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safety standards

May-June 1972 Vol. 21 No. 3
U.S. DEPARTMENT OF LABOR
Occupational Safety and
Health Administration

Target Health Hazards

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The Quality of the Work Environment

Human history has been defined as a record of man's attempts to master his environment. The struggle began early, with primitive man's attempts to control conditions he did not create and could not comprehend. The attempt to control environment continues today and is no less desperate in that the forces man seeks to understand and direct are largely of his own making.

A separate chapter in man's attempt to control the conditions of his life began about a century ago when a new social awareness focused on the need to improve working conditions. A century of progress, though often slow and halting, has taken us closer to the goal of providing decent conditions of employment for working men and women.

The Occupational Safety and Health Act of 1970, with its purpose of assuring "safe and healthful working conditions for working men and women," takes us a step further. Literally, the Act means that no employee must risk death, injury or illness to do his job. But the Act is rooted in a tradition that has aimed not just to establish decent working conditions but to make the work environment liveable—to humanize it.

This is a goal that cannot be won in a short time, nor can it be won by the few for the many. The renewed struggle for safe and healthful working conditions must be a common endeavor, involving every working man and woman, every employer, every union member, every state and federal government official.

Focusing upon the need to create healthful working conditions, the Occupational Safety and Health Administration, in January 1972, initiated the Target Health Hazards Program. The emphasis is on five hazardous workplace substances—asbestos, lead, silica, cotton dust and carbon monoxide. The approach is the ancient one—first to understand the exact nature of the dangers, then to control, and finally to prevent them. It is an objective within reach, for occupational diseases can be prevented.

It has been said that the Target Health Hazards represent only "the tip of the iceberg." That well may be. If so, what more logical place to begin?

This issue of Safety Standards magazine begins a series of articles on the Target Health Hazards, with asbestos as the first topic. Once highly regarded as a mineral with remarkable qualities, asbestos is now widely recognized as one of the most hazardous of air contaminants.

Asbestos workers and the general public share the common danger. That the workplace and the environment in general do not always divide into separate compartments may be seen by glancing at the back cover. The photo shows asbestos insulation being sprayed on the steel girders of a building under construction. But 25 percent of asbestos spray enters the atmosphere—a threat to other construction workers and to the community. Reducing the risks of asbestos will benefit not only employees but also society in general. It is an instance where improving the work environment and improving the quality of life come together.

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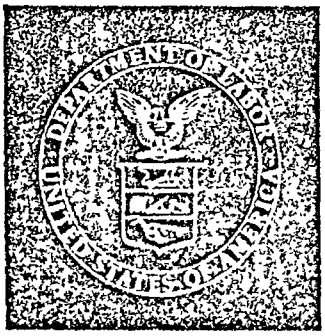
SAFETY STANDARDS is the official bi-monthly magazine of the Occupational Safety and Health Administration, U.S. Department of Labor. It is available by subscription at $1.00 a year ($1.25 for foreign addresses); 20 cents a single copy from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Expressions of opinions in articles outside the U.S. Department of Labor do not necessarily represent the views of the Department. Use of funds for printing this publication approved by the Director of the Bureau of the Budget, February 5, 1968.

Change of Address: Write to Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

Front cover: In recent years asbestos has been recognized as one of the most dangerous contaminants in the workplace. The asbestos worker on the front cover empties a bag of asbestos mix into a container and raises a cloud of asbestos dust that endangers others on the worksite.

Picture Credits:
Environmental Control and Safety Management
Insulation Industry Hygiene Research Program, Environmental Science Laboratory, Mount Sinai School of Medicine
Library of Congress
National Institute of Occupational Safety and Health
Plasterers' and Cement Masons' International Association of the United States and Canada
Power Systems, Inc.
Smithsonian Institution
U.S. Department of Labor

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safety standards

Vol. 21 No. 3 May–June 1972
UNITED STATES DEPARTMENT OF LABOR
Occupational Safety and Health Administration

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Target Health Hazards

Asbestos: Airborne Danger

by Nancy L. Nelson

Two thousand years ago when the first use of asbestos was recorded, it was a sacred object, a curiosity of kings and nobles, a magic mineral. The Greeks, who used asbestos for the wicks of their temple lamps, were enthralled when flames did not consume it, but burned unceasingly. Amazed, they called it *asbesta*, which meant the "unquenchable," the "inextinguishable."

Now that asbestos has been integrated into our industrial world—from fireproof drapery and floor tiles to the corrugated steel used in heavy construction—the term used by the Greeks has been found to apply to another attribute of this mineral. No cure now exists for the diseases caused by inhaling asbestos fibers: once established, these disorders, too, have so far proved to be inextinguishable.

In the last few years, asbestos has been recognized as one of the most hazardous of air contaminants in the workplace. Employees exposed to asbestos include an estimated 100,000 insulation workers, 50,000 workers in manufacturing products, 60,000 using end products, and uncounted thousands in construction. Labor unions have pushed for stricter standards governing its usage, and the Occupational Safety and Health Administration has listed it as one of five target health hazards in a new program aimed to crack down on health hazards in the workplace.

Recent studies, such as those conducted by the Mount Sinai School of Medicine and the National Research Council, have produced some disturbing statistics on the mortality rates of workers using asbestos. Dr. Irving J. Selikoff of the Mount Sinai School of Medicine discussed the implications of these studies: "At present, one in every five deaths among insulation workers is due to lung cancer, one in ten to cancer of the pleura or peritoneum, one in ten to scarred lungs of asbestosis." Since insulation workers receive relatively light exposures to asbestos compared to some other occupational groups, these results are even more sombre.

What disturbs researchers about diseases linked to asbestos is that many cases they are presently encountering result from exposures dating back to the 1930's, when asbestos was not used as extensively as it is today. Thirty years ago world production was approximately 50,000 tons annually; today it has skyrocketed to 3 million tons. The effects of exposures occuring in the 1970's probably

Miss Nelson is the assistant editor of SAFETY STANDARDS.

will not be known until the end of the century; but the high mortality rates of today suggest what may be expected in the future. If working conditions are not significantly altered, asbestos exposure can lead to 17,000 deaths from lung cancer, 10,000 deaths from cancer of the pleura and peritoneum, and 10,000 deaths from asbestosis, according to projections by Dr. E. Cuyler Hammond of the American Cancer Society.

The first case of asbestosis did not come under medical attention until 1900, 22 years after asbestos was mined on a large-scale basis. The victim, a British textile worker, had inhaled the asbestos dust stirred up by the carding machine he had operated for 14 years. Ten other men had been his co-workers in the carding room. All died before their thirtieth birthdays.

Since the recognition of asbestosis 72 years ago, the disease has been widely studied the world over, from the mines of South Africa to the mills of Quebec. Today experts believe that asbestosis is one of the most debilitating of the pneumoconioses—lung diseases caused by dust inhalation. Erupting 20 to 30 years after the exposure period, the disease exhibits no warning symptoms to mark its early stages. Many studies have uncovered cases of the disease in which the exposure was relatively light and did not continue over an extended period of time.

Although four varieties of asbestos are used commercially, chrysotile asbestos, mined primarily in Quebec, accounts for 95 percent of world production. Under high magnification, chrysotile fibers resemble fine polished wire or strands of silk. Strong, soft and flexible, they can be woven into fabric.

Chrysotile, however, is dangerous medically. When inhaled, the needle-like fibers become trapped in the lower bronchioles of the lungs. Normally, protective cells called phagocytes destroy



The asbestos worker mixing cement is partially protected by a respirator. The asbestos fibers in the air, however, endanger his fellow employees, just as his dust-laden clothes are a menace to his family. New OSHA standard requires that asbestos materials be mixed in closed containers.

"The effects of exposures occurring in the 1970's probably will not be known until the end of the century; but the high mortality rates of today suggest what may be expected in the future."

such irritants. But asbestos fibers are indestructible in lung tissue. The phagocytes form a heavy coating around the fibers. In time, a dumb-bell shaped structure known as a ferruginous body begins to form.

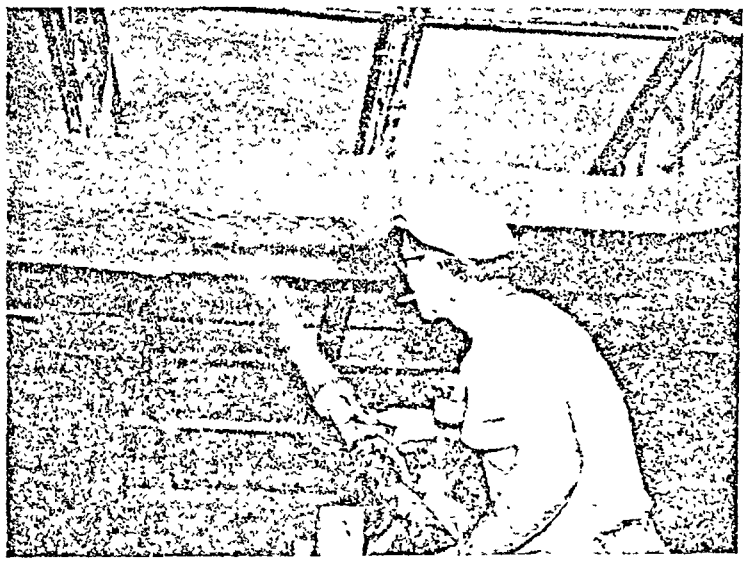
Asbestosis develops when the scar tissue that forms around asbestos fibers slowly spreads throughout the lung and pulls it out of shape. The working space for air exchange is reduced, and blood flowing through the lungs is not replenished with a sufficient amount of oxygen. Breathlessness becomes pronounced, and in advanced stages can be disabling. Other symptoms are loss of weight, coughing, weakness, and pain in the chest or between the shoulders. The strain on the heart caused by the lack of oxygen may cause heart failure.

Recent studies indicate that asbestos also may be a potent carcinogenic, or cancer-producing agent. A major stumbling block to researchers in establishing the connection between asbestos and cancer has been the length of time between exposure to the substance and the appearance of cancer symptoms. But in the last few years, studies have shown that workers exposed to asbestos die of lung cancer at more than five times the expected rate. Although most cancers linked to asbestos develop in the lower portions of the lungs, where the concentration of fibers is heaviest, cancer may also develop in the gastrointestinal tract.

The peril of lung cancer from asbestos exposure is increased by smoking. Tests conducted by Selikoff and Hammond have shown that asbestos insulation workers who smoke have 90 times the incidence of lung cancer compared to smokers with no asbestos exposure.

Mesothelioma, formerly a rare cancer afflicting only one out of 10,000 people, is now appearing at an unprecedented rate. Researchers are linking it to asbestos exposure, however slight. This fatal cancer attacks the pleura (the membrane lining the lung and chest cavity) or the peritoneum (the lining of the abdominal cavity). In his study, Selikoff noted that 10 out of 124 deaths of insulation workers were caused by mesothelioma.

Workers in many occupations encounter serious asbestos exposures. Among the establishments most likely to have asbestos risks are those manufacturing asbestos textiles, value packings, asbestos



Wrong: Spraying asbestos mixtures on steel girders releases vast amounts of asbestos dust into the atmosphere. Asbestos insulators who smoke have 90 times more lung cancer than smokers with no asbestos exposure.

"Since the recognition of asbestosis 72 years ago, the disease has been widely studied the world over, from the mines of South Africa to the mills of Quebec. Today experts believe that asbestosis is one of the most debilitating of the pneumoconioses—lung diseases caused by dust inhalation."

sheets, brake linings, boiler blankets, building materials and appliance cords.

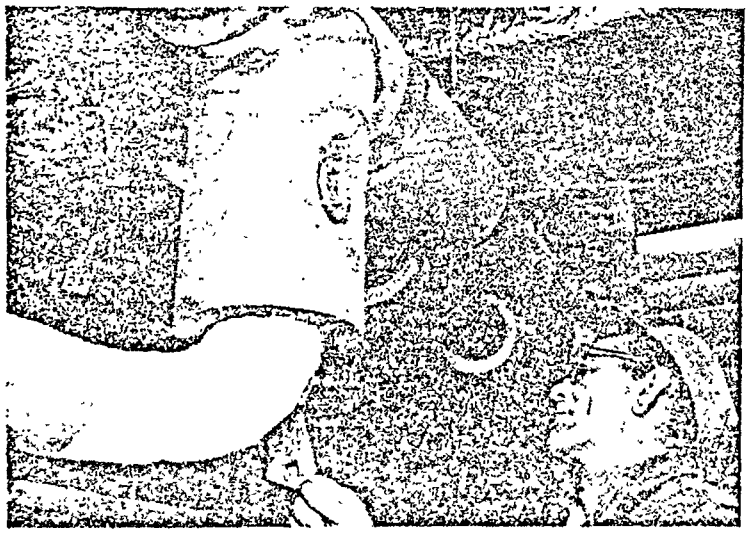
Plasterers who spray an asbestos mix on the steel foundations of buildings have heavy exposures to asbestos. A thermal insulation and fireproofing agent, the asbestos mix prevents the steel from buckling in case of fire. Plasterers can apply it without interrupting construction activities, and the asbestos mixture hardens in eight hours without cracking or shrinking. Not only steel buildings, but ships and boats are treated in this manner.

