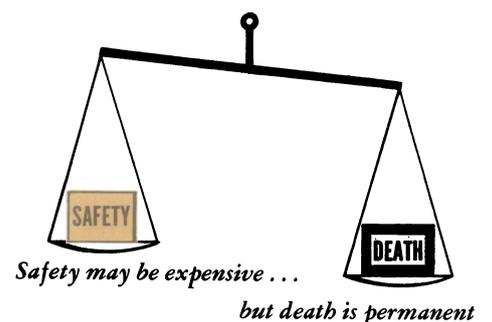
—IBT Shield

OSHA Violation Admitted in Damage Suit

The U.S. Court of Appeals for the Fifth Circuit has ruled that violation of an OSHA safety regulation *can be used as evidence against a company in a lawsuit demanding damages for personal injuries.*

The Court permitted an injured longshoreman to introduce evidence that a barge owner failed to properly secure cargo to prevent its shifting or falling—as required by Sec. 1918.83(A) of the OSHA Regulations. The cargo fell and pinned his leg. He was awarded a judgment of \$144,000.

—OSHA Report



Farm Pesticides Linked to Rare Liver Cancer

Four cases of angiosarcoma, a rare liver cancer, have been diagnosed by two northern Wisconsin clinics during the past two years. This incidence is unusual when compared to the expected incidence among the general population. Thus far, angiosarcoma has been linked with worker exposures to vinyl chloride and arsenic, and to medical use of Thorotrast, a drug banned in the 1930's. Arsenic-based pesticides, at one time used mainly to control potato bugs, are suspected of causing the Wisconsin cancers. Though these pesticides have not been used on most farms for a number of years, scientists from the U.S. Center for Disease Control and Drs. Irving J. Selikoff and Henry A. Anderson from Mt. Sinai Hospital in New York suspect the 20-30 year latency between exposure to a cancer-causing substance and the disease's occurrence may account for the four northern Wisconsin cases. Each of the four individuals had lived on farms and had apparently been exposed to arsenic-based pesticides.

PLEAS OF NO CONTEST

Foundry Shop Fined for Worker's Death

The death of an employee, crushed in a conveyor belt, has resulted in a misdemeanor conviction and \$500 fine for the employer, Delaval Turbine, Inc., of Oakland. Judge Ken Kawaichi of Alameda County Municipal Court, fined Delaval the \$500 maximum penalty after the company entered a *plea of no contest* to the charges!

The Delaval employee, Willie Lee, was performing cleaning operations in the area of a belt-conveyor tail pulley when he was caught in the pulley's nip joint and crushed. He died 55 days later of injuries sustained in the accident.

—Labor Pulse

Gallo Fined \$500 for Workers' Deaths

Two farm workers at Gallo Winery of Modesto were killed on April 11, 1975, when the arms of their pruning machine came in contact with high voltage lines overhead. Criminal charges were filed by the Merced County District Attorney on November 11, 1975, following a Bureau of Investigations (DIS) investigation. The charges were based on Penal Code sec. 385(c),

which prohibits operation of tools and equipment "unless there is posted and maintained in full view of the operator . . . a durable warning sign legible at 12 feet reading: 'Unlawful to operate this equipment within six feet of high voltage lines.'" Gallo entered a *plea of no contest*. The company was fined \$500 on April 9, 1976!

—California Workers' Compensation Reporter

Employer Gets Probation for Worker's Death

Jorge Diaz, a 22-year-old laborer, was killed when he fell 30 feet from the roof of a condominium construction project while removing roofing materials. His death resulted in a \$5,000 fine for the employer, Spacefinders, Inc., a Los Angeles general contractor, and subsequent sentencing of the firm's president, Knight Travis, by Judge Brian Crahan in Los Angeles Municipal Court. Imposition of sentence against Travis as an individual was suspended pending his successful completion of three year's probation.

The complaint against Spacefinders, Inc. and Travis was for violating California Construction Safety Order 1607(a) which requires that safety belts and lifelines be used by employees whose work exposes them to falling more than 15 feet from a structure's perimeter, and California Labor Code sec. 6425 because failure to observe minimum standards for workplace safety and health resulted in injury or death to workers. Sentencing followed a *plea of no contest* to the charge. The case grew out of a Bureau of Investigations (DIS) investigation, and was presented to the court by a deputy city attorney.

—Cal/OSHA Reporter



"I think the safety record of our plant is excellent - especially when you consider how dangerous it is to work there."

DOCTOR'S CORNER

by Donald Whorton, M.D.

Dear Doc:

In my work as a machinist, I frequently use the solvent toluene. Recently one of my co-workers showed me a newspaper clipping stating that toluene is often contaminated with benzene and that benzene is very harmful. Can you explain the difference between the two substances?