Now that asbestos has been recognized as a major health hazard, the alarming facts about this practice are being reviewed. Three million pounds of the fireproofing mixture, 30 percent of which is chrysotile asbestos, was sprayed in 1970. Twenty-five percent of the material sprayed does not adhere to the steel, but goes directly into the atmosphere. The plasterers manning the spray guns, as well as the construction workers toiling near-by, inhale excessive amounts of asbestos during this operation—up to 50 million fibers in an eight hour day. But the hazard does not end with contruction. A large amount of asbestos is expected to be set free during demolition of the buildings and ships treated in this manner.

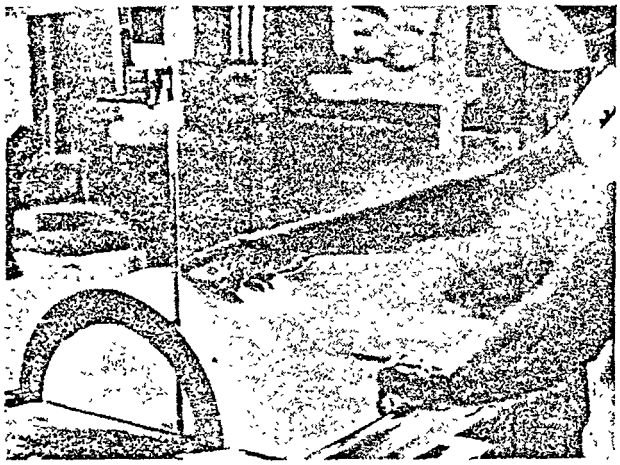
Asbestos spraying has been banned in some cities, but continues unabated in others. The use of alternate methods of application—trowelling a wet mixture of asbestos on the foundation or wrapping insulation around the steel in the form of blankets—is being encouraged to reduce the hazard.

Brake mechanics must also cope with significant levels of airborne asbestos. Valuable because of its resistance to heat and its ability to withstand abrasive force, chrysotile asbestos makes up 50 percent of brake lining material. However, the friction breaks asbestos fibers away from the fabric. Many mechanics remove the asbestos fibers that have accumulated around the brake drums and assemblies with a compressed air hose. This produces a cloud of asbestos dust around the mechanic and anyone in his working area. Alternate cleaning methods are needed; for example, a vacuum cleaning device reduced the hazard in recent tests in England.

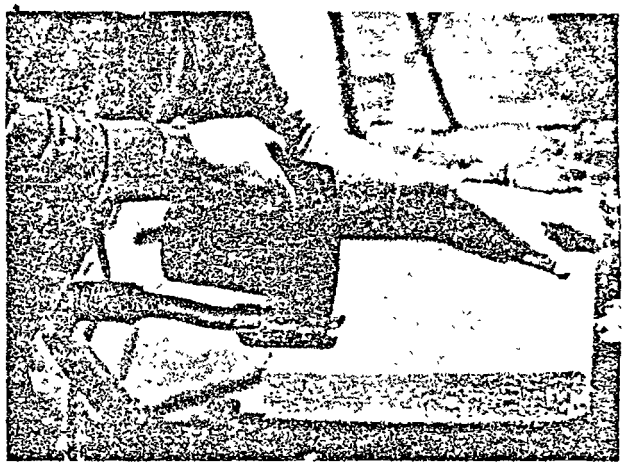
Insulation workers are the largest single occupational group to handle asbestos on the job. Their



Right: Troweling a wet asbestos mix on pipes for insulation purposes effectively reduces the hazards.



Wrong: Sawing asbestos materials creates dust in the work environment. The respirator affords the employee some protection, but the accumulation of dust remains a threat to others on the worksite.



Right: A saw with a local ventilation system sucks up asbestos dust into a container. The OSHA standard specifies that hand or power-operated tools that produce asbestos dust must be equipped with local exhaust ventilation and dust collectors.

exposures, however, are relatively light. In most types of insulation, asbestos is used primarily as a binding agent and makes up only 15 percent of the material. Then, too, insulators working with asbestos on a daily basis are encouraged to take precautions: good housekeeping measures, tools equipped with local ventilation systems, and respirators for dusty work are safety precautions stressed by their union.

When insulation workers install materials containing a high percentage of asbestos, they often use a water spray on the cloth while unrolling it or uncovering it. Some insulation workers even cut asbestos on disposable tarpaulins in order to allow the excess material to be discarded without stirring up dust. This eliminates the need to sweep up insulation debris after a job. Usually a dusty process, sweeping is discouraged because it holds a risk for the workers still on the construction site.

Bricklayers, carpenters, sheet metal workers and boiler makers also install insulation at various times, but often they fail to take the precautions used by workers who handle asbestos on a daily basis. The licensing of workers who install insulation, much like the licensing of plumbers and electricians, has been suggested as a safeguard to insure that asbestos handlers are both informed and equipped to work safely.

Asbestos contamination holds an increasing threat to the general public. Both the dusty manufacturing processes and the spraying of structural steel emit vast amounts of asbestos fibers into the atmosphere, threatening those living near asbestos factories. Unsuspecting passers-by in the vicinity of construction sites or families of workers who return home with dusty clothing are among those exposed to this hazard.

The emergency OSHA standard for asbestos, issued on December 7, 1971, lowers the permissible concentration of asbestos fibers in the work atmosphere from 12 fibers to five fibers greater than five microns in length per milliliter. This is based on the average exposure during the eight-hour work day. Concentrations of asbestos that range from five fibers per milliliter to 10 are permissible for 15 minutes every hour, but the sum total of such exposure must not exceed five hours in an eight-hour work day.

The standard also lists engineering controls—enclosures, vacuum sweeping and local exhaust ventilation. When these measures are not feasible or do not reduce the asbestos concentration to permissible levels, the standard requires that workers be provided with personal protective devices. Protective respiratory devices must be worn by workers exposed to the spraying of asbestos, or

to the demolition of pipes, structures or equipment previously sprayed with asbestos.

The emergency standard requires that the employer check the respiratory devices for proper fit and train employees in their correct use. Periodic inspections, proper cleaning, repairing and storing of the respiratory devices are responsibilities of the employer.

The standard also specifies that hand or power-operated tools that produce asbestos dust—saws, scorers, abrasive wheels, and drills—must be equipped with local exhaust ventilation and dust collectors. When asbestos is mixed with other products—such as cement, mortar, grout or plastic—the mixing must be done in closed containers. Cleaning up the debris by dry sweeping or blowing it away is prohibited. Any accumulation of asbestos dust must be removed rapidly by vacuum cleaners. Asbestos waste must be disposed of in sealed containers.

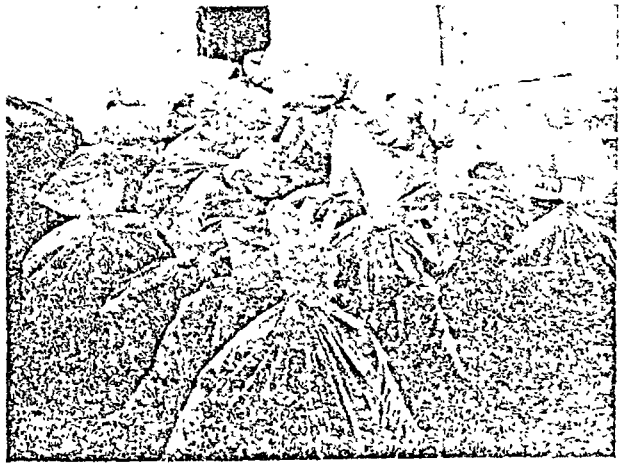
The OSHA Standards Advisory Committee for Asbestos has recommended an exposure limit of two fibers greater than 5 microns in length per cubic centimeter. This proposal, based on a NIOSH criteria document, would not be effective for two years, in order to allow the installation of the necessary engineering controls. The committee, representing government, labor and industry, also suggested that the future standard include a program of comprehensive medical surveillance requiring pre-employment medical examinations of applicants, periodic medical evaluations of workers, and medical records to be kept by employers for the use of OSHA and NIOSH.

The research and mortality studies of today have tarnished the reputation of this magic mineral, once the object of fabulous tales. One legend revolves around the tablecloth of Charlemagne, the eighth-century ruler of the Holy Roman Empire. When the cloth woven from asbestos fibers was thrown into the flames, it was withdrawn not only intact, but whiter and cleaner than before. Charlemagne used this piece of "witchcraft" to mystify his guests as well as to intimidate his enemies in order to win psychological battles.

The jump from ancient legend to contemporary knowledge about asbestos is a tremendous advance—except in one area. Our ability to combat the disasterous effects of asbestos on the human system is still negligible. The mystery surrounding asbestos continues today, but the price is not in lost battles but in lost working lives. □



Wrong: Asbestos dust collects with other debris on a construction site. The cleaning and sweeping process raises clouds of asbestos dust, endangering the employees and the community.



Right: The new OSHA standard requires that asbestos debris be removed in closed containers or plastic bags.



• Careers in Safety and Health:

PROSPECTS BRIGHT IN OCCUPATIONAL NURSING

by Virginia Reinhart

"For the first time there is a federal law stating that no worker's life should be shortened, endangered or lost because of hazards in his work environment. In the next few years there will be a growing need for occupational nurses and expanded opportunities for those in the field."

Mary Louise Brown, chief of Occupational Health Nurse Training of the United States Public Health Service, thus explains the impact the Occupational Safety and Health Act of 1970 will have on the nursing profession.

Today there are more than 20,000 nurses in factories, office buildings and stores. Businessmen have found that nurses can save the company money as well as improve the morale of employees. Such preventive measures as flu shots, paid for by the company and administered by the nurse, reduce illnesses and absenteeism, saving companies large sums of money in compensation.

Since 60 percent of all employee complaints about working conditions involve health factors, more employers are becoming aware of the need to improve existing health facilities or to create health centers where none exist. A health center can be a small room where a first-aid expert keeps basic medical supplies. More often it is an office where a registered nurse attends to accidents, plans immunization programs, keeps absenteeism statistics, selects safety and health films to show workers, and does a dozen different kinds of nursing each day.

Unlike hospital nurses whose job is caring for the sick, the occupational nurse spends most of her time preventing illness. This emphasis on prevention is not new. Florence Nightingale expressed it when she said, "Nursing is not only a service to the sick; it is a service also to the well. We have to teach people how to live."

The first occupational nurse in the United States was hired specifically to "teach people how to live." In 1895 the Vermont Marble Company in Proctor, Vermont, hired Ada Mayo Stewart to give home nursing services to employees and their families. Her job was to visit employees' homes, to attend any sick members and to teach health to school children.

Occupational nurses today work at the employment site, leaving Ada Stewart's tasks to visiting nurses and school nurses. But they are still actively engaged in teaching people how to live. Because modern man spends nearly a third of his life on the job, the occupational nurse now brings health services to him where he works.

A visit to an occupational nurse shows the kinds of health services she provides and how preventive

Mrs. Reinhart is a free-lance writer.

medicine works. Mrs. S. is the supervisor of an infirmary that serves more than 4,000 employees, all of them office workers except for the maintenance staff. The infirmary is beside the elevator, which can save precious time in case of an emergency. The walls are covered with posters urging workers to take a glaucoma test, telling when and where immunization shots will be given, and warning "Drugs Are a Bad Scene."

A plump young typist enters with a bleeding finger, cut on an envelope. Mrs. S. cleans and bandages the finger, and asks the girl how her dieting is going. The girl groans that it's not going well at all, and Mrs. S. urges her not to give up. Earlier in the year the typist had participated in a glucose tolerance test to detect diabetes. When she tested high, the nurse had given her the diet prescribed for potential diabetics. Mrs. S.'s care of the finger is first aid; her inquiry about the diet is preventive medicine.

An older man comes in with a headache. Mrs. S. greets him by name, talks briefly, and gives him aspirin. She explains, "If this man came to me often with headaches, I'd refer him to the doctor who works here half-time. It would be dangerous to ignore symptoms like regular headaches." Deciding when a headache is a headache and when it is the signal of a more serious illness is typical of the responsibility an occupational nurse carries.

Three women enter to weigh themselves. One decides to sign up for a test to detect cervical cancer. Mrs. S. notes that two of the women are overweight. "Lots of our girls are overweight. Sitting at a desk all day, plus the coffee breaks, doesn't help. We are trying to arrange a 10-minute-a-day fitness program during one break. If management can find us a room and if the employees are willing to give up their break, perhaps we can help them stay away from the vending machines."