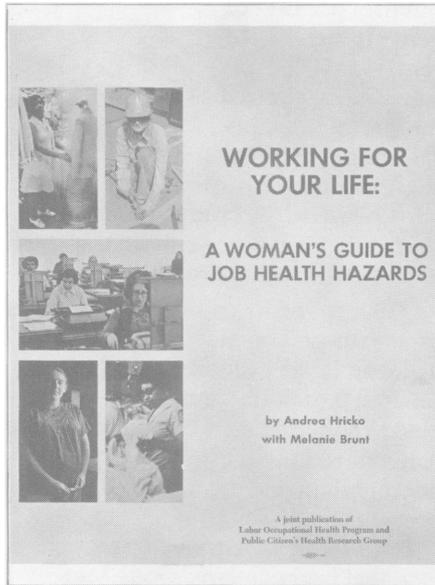
Toluene (also called toluol) is one of the most commonly used solvents. Toluene is very closely related to benzene in structure and often contaminated by benzene in commercial products. It is not unusual for toluene to be contaminated by up to 10 percent benzene.

Both toluene and benzene can affect the brain and nervous system in manners similar to alcohol. Like alcohol, exposure to benzene and toluene can lead to lightheadedness, dizziness, poor coordination, or drunkenness. Workers using toluene complain that they always feel somewhat high or tipsy by the end of the day. They also complain of frequent headaches by the end of their shift. The Department of Labor (OSHA) permits workers to be exposed to 200 parts per million (ppm) of toluene for an 8-hour day. But, at this exposure, you can probably expect to have a headache by the end of the workday.

Unlike toluene, benzene has an additional far more serious, long-term effect. It is toxic to the blood-producing cells in the bone marrow. It effectively destroys these cells, wiping out the body's factory for red blood cells and certain white blood cells, and possibly causing a condition called Aplastic anemia. Unlike other types of anemia, Aplastic anemia does not respond to iron, vitamins, or nutrients because the blood-producing cells have been destroyed. Leukemia, or cancer of the white blood cells, is also associated with long-term exposures to benzene.

The permissible level of benzene is only 10 ppm for an 8-hour day. For workers using toluene contaminated with 10 percent benzene, a 200 ppm exposure to toluene means 20 ppm of benzene or twice the allowable limit. Thus, whenever you use toluene, it is important to know whether the toluene is contaminated with benzene and the contamination percentage.

**Health and Safety Guide
For Women**



A new LOHP publication entitled *Working For Your Life: A Woman's Guide To Job Health Hazards*, is now available. Written by Andrea Hricko, the Guide's purpose is to educate women workers about hazards and discrimination that they may face on their jobs. The Guide explores hazards encountered in occupations which employ large numbers of women workers, i.e., clerical; textile and apparel; hairdressers; launderers and dry-cleaners; electronics; meatwrappers; and hospital and laboratory workers.

The Guide also covers those hazards which may adversely affect the offspring of exposed workers, i.e., lead; estrogen; radiation; mercury; anesthetic gases; and others.

Individual copies may be obtained for \$5.00 (Institutional rate, \$8.00). Mail request with remittance to LOHP, 2521 Channing Way, Berkeley, Calif. 94720.

British Text on Work Hazards

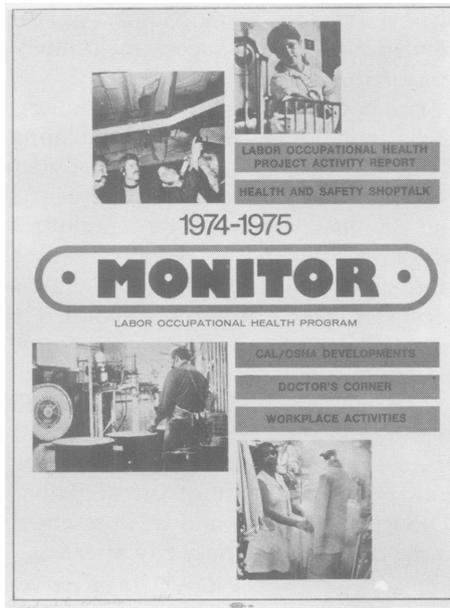
Another fine textbook on health hazards. *Hazards of Work: How to Fight Them* by Patrick Kinnersley (Pluto Press, London, 1973) also contains useful shop floor tactics although the legal information is based on English law. Order this book from Sun Distribution International, 14131 Woodward, Highland Park, Michigan 48203. \$2.25 plus postage.

Genetic Hazards of Work

Occupational Monitoring for Genetic Hazards marks the first attempt to focus on the concerns and problems of the occupational environment as related to mutagenic compounds and their extension into the general environment. Of particular concern to the authors are existing and proposed screening techniques, the relation of animal and cellular studies to possible human mutagenicity, the identification of potential mutagenic compounds for testing, and the participation of labor and management for long-term testing.

This publication is available from: The New York Academy of Sciences, P.O. Box 5075, F. D. R. Station, New York, NY 10022. The costs are \$8.00 plus \$1.00 for mailing and handling charges.

**Back Issues of LOHP Monitors
Now Available**



Bound copies of the 1974-75 *Monitor* are now available and may be ordered from the Labor Occupational Health program, 2521 Channing Way, Berkeley, CA 94720. The cost is \$3.00 per set. Special features include: occupational cancer; hazards of sulfur dioxide, vinyl chloride and carbon monoxide; occupational dermatoses; CAL/OSHA developments, and health and safety committee activities.