An older woman executive comes to the nurse to have her blood pressure checked. Because she suffers from hypertension, her family doctor had asked the health office to check it each week. Today she is fine, but if her pressure were high, the nurse would notify the family doctor. The infirmary also gives allergy shots at the instruction of private physicians. This cooperation between private doctors and the occupational health service profits everyone. It saves the time of the private doctor, who already is overworked; it saves the time of the worker, who can leave his desk for a short time; and it reduces employers costs for sick pay, compensation and lost production.

An elevator operator needs some kaopectate, a secretary wants the address of a dental clinic, a young man comes in to discuss a personal problem. None of these is an industrial accident case, but each is a matter of employee health. So is the campaign Mrs. S. started to provide a kidney machine for a ghetto clinic, and the posters she hung giving the address of the nearest VD clinic. Mrs. S. has given emergency care to a cardiac attack patient; she is prepared to handle an epidemic of mass food poisoning—which she hopes never happens; and she can help an employee find mental health counseling, which she often does. Those outside the profession think giving first aid is the only task of the occupational nurse. It's not even half of it.

Another nurse at a large printing and engraving plant is part of a safety and health team that has four nurses, a full-time doctor and a safety officer working to eliminate accidents and to cope with any that occur. Because of the many hazards—huge presses, chemical shops, flammable materials, constant moving of heavy loads—this establishment seems to have most of the potential dangers an industrial society can offer in one workplace. Accordingly, the safety and health team emphasizes prevention. Every employee gets a pre-em-



"Businessmen have found that nurses can save the company money as well as improve the morale of employees. Such preventive measures as flu shots, paid for by the company and administered by the nurse, cut back on illnesses and absenteeism, saving companies large sums of money in compensation."

ployment physical which includes specific tests for particular jobs. For example, the doctor and nurse measure the amount of energy a worker uses to move heavy drums onto dollies. The test helps determine whether the man is strong enough to move heavy drums all day long. By this test they can prevent weaker men from taking the job and later developing back ailments and/or hernias.

The nurse assists the doctor with the medical examinations, writes up the medical histories, and follows up on any referrals the doctor may make. When the plant doctor sent a security guard to the hospital with a heart condition, the nurse was informed. When the man returns to the job, she will check with his family doctor about restrictions on his activities and whether he needs medication.

Miss A., one of the plant nurses, explains, "Some of our employees would not go to an eye doctor for glasses if we didn't check back after they had taken our eye test. Things like faulty vision can cause accidents." "Checking back" is another form of preventive medicine.

Because this plant uses lead in some of its ink manufacturing processes, the medical team runs a special blood test for lead. This routine procedure for men in that department prevents permanent damage to their health. If the level of lead in their blood becomes too high, they are removed to another department.

The health team is also assisting the National Institute of Health by collecting data on cholesterol from workers who volunteer. Employees throughout the nation, as well as prisoners in jails, have helped medical research projects in this way.

The nursing staff of a large department store has one nurse who works in all its suburban branch stores, visiting each one in turn. She tries to get a medical history of each new employee. Since there is no regular nurse on duty daily, she sets up a first-aid station in each store. On each visit, she checks to see that the kit is complete.

Many industries are like the suburban department stores—too small to need a full-time nurse or doctor. It is possible to hire medical help on a part-time basis, or to join with other establishments to create a joint health service. In suburban Washington, a publishing company and a nearby printing plant share the services of a nurse.

Any registered nurse can become an occupational nurse. There is no special educational program, but they usually must update their skills and learn new treatments. The chief difficulty in providing this in-service education to working occupational nurses is explained by Miss Brown of the Public Health Service:

"Since 80 percent of the occupational health nursing positions are on staffs of five or fewer nurses, and these are considered to be too small to have an organized in-service educational program, such a program has to be developed and conducted by an agency other than the nurse's employer."

To meet this need for more training, the Industrial Health Foundation and the National Institute for Occupational Safety and Health (NIOSH) have set up courses for industrial nurses.

In 1971 NIOSH offered a one-week course, Fundamentals of Occupational Health Nursing Practice, in six cities. Nurses studied legal aspects of occupational health nursing; workmen's compensation; the Occupational Safety and Health Act; records and reports; relationship of the nurse with management, employees, physicians, safety engineers and industrial hygienists; and the nursing responsibilities associated with giving care to employees. They were given a study assignment to be done at home. Several weeks later they returned for a seminar to discuss their assignments.

A second course, Nursing Practices and Occupational Mental Health, covers personality development, crisis intervention, suicide, drugs and alcoholism. This course concentrates on interviewing and counseling techniques.

The Industrial Health Foundation also offers occupational nurses a course in Mental Health Training. This is a home-study program in which the student reads the material, takes the tests, then checks her own work. If she has made too many

errors, she repeats the sections before continuing to the next chapter.

As Miss Brown reports, "This approach offers an avenue to close the gap between the need for training and the absence of opportunities to learn. It makes possible learning at home at the student's own pace—and for some married women, and certain occupational health nurses who work as their company's only nurses, it may be the only way."

More information on courses on occupational nursing can be obtained by writing to: Division of Training, National Institute for Occupational Safety and Health, 1014 Broadway, Cincinnati, Ohio 45202; or Industrial Health Foundation, 5231 Center Avenue, Pittsburgh, Pennsylvania 15232.

Two of these three courses deal with mental health—the new emphasis in occupational nursing. There is strong evidence for the need of such training. In 1962 a Cornell University study estimated that mental illness cost industry approximately $3 billion a year in direct and $12 billion in indirect costs. This study estimated that 20 to 25 percent of the work force has a recognizable mental health problem. Social Security data for the same period showed that 30 percent of all disability allowances to covered workers were made for mental, psychoneurotic, and personality disorders.



NIOSH has recognized the need for more research on the effects of stress situations on the worker's mental health and on his job safety record. Long-range projects funded by NIOSH will gather data on such topics as the effects on workers of noise, frequent changes of work shifts, long-term vigils, monotony and rapid geographic relocation. Another study, still in the planning stage, will be to devise a model safety program based on accepted psychological, behavioral and motivational principles.

The shortage of doctors, coupled with the increase in population and the greater demand for medical services, has led the medical profession to take a closer look at the work nurses can do. For years dentists have employed dental assistants to relieve their work load. Now the American Medical Association (AMA) has begun to develop a similar new profession—the physician's assistant. Dr. Walter C. Bornemeir, president of the AMA, has cited two sources for these assistants—medics from the armed services and registered nurses.

The special training a nurse would take to become a physician's assistant would qualify her to give physical examinations in many occupational health centers. The New York Telephone Company already has begun a program to prepare nurses to give physicals. The Nurse Clinician Program, a course developed by the State University of New York Downstate Medical Center, has been so successful in preparing nurses to perform this function that it is now an established part of the company's medical program. New York Telephone's doctors are now free to use their skills in diagnosis and treatment, and their nurses get new opportunities for advancement.

The outlook for occupational nursing is bright. As the drive for job safety and health gathers momentum, the need for occupational nurses will increase. There will be more on-the-job training, as well as more opportunities to learn a specialty and rise in the profession.

A British physician summed up the challenge of occupational nursing when he referred to it as "the easiest job in the nursing profession to do badly—and one of the hardest and most satisfying to do well." □

POINT OF VIEW



Marcus M. Key, Director



Edward J. Baier, Deputy Director

National Institute for Occupational Safety and Health

Commenting on the achievements of the National Institute for Occupational Safety and Health (NIOSH) of the Department of Health, Education, and Welfare, Representative William Steiger, co-author of the Occupational Safety and Health Act of 1970, stated: "Their efforts are providing a solid foundation for the health aspect of the Act. I have said on many occasions that health in the long run would be most important . . . but let us recognize that it is the more technical, more complicated part of an inseparable whole."

The officials responsible for guiding the NIOSH campaign to control health hazards in workplaces are Dr. Marcus M. Key, Director of the Institute, and his newly appointed Deputy Director, Edward J. Baier. In a recent interview, they discussed current NIOSH aims as well as future directions in occupational health.

Q. *NIOSH has many responsibilities under the Occupational Safety and Health Act: research, training, criteria development and hazard evaluations. What functions do you consider the most pressing in the first year of NIOSH's existence?*

Key. At present we have internal priorities and external priorities to consider during the first year. By internal I mean responsibilities for getting organized—staffing up and finding facilities suitable for research. The external responsibilies—those dealing with the outside world—are developing criteria for standards, initiating the National Health Hazards Survey and training an adequate supply of manpower.

Q. *What exactly is NIOSH's role in standards development?*

Key. We don't turn out standards ourselves—we turn out criteria documents. The criteria package on asbestos was the first example. The Department of Labor sets the standard based on the health criteria that NIOSH provides and on other available information.

There are four considerations in setting standards. These four are health effects, feasibility, economic impact and national interest. On the HEW side, we consider the health effects of the exposure and as much feasibility information—the practicalities involved in controlling the exposure—as we have available. Then we rely on the Department of Labor to add the other considerations and to make a final determination.

NIOSH has committed itself to develop criteria packages for specific chemical substances and physical agents that are hazardous. Unfortunately, we have had difficulty in meeting our proposed deadlines for criteria packages this year, primarily because we haven't had the resources. In staffing the Institute, we have been hindered by employment ceilings and average grade controls, and only recently have we been allowed to start recruiting professionals again.

Q. *You mentioned that the second major priority is the National Health Hazards Survey. What kind of information will this investigation provide?*

Dr. Key and Mr. Baier were interviewed by Nancy L. Nelson, assistant editor of SAFETY STANDARDS.

Key. The need for the National Health Hazards Survey was brought out repeatedly during the hearings that led to the passage of the Occupational Safety and Health Act of 1970. At that time we were able to talk about the 14,000 deaths and the 2.2 million disabling injuries resulting from work accidents. These events can be measured—they are dramatic. But on the health side, we really didn't know how many occupational diseases there were, nor did we know what the health hazards were that produced these diseases.

Eventually NIOSH will be provided with statistics on occupational diseases by the Occupational Illness and Injury Reporting system operated by the Bureau of Labor Statistics. But we still won't have a good idea of what the health hazards are that produce occupational diseases—a gap that the survey is designed to fill.

Baier. The investigators for the National Health Hazards Survey are going to define for us what occupational groups have potentially dangerous exposures. We don't have this information at the present time. If you asked how many people in the United States are potentially exposed to lead fumes, we couldn't answer that because we just don't know. While some electricians who solder wires are exposed to lead, other workers who burn massive amounts of lead pigs have even greater exposures. One worker is dealing with ounces of lead, and the other is dealing with tons. So it's not only exposure to a substance, but to how much of it that counts.

Some of the exposures are shocking because they are so unexpected. You don't even realize that some workers come in contact with hazardous substances, because you would never suspect that their jobs involve dangerous exposures.

Q. *How were the industries to be investigated by the health hazard surveyors selected?*

Key. The Bureau of Labor Statistics has given us a sample of approximately 8,000 representative industries. The surveyors are going to conduct thorough walk-through examinations of the industries in the sample, investigating them from the viewpoint of an industrial hygienist. The results of the survey will provide the basis for determining the potential exposure to health hazards in the nation as a whole. For the first time, NIOSH will be able to determine which hazards really need more attention.

Baier. A primary concern of the surveyors will be the hazards associated with the occupation itself. One example might be a plant that has a degreaser, a tank containing a solvent used to remove grease from objects. When you consider hazards associated with the degreaser, you generally think in terms of the degreaser operator and whether or not the degreaser is adequately controlled by covers and ventilation systems to prevent exposure. But then you discover that machinists who work all over the plant periodically come in, dip something into the degreaser and carry it back to their worksites. So if you are looking at occupations, you say this fellow is a degreaser operator; therefore, he is exposed to trichloroethylene. But if you investigate further, you discover that machinists also are exposed to trichloroethylene and probably have more serious exposures than the degreaser operators. So you see, the National Health Hazards Survey is identifying the health hazards that workers in different types of occupations are exposed to, as well as the degree of that exposure.

Q. *Surveys of this kind always require the skill of professionals, but I understand there is a tremendous manpower shortage. Just how crucial is the shortage and what is its effect on health conditions?*

Key. I think it is elementary that if you don't have qualified personnel—industrial hygienists, safety engineers, occupational physicians and nurses, toxicologists and analytical chemists—the drive for healthful workplaces will make few gains. If an effort is not made to train more professionals, the companies concerned aren't going to have the manpower to comply with the standards and to maintain a safe and healthful workplace. States are not going to have the capabilities of enforcement and neither is the federal government. And we in NIOSH are not going to have the research potential.

It takes a long time to develop educational programs and new job categories—such as the safety and health professional that we have tried to

"It takes a long time to develop educational programs and new job categories—such as the safety and health professional that we have tried to create. Curriculum planning alone requires one or two years. Then you have to wait until students enter the program and graduate—two to four years later."

create. Curriculum planning alone requires one or two years. Then you have to wait until students enter the program and graduate—two to four years later.

The entire process takes a long time. There will be an acute shortage among professional categories for several years to come.

Baier. Practical on-the-job experience which takes another year or two is also necessary. We are really talking about a wait of five or six years before the effect of the bachelor's degree in the new occupational safety and health program is felt. Until then you have to take someone who has a degree in engineering or life sciences, for example—someone who understands the jargon—and through the training provided by on-the-job situations, you produce, so to speak, a health professional.

Q. *With the shortage of manpower, it seems even more important to put researchers to work where they will have the biggest impact. How do you determine, for example, which of the known hazards require immediate attention?*

Key. To determine priorities for standards, we use a quantitative system based on five parameters. One is the incidence index—the number of reported occupational diseases associated with that particular exposure. Information on this factor has been inadequate, but once the occupational illness and injury reporting system goes into operation, this should improve. The second factor is the relative toxicity or the severity of the occupational disease—whether it causes a dermatitis that just produces a little itching or whether it produces lung cancer that does the fellow in. The third factor is tonnage or poundage of the particular chemical produced or used each year, and the fourth is the population at risk. The fifth consideration is a trend index based on estimates of increased or decreased usage.

Baier. Then these five parameters are weighted according to relative importance.

Key. Professional experience is also an ingredient. After the chemical substances and physical agents are rated and rank ordered, the list is sent to professionals—such as the National Advisory Committee on Occupational Safety and Health. The professionals may say, for example, that based on their experience or their company's experience, a substance is too high on the list. They may recommend that it be given a lower priority.

Q. *So in setting priorities, you do get some kind of consensus view?*

Key. That's right. It's a quantitative system, but there is an attempt to get consensus also.

Baier. The weighing and the professional opinion are important. For instance, a substance may be extremely toxic, but you might find that it hasn't been used for the last five or six years. Should you develop a criteria package for it? At the most, there might be six or seven people in the United States that have contact with it. On the other hand, a substance might be a little less serious in terms of effect, but you find that 22,000 people are exposed to it. So you don't really say, "This is the rankest poison known to man, and this is what we must study"—when no one is exposed to it.

What we are really concerned with is preventing occupational disease. Our primary thrust is toward protecting the worker. It is toxicity versus hazard. A chemical in a jar can be very toxic without causing a hazard, but when it is taken from the jar you have a dangerous exposure. The over-all objective is to eliminate the hazard so people who are working for a living do not get an occupational disease.

Q. *It seems that the major job right now is amassing this kind of information.*

Key. This is why we attach so much priority on getting information from programs like the National Health Hazards Survey. This is going to give us a better input into our quantitative priority list.

Q. *Was a similar system used to determine which hazards to include in OSHA's new Target Health Hazards Program?*

Key. Yes, we worked closely with the Department of Labor in determining the health hazards to be included in the program. NIOSH also aided in presenting the program to interested and affected groups.

Q. *Once you compile the information that is required and the pressing criteria packages are out of the way, will there be a shift in NIOSH's priorities?*

Baier. Plus whether or not you get along with the fellow at the next work bench.

Key. Right. You have heard the old saw, "It's not unsafe conditions as much as unsafe workmen that produce injuries." Before the Act was passed, management's thesis was that workers were as much at fault in causing accidents as the company—if not more so.

Well, I think there is room for improvement in both areas, but we have to do the research that shows what makes the worker act unsafely. And until we come up with some practical preventive ideas from this type of research, I don't think we will make much greater inroads into the prevention of occupational accidents. There will be some, of course—enforcing standards will produce a big effect. But if we go all the way, we must identify the preventable human factors.

"By using conventional methods of preventing occupational accidents—mechanical guarding, personal protective equipment and educational programs—we can go just so far in preventing accidents. If we are going to go any further, we must have research into what motivates people, what are the aspects of the human factors that cause accidents."

Key. We expect to be doing more research into human factors and motivation in regard to accident prevention. We are specifically directed to conduct research in this area by the Act. By using conventional methods of preventing occupational accidents—mechanical guarding, personal protective equipment and educational programs—we can go just so far in preventing accidents. If we are going to go any further, we must have research into what motivates people, what are the human factors that cause accidents.

Baier. This psychological aspect of research is very important. For instance, one basic question is: does the job fit the man or does the man fit the job?

Key. And then there are the additive effects—stress, noise, fatigue, drugs. So there is a crossover between human factors that produce stress, chemical and physical factors, and factors outside the workplace like medication and drugs.

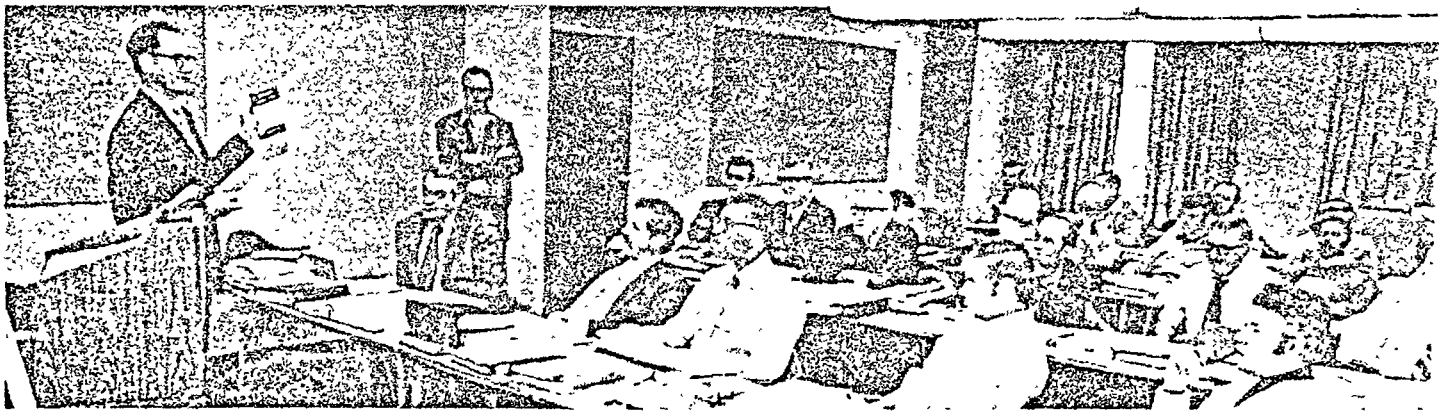
Baier. So the basic understanding of "why" an accident occurs becomes important.

Q. *Can you make any other predictions about what the future priorities of NIOSH will be?*

Key. Yes, another emphasis for the future will be the search for new or unsuspected causes of occupational diseases, probably in the pneumoconioses or cancer area. Studies will even be done on factors that shorten life. The industry-wide studies are important in this respect. Groups of workers will be studied and compared to a controlled working population that does not have the same occupational exposures. These studies are currently underway for about 1.5 million workers. In other words, we don't have to study everyone in a particular plant; we can study 10% of the workers and project these findings to the rest.

The real payoff of our activities in NIOSH lies in prevention, and this, I think, is the real significance of occupational health. □

OSHA OPENS
TRAINING INSTITUTE



School for safety officers sets high standards

January 17, 1972, marked the formal opening of the Training Institute of the Occupational Safety and Health Administration (OSHA). Located in Rosemont, Illinois, adjacent to O'Hare Field outside Chicago, the Training Institute will play a major role in helping OSHA fulfill its responsibilities under the Williams-Steiger Occupational Safety and Health Act of 1970. Its theme is "high quality professionalism."

George C. Guenther, Assistant Secretary of Labor for Occupational Safety and Health, said the facility will have trained more than 1,000 specialists by June 30, augmenting activities of the OSHA Office of Training and Education. In the opening ceremonies, Guenther said Illinois was selected for the initial training site because of its "progressive attitude" toward the program, and because the region has the "heaviest concentration of employees anywhere in the country."

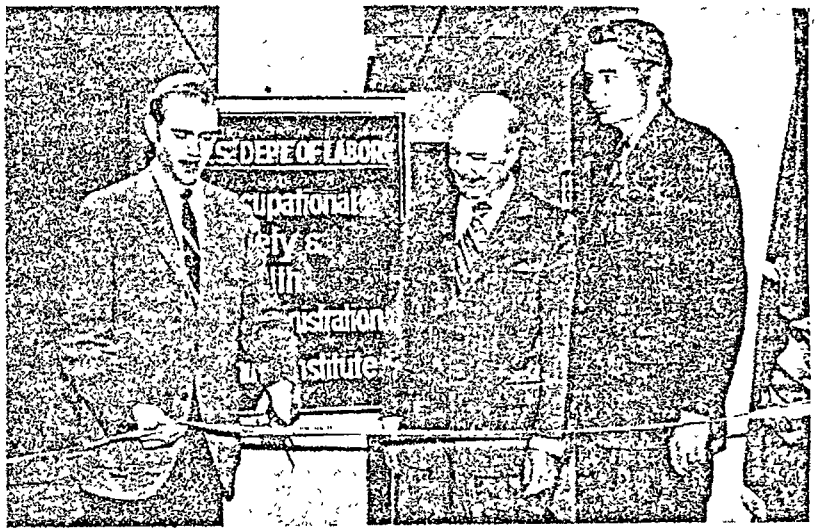
The impact of the training program will reach far beyond Chicago. Forty-five classes lasting from one to four weeks are being offered to compliance officers, industrial hygienists and state personnel from all parts of the country. Included also are 15 courses for construction instructors.

Six four-week comprehensive training classes are set for new federal and state compliance officers and industrial hygienists. The schedule also includes 11 two-week refresher courses for compliance officers. Other classes will be offered to compliance officers in the maritime and construction fields.

The Training Institute has a staff of 18, including 10 safety professionals. It supplements its teaching staff with OSHA field personnel and experts from the National Institute for Occupational Safety and Health (NIOSH). Dr. Earl Heath, Director of the Office of Training and Education for OSHA, says, "NIOSH personnel already have conducted orientation classes for several OSHA industrial hygienists and compliance officers. We intend to seek their participation in developing methods and training programs."

The Institute is using methods such as team teaching, demonstrations, case studies, role playing, practical exercises, field visits and group discussions. Extensive use also is being made of audio-visual aids, particularly videotape.

Training programs are not the sole reason for establishing the Institute. Frank Valentino, chief



Representative William Steiger, co-author of the Occupational Safety and Health Act of 1970, officially opens OSHA's Training Institute. Looking on are Howard Pyle, chairman of OSHA's National Advisory Committee on Occupational Safety and Health and president of the National Safety Council (center), and George C. Guenther, Assistant Secretary of Labor for Occupational Safety and Health (right).

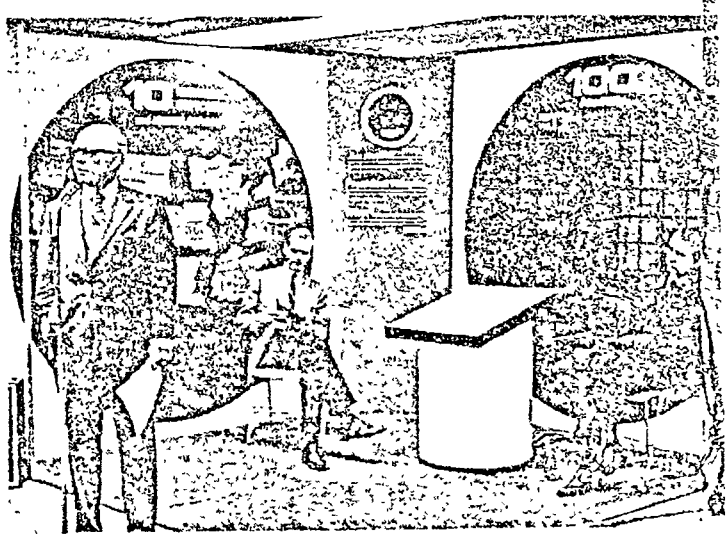
of OSHA's Division of Institute Operation, says, "The Institute is exploring other possibilities. Right now, we are looking for the best and most expedient way to train and produce qualified compliance personnel." This means collecting data on the costs of various training methods, as well as developing standards against which OSHA can measure the performance of persons who have attended the Institute.