Health and Safety Library Materials

Materials helpful for setting up an occupational safety and health library and learning more about occupational safety and health's relationship to health

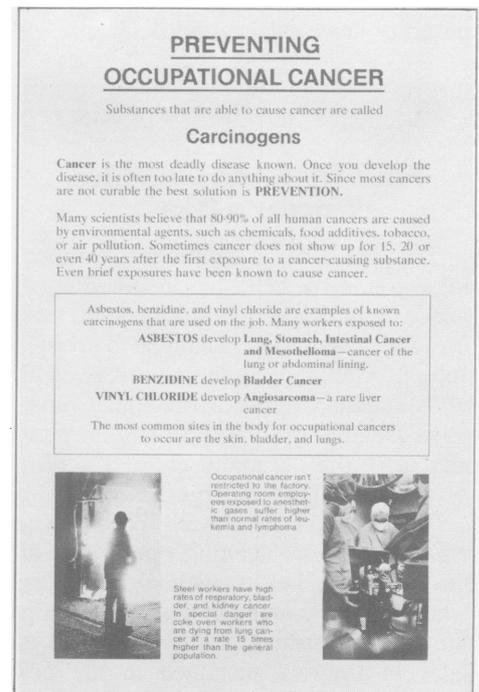
care are now available: Guide #1—setting up a local union occupational safety and health library (25¢); Guide #2—Occupational Health Services (25¢); Guide #3—an occupational safety and health bibliography (25¢); Guide #4—planning for occupational safety and health with Health Systems Agencies (50¢); CCAHS Quarterly—OSHA and Health Care (50¢); and CCAHS Quarterly—Cancer and Jobs (25¢).

To order any of the above, write: Labor Safety and Health Institute, 381 Park Avenue South, New York, N.Y. 10016 (212-689-8959).

Meat Cutters Produce Safety Film

A training film alerting meat workers to on-the-job health and safety hazards is now available. The 16 mm color sound film, "I Never Had An Accident In My . . ." can be bought at \$75.75 per print or rented at \$10.00, from the National Audiovisual Center, (GSA), Washington, D.C. 20409. An instructor's guide is included. The film can also be borrowed from Local 342, 186-18 Hillside Avenue, Jamaica, New York 11432.

Occupational Cancer Pamphlet



Preventing Occupational Cancer is a new pamphlet published by LOHP. It contains basic information on occupational carcinogens, current regulations, methods of prevention, and a discussion of the use-permit concept. Single copies may be obtained for 50¢. Request copies from: Labor Occupational Health Program, 2521 Channing Way, Berkeley, California 94720.



Photos by Boris Yaro and Ralph L. Emerson

Nine Los Angeles city firefighters were injured trying to rescue crew members when a DC-6 crash-landed on a Van Nuys city golf course on February 8, 1976. To prevent a flash fire, alerted firefighters began applying "Light Water" aqueous film foam to the spilled fuel. Teams of firefighters walked through the foam and gasoline searching for survivors. To get to the three apparently dead crew members, firefighters tried to saw through the crushed cockpit with a rotary saw and Hurst Power Tool. A fire sparked and spread after a series of flashes, trapping nearly two dozen firefighters. The blaze was finally extinguished by applying more foam.

Los Angeles Fire Chief Kenneth Long said preliminary indications were that the blaze was caused by sparks from the saw hitting steel: "I think we shall learn

a lot from this crash fire, and so will other fire departments. Next time I'm sure we'll pour a spray directly onto the saw cut to damp out sparks."

The firefighter casualties reactivated an issue that's been argued for several years—the lack of safety standards for firefighters' clothing. Ralph Travis, a city fire inspector and head of the Health and Safety Division of the United Firefighters of Los Angeles, Local 112, said that just the Friday before the crash he had submitted a 108-page proposal on firefighters' clothing to the California State Legislative Select Committee on Fire Service. He refused to comment specifically on the February 8th fire, except to say the firefighters' clothing was inadequate as it had generally been all along.

—Los Angeles Firefighter

Published monthly by the Labor Occupational Health Program, Institute of Industrial Relations, University of California, 2521 Channing Way, Berkeley, California 94720. (415) 642-5507

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Annual subscription rates: Organizations and Institutions — \$10.00, Individuals — \$3.00. Quantity shipments are also available to union locals or other groups at a cost of 5¢ per copy per issue, with an annual subscription.

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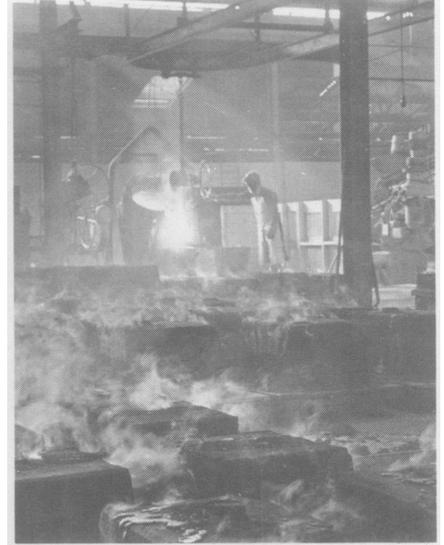
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