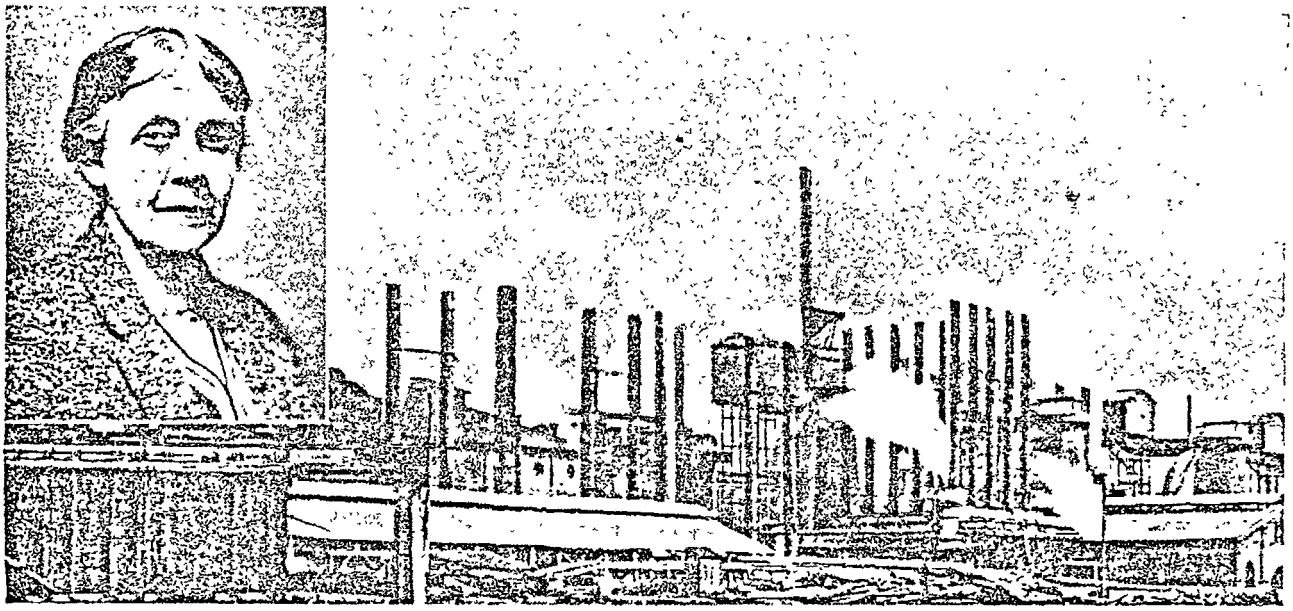
The Training Institute illustrates OSHA's decentralization efforts. Aside from procedural guidance and program evaluation from the national office, the Institute is autonomous. It does its own recruitment and procurement. Its interim manager, Edwin M. Hackett, deals directly with training coordinators in each of OSHA's 10 regional offices. Hackett comments that "the Institute has an obligation to respond to national office needs and guidelines, but there is a great deal of flexibility in the guidelines. This allows us to orient ourselves to the needs of the regional and area offices." Such flexibility is in keeping with OSHA policy, which allows for consideration of local problems, conditions and resources.

Underscoring the mission of the Training Institute, Howard Pyle, chairman of OSHA's National Advisory Committee on Occupational Safety and Health and president of the National Safety Council, told the first classes of compliance officers at the opening ceremony that "the success of this operation will depend on those in the field—you."

Representative William Steiger, co-sponsor of the Occupational Safety and Health Act, told the trainees that there are two keys to the OSHA program: voluntary compliance and professionalism on the part of the compliance officers. Work already has begun on expanding the Institute to accommodate more trainees. Three additional study and testing rooms, classroom space, an instrument lab, and a conference room are being built. The purpose is clear: Not only programs but also facilities are being redesigned to accommodate OSHA's continuing need for professionals. □

Standing in front of the OSHA exhibit with its panel of 100 questions and answers, Howard Pyle addresses the compliance officers at the Training Institute.





ALICE HAMILTON: Industrial Health Pioneer

Profile of a woman who crusaded for employee's right to a healthful workplace

by Beverly Faxon

More than 70 years ago, Dr. Alice Hamilton began to question the effect of a person's job on his health and on his life span. Her questions led her to pioneer the investigation of occupational diseases in the United States, starting with lead poisoning among Illinois factory workers.

When Dr. Hamilton began her work, attitudes toward the prevention of occupational diseases were either indifferent or negative. Many who were appalled by a spectacular industrial accident or explosion never considered the workers who were being slowly killed or disabled by exposure to toxic substances. Popular assumptions made difficult the task of those interested in helping endangered workers. Some employers, feeling sure that lead poisoning resulted from skin contact and not from breathing lead-laden air, blamed sickness on the failure of employees to wash properly before eating or to clean their fingernails before going home.

Miss Faxon is a student at Kalamazoo College, Kalamazoo, Michigan.

Most accepted the idea that workers in potentially dangerous situations operated under "assumption of risk"—that is, by accepting the job, the employee assumed the risks and dangers of his trade. The employer thus was absolved of the responsibility to provide better workplace conditions except as he might choose to do so. Improving working conditions was seen not as a responsibility of owners but as an act of benevolence.

Dr. Hamilton did much in her lifetime to undermine such comfortable assumptions. Not only did she collect evidence that established the correlation between exposures to toxic substances and certain occupational diseases. She also "helped pave the way in this country for what had evolved in England a century before: the concept of society's responsibility for the health and welfare of its citizens—including people at work."

Alice Hamilton, sister of Edith Hamilton, the well-known scholar of Greek and Roman civilizations, was born in 1869 and died in 1970. As a young

girl she decided to enter the field of medicine. After receiving her M.D. degree from the University of Michigan, Dr. Hamilton taught pathology at the Women's Medical School, Northwestern University, while living at Hull House, the social settlement house established in Chicago by Jane Addams. Conversations with neighboring workers kindled Dr. Hamilton's interest in occupational diseases—pneumonia and rheumatism among stockyard workers, "lead palsy" in painters, cases of steel mill workers falling unconscious on the job.

Through research, Dr. Hamilton discovered that the United States was far behind European countries in recognizing and preventing occupational diseases. When she began her investigation of lead industries in 1910, the only significant step that had been taken toward controlling occupational disease involved a curb on the use of white phosphorous in match-making. Workers using the white phosphorous process risked pain, facial deformities and death. Yet the United States passed legislation discouraging the white phosphorous method only after Europeans had forbidden the process in their own factories and had refused to import matches so made.

During the investigations that formed the basis for her classic studies of lead, Dr. Hamilton studied hospital records involving lead victims and talked with patients, physicians, druggists, employers and foremen. She discovered that workers in 77 occupations in Illinois were victims of lead poisoning. Painters, enamellers, smelters and many others were exposed daily to the dangerous particles.

In 1911 after the results of her survey were made public, the Illinois legislature passed a workmen's compensation law. But the new law bogged down in the courts when judges said they could see "no



Match-makers in this 1871 wood engraving risked contracting "phossy jaw," a painful disease which resulted in facial disfigurement and sometimes death. Legislation halting the use of phosphorous in match-making was not passed until 1910.

Carbon monoxide poisoning threatened the converters making bessemer steel in this 1886 wood engraving. Shields caught the sparks, but the absence of ventilation allowed fumes to escape into the atmosphere. When making field inspections, Alice Hamilton subjected herself to the same hazards faced by workers.

legal principles on which compensation for occupational diseases could rest." Not until 1936 did the Illinois legislature pass an effective law. By then 16 other states had passed compensation laws.

Later, while working with the U.S. Department of Labor, Dr. Hamilton began a nationwide survey of industries, again including lead. She also explored illnesses resulting from fumes in World War I munitions plants, tuberculosis and silicosis in miners, carbon monoxide poisoning in steel mills, carbon disulphide effects on rayon workers, and mercury poisoning in hatters and miners.

Dr. Hamilton relied not only on research but also on first-hand experience. Before confronting an employer with suggestions for health improvements in a plant or before turning in a report to the government, Dr. Hamilton conducted field inspections. She would stand close to hot furnaces, put her whole weight on a jackhammer, and walk narrow catwalks in studying the industrial world's on-the-job health problems.

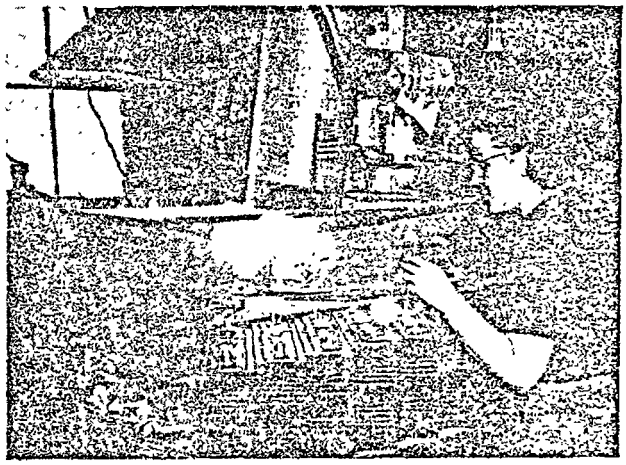
In her book INDUSTRIAL TOXICOLOGY, published in 1934, she offered employers this kind of practical advice:

"(a) Prevent formation of escape of gases, fumes and dust.

(b) If (a) is impossible, remove by means of exhausts.

(c) If (b) is impossible, dilute as much as possible by abundant ventilation and by fans blowing air past the face of the workers."

When Alice Hamilton began her crusade to correct conditions leading to occupational disease. it seemed to her that most of her American contemporaries felt it was a cause "tainted with Socialism or with feminine sentimentality for the poor."



The employee above assembles storage batteries, a product often using lead oxides. Inhaled or ingested into the system, lead can cause gastrointestinal, blood and central nervous system disorders. The target of Alice Hamilton's earliest studies, lead is still a common workplace material. NIOSH is working on a criteria document on lead. OSHA has declared it one of the Target Health Hazards.

By the end of her long career, she had succeeded in presenting facts to break through the nation's ignorance and indifference toward protecting workers from occupational diseases. She had succeeded in making medicine--and society as a whole—more aware of its responsibilities toward the health of its workers.

She had been among those to pioneer a breakthrough in attitude—surely as important as any technological development. Her work had been instrumental in changing the negative attitudes of the 19th century to the present sense of community responsibility for control of the environment—including the work environment. □

Andre Racine is young and in excellent health. He's a top hand in his trade, which is line construction. This involves building high-voltage transmission lines, and it offers steady, year-round employment, plus a very high rate of pay.

With all of this going for him, Andre is hardly the type of person who would want to end his life prematurely. But on September 15, 1971, it was almost ended for him.

Andre works for T.D. Bross Line Construction Company. Bross, in a joint venture with Savin Brothers Construction, is working in Rockland County, New York, installing a 345K transmission line for Orange and Rockland Utilities, Inc. One of Andre's co-workers dropped a pair of lineman's pliers from atop a cross-member 80 feet above ground. Andre, assembling his gear prior to ascending the 100-foot steel pole, received the falling pliers directly on the left side of his safety cap.

The reason Andre is still alive today is because the safety cap—not his head—took the punishment. These particular pliers have a wedge-shaped head, are about nine inches long and weigh close to a pound. This means that, according to calculations by American Optical Corporation's Robert F. White, "At the point of impact, after falling from a height that approximates a ten-story building, the head of the pliers was driven into its target with a force of about 80 foot-pounds."

The pliers penetrated Andre's cap, causing a 1½"-long crack in the plastic shell. But the pliers never touched the cap's suspension, let alone the man's head.

Everyone connected with the project can claim some credit for the fact that Andre was wearing his safety cap: his foreman, Blacky Madigan; Bross Company superintendent Arthur Aubin; and Dick Leppla, chairman of the safety committee. Among numerous other duties, together they formulated and enforce the safety program that saved Andre's life.

When due credits are being distributed, another man not to be slighted is Phil McLeod. An employee of Stone and Webster Engineering (construction manager for the project), McLeod has the title senior materials manager. . . . Since starting in the construction business about 25 years ago, McLeod has worked on power-transmission lines all over the United States. He's worked in swamps, plains, deserts and mountains. . . .

On the subject of safety, his voice takes on a particularly hard note. "Safety is something we take seriously around here. We don't like others joking about it. And we are getting to the point where all 300 people on this job are taking safety seriously too."

They Take Their Safety Straight!

Andre Racine points to the 1½ inch crack made in his safety cap by pliers which fell from a height of 80 feet.



First published in ENVIRONMENTAL CONTROL & SAFETY MANAGEMENT, *December 1971. Reprinted with permission of Best's Safety Publications.*

"Building a high-voltage transmission line across all kinds of terrain involves exceptional work hazards. So contractors, sub-contractors and unions represented on the safety committee added bite to their rules."

The record proves they take their safety seriously. The Ramapo-to-Hudson River Project, since its inception in January 1971, has had a total of 39 first aid cases. Only five of these involved lost time. In more than 300,000 man–hours worked this year, less than 1.5 percent of this total has been lost due to injuries. It's an enviable record. How does a company amass such a record, especially under extremely severe terrain conditions? Ask McLeod. . . .

"By working together and getting everybody involved with safety. It's a cooperative effort between the contractors, subcontractors and the unions. All have representatives on a permanent safety committee—volunteers who do this in addition to their regular jobs."

Dick Leppla, safety committee chairman, is superintendent of construction for Stone and Webster. Other representatives on the committee include people from Stone and Webster, the Bross Company, Savin Brothers, the International Brotherhood of Electrical Workers, and the building trade unions. Phil McLeod is a permanent representative who coordinates the many facets of the program.

The safety committee was organized on January 13, 1971, at a preconstruction meeting at the Stone and Webster field office in Mt. Ivy, New York. A presentation was made outlining the hazardous conditions to be expected during the coming months. It was decided that the committee would be directly responsible for all on-the-job safety. Moreover, committee members would be selected on the basis of their background and their expertise in work being done during various stages of the project.

A man was appointed to act as permanent representative during foundation construction. He was replaced by another man during erection of the steel poles, and by still another during the wire-stringing operations.

A committee member is on each pole site (worksite) once each day. The committee conducts full inspections of the sites every two weeks. In addition, field representatives from three insurance companies conduct periodic inspections. Meetings of the committee follow each inspection tour, to discuss conditions noted and necessary solutions to problems, if any.

McLeod says, "This particular job could have resulted in several fatal accidents already, considering the hazards involved. We're working in all kinds of terrain . . . mountains, valleys, forests, in close proximity to energized transmission lines and substations and to high-pressure gas lines. Access roads for men and heavy equipment have to be blasted and cut. Our right-of-way is limited since we have no wish to damage the landscape any more than necessary to build this badly-needed electrical service."

Part of the process of getting organized was a thorough study of the terrain and hazards. Members met with local officials, conservationists and utilities people who had experience in the areas through which the line's right-of-way would run. This included a visit to the directors of several children's summer camps in the area. The approach was always a presentation of facts about the project and hazards involved.

"There are potential injury situations from blasting, tree and stump clearing, concrete pouring, driving to and from the sites, equipment repair, and materials handling," says Phil McLeod, "and naturally, the actual work on the poles themselves, such as what happened to Andre."

McLeod mentions an instance where an employee put his hand into a pile of timber and pulled back a copperhead! Fortunately, the snake had sunk his fangs into the man's leather safety glove rather than his hand. "A good case for gloves," says McLeod, "but an even better case for Art Aubin's overall declaration of intent to run a safe, disciplined operation."

Continuing in this vein, McLeod says, "Not everyone realizes the importance of discipline in a safety program. We all get careless at times.

Keeping in mind that the definition of safety is really prevention of accidents, we can't work too hard to wipe out carelessness. We have some of the top people in line construction on this project and all of them know their jobs. This is the problem sometimes. They have too much confidence! We have to keep reminding them. So we are inclined to be repetitious."

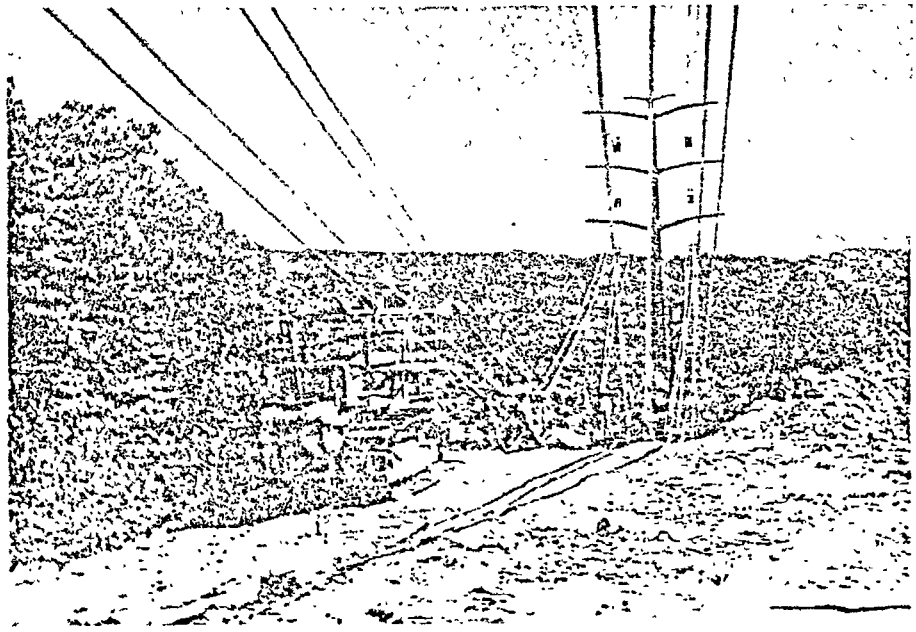
On the first Thursday of each month, a brief safety meeting is held at the start of the work day. Topics covering various aspects of safety are discussed. For example, one topic may be storage of explosives and how they should be removed from the magazine and transported to the job. Another might be a demonstration of first aid, including the latest medical theory on snakebite treatment.

Specific problems and discussions of new knowledge about site-related hazards are given time at every meeting. According to Art Aubin, "Taking this time with the men may keep them away from the project for a short time, but it is well worth it. Just compare the potential in time lost due to injury, broken equipment and higher insurance premiums. Needless to say, the tragedy of a permanently disabling injury or a death cannot be measured in dollars and cents."

The meetings are supplemented by regular safety committee memos. Memos of this type emphasize the importance of adhering to the safety rules developed for the project, plus case histories on accidents that happened and accidents prevented—better known as near misses. The fact that everyone—supervisor, foreman and individual worker—has an important role is always the parting shot of the memo. The memos are distributed by committee members to the men in their groups, reinforcing person-to-person contact.

"No safety program is going to work if its not enforced," says McLeod. "And if it's going to be enforced we have to put teeth into the regulations, and then stand by them to the letter! When we say that a specific amount of violations of safety regulations will result in dismissal, we mean it! When we say that violations of our rules by people who work for other contractors mean that these people will be banned from the project, we enforce it."

If an employee on the project is caught in violation of a safety rule, he is notified in writing. The gist of the memo is that the violation has been noted and recorded. It reminds him that the consequences could be injury to himself. In cordial terms, the memo states that the rules were developed for the workers' protection and that the



Work progresses on the transmission line for the Ramapo-to-Hudson River project.

violation was probably an oversight on his part. Mention is made also that the rules were established by the project safety committee, or included in local union by-laws or by the state and federal governments.

The fact that no further such violations are expected is mentioned firmly, but politely.

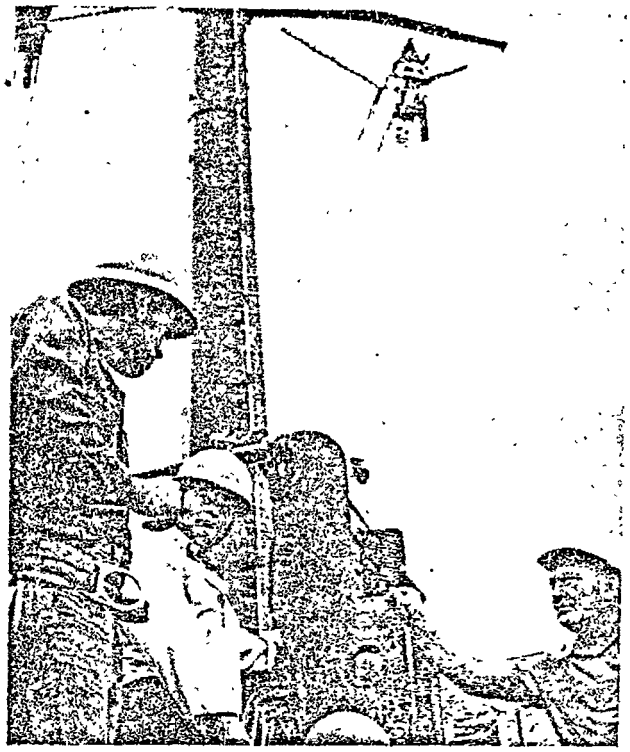
Copies of the memo are sent to each member of the safety committee for information and filed in the employee's record. According to McLeod, "Nobody is around long enough to receive more than two such memos."

Probably one of the most important points McLeod makes is that of knowing the nature of hazards that exist. Any accident is closely followed by an injury report. This means every type of accident, including minor cuts. The report includes information on location, weather conditions, and the nature of task being performed. Availability of first aid, and conditions of the general work area are noted. "In brief," says McLeod, "we want to know what went on before, during and after the accident. This gives us a complete record that helps us correct whatever conditions might have contributed to the problem." Accident reports, and whatever corrective measures have been taken as a result, subsequently are subjects for safety bulletins and for discussion at safety meetings.

"Morale on this project is as high, or higher, than on any other job I've been associated with," says McLeod. "Our safety record is the biggest contributor to this high morale as far as I'm concerned. But the program works because I believe that the committee has done an outstanding job of communicating. The program is understood by everyone on the job. Everybody participates.

"A few months ago one of our men had his eye saved by a pair of safety glasses, qualifying him for membership in the Wise Owl Club. We held a full-scale banquet, buffet style with unlimited refreshments. American Optical provided us with an artificial eye which we had made into a tie clip. Because the man understood and followed the rules regarding wearing safety equipment, he's wearing the artificial eye as a tie clip, not in an empty socket."

One important entity which safety people in all trades, professions and industries have to consider is the new Occupational Safety and Health Act



On-site inspections are conducted daily by one or more members of the project's safety committee.

(OSHA), comment both McLeod and Aubin. Says McLeod: "It's a good law if enforced. I personally feel that the major burden of enforcing this law is going to rest with the employer himself. The best route is the kind of organization we have here, where everyone is brought into the safety picture and knows exactly why."

Aubin says, "We're way ahead of OSHA. Our objective here is to prevent accidents and protect people. Our record is good not because we keep our eyes on statistics, but because we analyze our total picture, terrain, project and people. We take proper preventive action, and we enforce personal protective equipment regulations. What's more, we probe deeply into the causes of the few injuries we do have. Once we examine the cause, we make every effort to see that it can't happen again. A good example is that although we'll continue to work at the base of the poles, we won't have any more tools falling from above. As to the end result—the project is ahead of schedule, and it will undoubtedly be a highly profitable operation for all concerned." □

Safety Spotlight

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Manufacturers distribute safety booklet

The Adhesive Manufacturers Association of America has prepared a booklet, "Safe Handling of Adhesives," for distribution to its customers to assure safer handling of its products.

The booklet explains the uniform labeling practices and includes pictures of the different labels used. The three possible hazards of adhesives—effects on the skin, fire, and toxicity—are described, and methods to combat them are explained. For copies, write Adhesives Manufacturers Association of America, 441 Lexington Avenue, New York, New York 10017.

Keep your hat on!

Pepper Construction Company of Chicago recently sent its 80 foremen and supervisors to a two-day safety course given by the Building Construction Employers Association (BCEA). One of the results is a new regulation that makes the wearing of hard hats a condition of employment.

Allen Quinn, Pepper's safety engineer, tells why: "Right now we're concentrating on hard hats and requiring that everyone on the job wear them at all times—even the executives when they come around. There's no question that hard hats can save lives. Recently one of our men fell 14 feet and landed on his head. If he weren't wearing a hard hat, chances are he wouldn't be around today."

Pepper is also urging its men to wear safety glasses and safety shoes. The company provides protective equipment the first time. If an employee loses an item, he pays for its replacement.

John Skanderup, president of the 600-employee company, explains the stepped-up safety effort: "While we have had a voluntary safety program for many years, our efforts are being redoubled now that safety is a federal requirement. The biggest job is educating our people to the importance of safety and getting them to follow the rules."

BCEA conducts several safety courses each month. For more information, write 228 North LaSalle Street, Chicago, Illinois 60601.

Shoring school too successful

In April 1971 the Sacramento Valley Chapter of the American Society of Safety Engineers enrolled twelve persons in a shoring safety training course. Today there are 500 graduates of the program—and a waiting list so long that chapters in four other cities across the country are organizing similar schools.

The one-day course trains those involved in sewer, water, gas, electric and telephone trenching in the proper methods of shoring for underground construction work. The training is designed to reduce the significant number of deaths and serious injuries caused by trench cave-ins. Superintendents, foremen, inspectors, engineers contractors and linemen have attended the classes.

The State of California Industrial Safety Division Construction Section has provided an instructor for all classes to date. The American Society of Safety Engineers believes that there is a need for many such courses across the nation. Finding qualified instructors is one of the chief obstacles. Since the aluminum hydraulic shoring process has become popular only within the last six years, there is a shortage of qualified instructors to teach these classes.

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Labor Safety Award deadline

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Old adage—new safety twist

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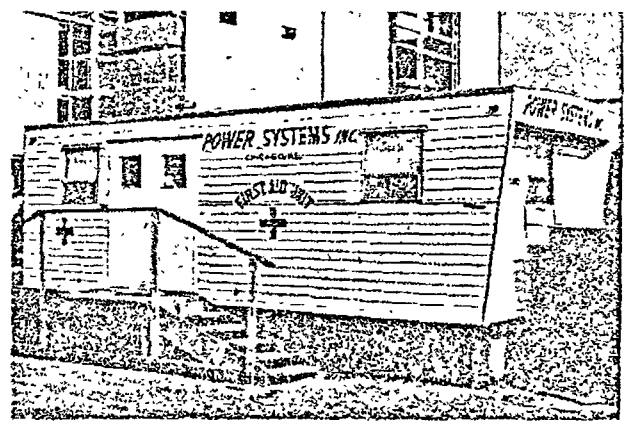
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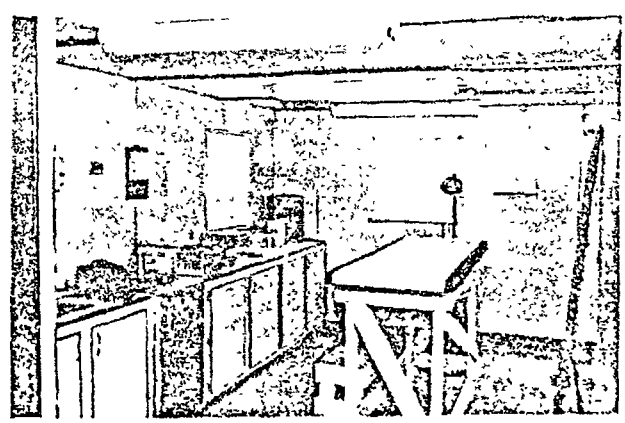
Operated by Power Systems, Inc., the 10 by 28 foot custom-built trailer is one of three field units currently in use on the company's construction sites. The trailer contains equipment not usually found in a first-aid center—a cardiac monitor, a wide range of emergency respiratory and orthopedic gear, intravenous solutions, and a variety of emergency drugs. These "extras" made a difference to the men who fell to the ground and lived to tell about it. The immediate availability of intravenous infusions and drugs was a key factor in their survival.

The purchase of high-priced medical equipment was made possible, in part, by savings realized by improvising other items. An examination and treatment table was made from scrap materials at the site. Hangers for intravenous infusions and irrigation solutions, and spinal support boards for the transportation of persons with back and neck injuries are other "home made" items. Economical aluminum baking trays with snap-off plastic covers substitute for expensive stainless steel containers as dust-protective holders for instruments and medicines.

Power Systems states that "an enlightened safety program is necessarily augmented by enlightened first-aid coverage for employees." Companies interested in exchanging ideas on first-aid facilities may write to Power Systems, Inc., 600 West Jackson Boulevard, Chicago, Illinois 60606.



A mobile first-aid unit, the trailer above is equipped to provide emergency care for construction workers.



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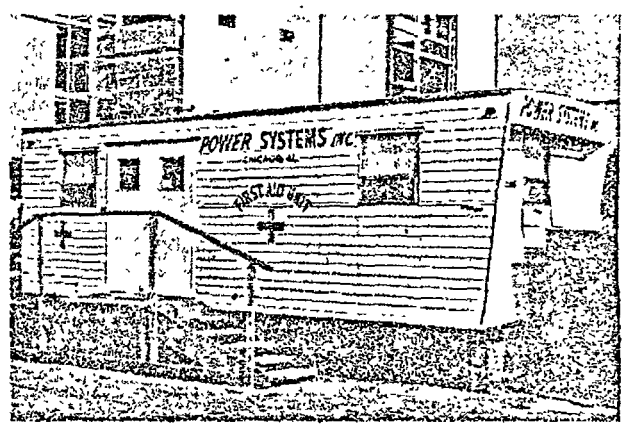
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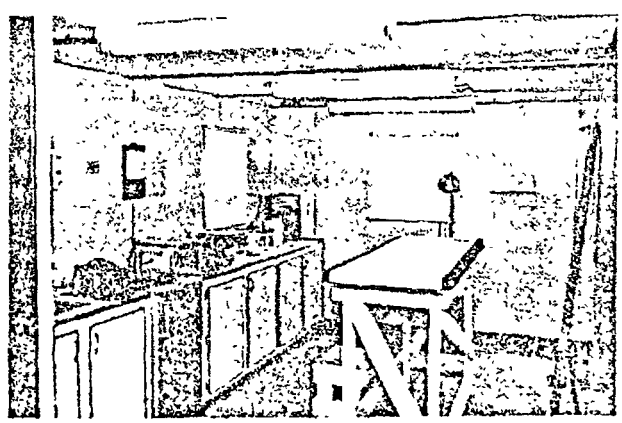
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For the Record

Timetable set for changes in standards

A timetable for 46 proposed changes in standards affecting the workplace environment has been announced by the Occupational Safety and Health Administration (OSHA). The timetable calls for changes in 31 standards by the end of 1972 fiscal year (June 30, 1972) and an additional 15 by the midpoint of fiscal 1973 (December 31, 1972).

The changes are key parts of a three-phase program of standards development by the OSHA Office of Standards under Acting Director Gerard F. Scannell.

The first phase involves correction of typographical errors and similar nonsubstantive items found in the initial standards published in 1971. The second phase clarifies adopted national consensus standards and revokes some provisions because of their discriminatory nature or because they conflict with other parts of the standards. The third phase involves adopting new standards, developed either by national consensus standards-setting organizations or by the Department under procedures of the Williams-Steiger Act.

Assistant Secretary of Labor George C. Guenther said, "We are announcing the schedule for these proposed changes so as to inform interested parties of OSHA's intentions. Due to the complex technical nature of many of the standards, the timetable cannot be considered absolute, but reflects our best estimate of what can be accomplished during the balance of 1972."

Among the proposed changes are the following:

- Amending the construction section for roll-over protective structures for vehicles.
- Making technical changes and corrections in sections affecting powered platforms, manlifts and vehicle-mounted platforms, and compressed gas and compressed air equipment.
- Adding new sections on protective helmets for electrical workers, slings, uniform traffic control devices, exists, sprinklers, foam, mechanical power transmission guarding, bakery equipment and floating cranes and derricks.
- Adding new sections on woodworking machinery, oil burning equipment, ovens and furnaces and installation of gas appliances.
- Adopting the 1971 Threshold Limit Values of the American Congress of Governmental Industrial Hygienists on toxic substances and noise, replacing 1968 and 1970 levels.
- Promulgating an asbestos standard to replace the emergency standard issued December 7, 1971.
- Amending the construction standards to correct conflicts, duplications and technical errors, including those on catch platforms and scaffold heights.
- Completing a section on electrical transmission and distribution lines and equipment, including specific standard for the electrical utility industry.
- Bringing sections of the general industry standards and the construction standards into conformity.
- Adding a section on installation of gas piping and gas equipment on industrial premises.
- Bringing maritime standards into conformity with other standards where like hazards are covered.
- Adding sections on longshoring on the docks, diving operations and workmen's hoists.
- Revoking the ban on pump-jack scaffolding.
- Adding amendments on tunneling to the construction standards.
- Resolving differences on scaffold requirements.
- Adopting a new standard on bis (chloromethyl) ether.
- Adding parts of a new consensus standard on machine guarding for woodworking machinery, and on work in confined spaces.
- Adding new sections on dredging and local exhaust systems.
- Promulgating, in coordination with the National Institute for Occupational Safety and Health, standards on two of the OSHA Target Health Hazards: carbon monoxide and silica.

States receive planning grants

Fourteen states have received $978,725 to assist them in developing their own on-the-job safety and health programs. George C. Guenther, Assistant Secretary of Labor for OSHA, announcing the grants, said these awards bring the total federal allocation to date to $5.68 million.

The allocations involve federal funds of up to 90 percent of the total cost of the projects, which is being started immediately. Participation by Hawaii and Nevada brings to 48 (plus the District of Columbia and Puerto Rico) the number of states receiving grants for assessing their occupational safety and health needs and preparing a state plan.

Section 18(b) of the Williams-Steiger Occupational Safety and Health Act of 1970 provides for states to

assume operation of their own programs, and Section 18(c) lists the criteria to be met by states wishing to submit their plans to the Department of Labor for approval. Following are the grants awarded:

- Alabama, a $72,418 amendment to its original grant for developing an 18(b) plan.
- Alaska, $157,130 to develop compliance procedures for the state's three high-hazard industries (construction, logging and wood products, and petroleum and pipeline), to prepare legislative action for support of a plan, and to prepare an acceptable plan under Section 18(b).
- California, $105,781 for data collection, code comparison, and legal analysis basic for its plan under Section 18(b).
- Hawaii, three grants: $34,590 to develop a management information system; $62,272 to catalogue standards and develop a plan; and $15,468 to prepare legislative actions in support of a plan.
- Illinois, $27,630 to continue work in such areas as local authority pre-emption, measurement of its effectiveness and OSHA-related standards.
- Maine, $74,997 to continue developing its plan for including state and local employees under Section 18(c)(6).
- Mississippi, a $89,229 amendment to its original grant to continue developing an 18(b) plan.
- Montana, $32,278 to review fire hazards and how to combat them, and to integrate the results of this study into development of its state plan.
- Nebraska, two grants: $52,000 to assess its needs in developing an enforcement program under the Act; $37,102 to identify and evaluate occupational health hazards in the state.
- Nevada, $72,458 to determine its needs and responsibilities in order to develop its state plan.
- New Jersey, $6,922 to determine personnel requirements for enforcement and legal services, and $41,808 to integrate other current and completed projects into a state plan.
- Texas, a $1,758 amendment to an earlier grant.
- Washington, $47,569 to evaluate farm workers' exposures to occupational health hazards.
- Wisconsin, $47,215 to continue developing its state plan.

Construction standards amended

Forty-three amendments to the original construction standards issued April 17, 1971, have become effective.

George C. Guenther, Assistant Secretary of Labor for Occupational Safety and Health, said: "The amendments are the result of written comments and oral testimony received from interested persons and associations such as the Associated General Contractors, the National Association of Homebuilders, and the National Construction Association, recommendations of the OSHA Advisory Committee on Construction Safety, and of course our own considerations."

The amendments include new rules for medical services, safety belts, safety nets, temporary heating devices, switches, rigging equipment, excavation, and trenching requirements.

Grants for data gathering

Virginia and West Virginia are the first states to receive OSHA grants to assist them in funding studies of work injuries and illnesses. The information obtained from the studies, part of the national data gathering project, will be used to encourage the development of state safety and health programs and help establish industry standards for job safety and health.

Decision on walk-around pay

In a decision interpreting the Williams-Steiger Occupational Safety and Health Act of 1970, Assistant Secretary of Labor George C. Guenther has concluded that Mobil Oil Corporation did not discriminate against employees when it refused to pay them for time they spent with federal safety and health inspectors in a "walk-around" inspection. Guenther based his decision on a legal opinion by the Solicitor of the Labor Department, Richard F. Schubert.

Under the Act, an authorized representative of employees must be given the opportunity to accompany the federal inspector. Mobil provided this opportunity but refused to pay the employees for the time they spent on the walk-around.

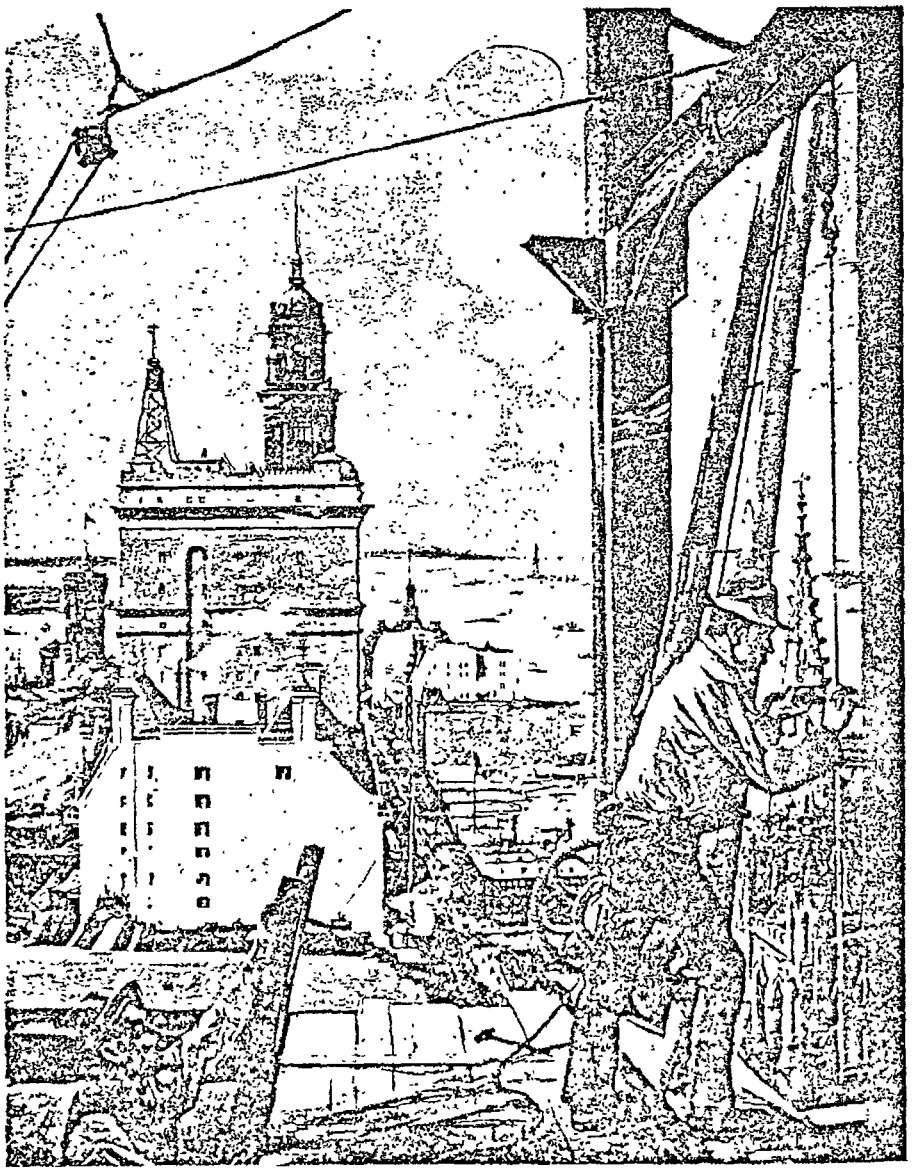
The law forbids discrimination against employees because of their exercise of rights provided by the Act. The case reached Guenther when the Oil, Chemical and Atomic Workers Union (OCAW) alleged that Mobil's refusal to pay for the walk-around time constituted discrimination forbidden by the Act.

OCAW's argument was that any employer's refusal to pay employees for walk-around time is discriminatory. The opinion rejects this argument, concluding that employees in the walk-around were not engaged in regular work, and that Mobil refused to pay them, not because of the walk-around, but because they were not working.

The opinion also concludes that walk-around time is not compensable working time under the Fair Labor Standards Act.

The legal opinion states that some cases where discrimination is alleged would be more appropriately handled by use of grievance-arbitration provisions of collective bargaining agreements. Such cases would include disputes over the interpretation of the bargaining agreement. □

Historical Hazards



The job of erecting the New York skyline was accomplished at great risk to some of the employees involved. This 1895 drawing shows construction workers on the steel girders of the American Surety Company Building. In the distance are the Produce Exchange, the Manhattan Life Building and the Trinity Church Spire.

Underfoot are ropes and tools carelessly strewn about. The poor housekeeping increases the danger of slipping and falling—from a platform 20 stories above street level. The working platform lacks guard rails to protect the men from such falls. They are vulnerable also to objects falling from above. A falling wrench, for example, would strike an unprotected head, rather than a hard hat.

Today no construction worker needs to accept such risks to do his job. OSHA standards require the use of protective clothing. Not only hard hats, but also safety goggles, shoes and gloves reduce the risk of personal injury. The standards also require that every open-sided platform six feet or more above the ground be guarded by a railing equipped with a toe board to keep the equipment, as well as the employees, from falling. Safety belts and nets provide further safeguards to protect the employee on the job.

News from NIOSH

New curriculum focuses on safety and health

Under a contract with the National Institute for Occupational Safety and Health (NIOSH), Auburn University in Auburn, Alabama, is designing new undergraduate and graduate curriculum in occupational safety and health. This program is part of the NIOSH effort to help supply enough qualified safety and health professionals to meet the growing needs of industry and government.

The curriculum developed by Auburn is the first of its kind. The program offers students the opportunity to enter an established field—industrial engineering—and to focus on occupational safety and health. The new emphasis is made possible by requiring students to take 30 hours of courses in safety and health in place of the electives previously open to them. The new courses include: occupational accident prevention, occupational hygiene engineering, occupational safety and health laboratory, design for hazard reduction and introduction to acoustics and noise control.

The industrial engineering student who elects this program will be trained to evaluate workplace conditions and loss potential factors. He will also be qualified to design and implement occupational safety programs and health controls. In January 1972 the industrial engineering department enrolled 22 students in the new program.

In addition, the Industrial Engineering Department at Auburn is planning a master's degree program that also will concentrate on occupational safety and health.

Tracking down the hazards

NIOSH regional offices will respond to written requests for a hazards evaluation of workplace substances suspected of having toxic effects. An employer or an authorized employee representative may request the evaluation. An employee representative is defined as a collective bargaining representative, or a person with at least two other written employee authorizations, or one employee from establishments where three or fewer workers are employed.

After receiving the request for a hazards evaluation, the regional office will send an industrial hygienist to the worksite to analyze the toxicity of the substance in question. Some requests could result in medical examinations or new toxicity studies on animals. If the substance is toxic, NIOSH will recommend to the Secretary of Labor an environmental limit to control the exposure.

A one-page instructional sheet to use in filing a request is available from the NIOSH Division of Information, 5600 Fishers Lane, Rockville, Md. 20852, and from the NIOSH Division of Technical Services, 1014 Broadway, Cincinnati, Ohio 45202. Forms also may be obtained from the ten NIOSH regional offices: Region I: Government Center, John F. Kennedy Federal Building, Boston, Mass. 02203; Region II: Federal Building, 26 Federal Plaza, New York, N.Y. 10017; Region III: 401 North Broad Street, Philadelphia, Pa. 19108; Region IV: 50 Seventh St., N.E., Atlanta, Ga. 30323; Region V: 300 South Wacker Drive, Chicago, Ill. 60607; Region VI: 1100 Commerce Street, Room 8–C–53, Dallas, Tex. 75202; Region VII: 601 East 12th Street, Kansas City, Mo. 64106; Region VIII: 19th and Stout Streets, Federal Building, Denver, Colo. 80202; Region IX: 50 Fulton Street, 254 Federal Office Building, San Francisco, Calif. 94102; Region X: 1321 Second Avenue, Arcade Building, Seattle, Wash. 98101.

Appointments made

Edward J. Baier began his appointment as Deputy Director on February 22, 1972. Baier formerly was Director of the Bureau of Mine and Occupational Health and Safety of the Pennsylvania Department of Environmental Resources. He is a director of the American Board of Industrial Hygiene and a past chairman of the American Conference of Governmental Industrial Hygienists. As Deputy Director, Baier will assist in the overall direction and management of NIOSH operations.

Alfred C. Blackman, formerly managing director of the American Society of Safety Engineers, has been appointed Assistant Director for Safety at NIOSH. Blackman reports directly to NIOSH Director Marcus M. Key, and is responsible for providing guidance and coordination for the Institute's role in occupational safety.

Permanent asbestos standard proposed

NIOSH recently issued "Occupational Exposure to Asbestos," a 126-page document containing criteria for a recommended standard. The study recommends that employees not be exposed to an average greater than 2.0 asbestos fibers per cubic centimeter (cc) of air for an eight-hour, time-weighted concentration. It also recommends that peak concentration not exceed 10.0 fibers/cc, as determined by a minimum-sampling time of 15 minutes.

Publications

Federal Register

Listed below are recent issues of the FEDERAL REGISTER which contain information about the Occupational Safety and Health Act. Copies of the FEDERAL REGISTER are on file at all Federal Depository Libraries. Single copies may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402 at 20¢ per copy. Subscriptions are available at $25 per year.

Standards—General Industry

● Vol. 37, No. 14, pp. 929-931, January 21, 1972, Chapter XVII, Part 1975—Coverage of Employers Under the Williams-Steiger Occupational Safety and Health Act of 1970. Contains purpose and scope, basis of authority, extent of coverage of the Act.

Standards—Construction

● Vol. 37, No. 32, pp. 3431, February 17, 1972, Chapter XVII, Part 1910—Occupational Safety and Health Regulations for Construction, and Part 1926—Safety and Health Regulations for Construction. Updates and clarifies provisions concerning the applicability of certain electrical standards.

● Vol. 37, No. 33, pp. 3512-20, February 17, 1972, Title 29, Parts 1910 and 1926—Contains background information pertaining to miscellaneous amendments to construction safety standards.

● Vol. 37, No. 38, p. 3989, February 25, 1972, Part 1926—Safety and Health Regulations for Construction. Corrects FEDERAL REGISTER issue of February 17, 1972, concerning "hazardous locations."

Standards—Miscellaneous

● Vol. 37, No. 36, p. 3830, February 23, 1972, 29 CFR, Part 1910—Contains information on proposed limit on maximum allowable capacity of glass and plastic containers for certain Class 1A and Class 1B flammable liquids.

● Vol. 37, No. 38, p. 3992, February 25, 1972, 29 CFR, Part 1910—Standard for Exposure to Asbestos Dust. Contains supplement to Notice of Proposed Rulemaking.

Standards—Activities

● Vol. 37, No. 16, pp. 1146-48, January 25, 1972. Notice of Application for Variance and Interim Order, Rust Engineering Co. et al. Concerns request for a variance and interim order pertaining to personnel hoists and boatswains' chairs.

● Vol. 37, No. 41, p. 4312, March 1, 1972. Concerns petitions filed by American Society for Testing and Materials for acceptance as a nationally recognized standard-producing organization.

● Vol. 37, No. 48, pp. 5198-99, March 10, 1972, Notice of Application for Variance and Interim Order, PPG Industries, Inc. Concerns an application for a variance and interim order pertaining to the specifications for accident prevention signs and tags.

OSHA Publications

Copies of the following are available in limited quantities. They can be obtained free from OSHA regional offices (addresses will be found on inside front cover) unless otherwise stated.

Compliance Manual

Contains guidelines for OSHA regional and area personnel to follow in implementing the Occupational Safety and Health Act of 1970; procedures for processing contested cases with the Review Commission; and information regarding citations, proposed penalties and other OSHA activities. Available from U.S. Government Printing Office, Washington, D.C. for $2.00.

Fact Sheet for Small Businesses on Obtaining Compliance Loans

Outlines the procedures for small businesses to follow in order to obtain OSHA assistance in applying for Small Business Administration loans to help them meet OSHA standards.

Handy Reference Guide

Pocket-sized 26-page guide to the Act, describing its coverage, purpose, penalties and other items every employer should know. 20¢ a copy from Government Printing Office, Washington, D.C. 20402.

Inspection!

A SAFETY STANDARDS reprint describing the procedures followed by an OSHA compliance officer inspecting an establishment for safety problems.

100 Questions and Answers About OSHA

Answers the 100 most-frequently-asked questions about OSHA. Contains sections on compliance, standards, recordkeeping, state programs and several other categories.

OSHA's Recordkeeping Requirements

A reprint of a SAFETY STANDARDS interview with Thomas J. McArdle, the Assistant Commissioner, Bureau of Labor Statistics, who talks about the OSHA recordkeeping system and why it was needed.

The Safe Use of Anhydrous Ammonia

Describes the injury potential of anhydrous ammonia fertilizer. Also contains information on precautions to take to prevent accidents and what to do if an accident occurs.

Safety and Health Training Resources Handbook

A 150-page reference book published by the Federal Safety Advisory Council covering safety and health training programs and materials. $1.25 per copy from the Government Printing Office, Washington, D.C. 20402.

Setting New Standards for Job Safety and Health

A SAFETY STANDARDS reprint outlining the procedure for developing new safety standards or updating old ones.

The Target Industries: Profiles of Five Hazardous Occupations

A reprint of the SAFETY STANDARDS series on the safety problems of the five target industries—those with high injury-frequency rates. Industries discussed are longshoring, meat processing, lumber and wood products, manufacturing mobile homes, and roofing and sheet metal.

NIOSH Publications

Single copies of the following are available free from the Office of Public Information, National Institute for Occupational Safety and Health, 1014 Broadway, Cincinnati, Ohio 45202.

Annual List of Toxic Substances 1971

Provides a convenient reference source for potentially hazardous materials and serves as a guide for research needed in setting new occupational health standards.

Criteria for a Recommended Standard: Occupational Exposure to Asbestos

Recommends methods of controlling worker exposures to asbestos and sets the limit required to prevent asbestosis and to guard against asbestos-induced cancers.

Occupational Disease—The Silent Enemy

A pamphlet covering general aspects of occupational diseases. Available in quantity.

Occupational Health Kit

Basic reference material of NIOSH concerning the Occupational Safety and Health Act of 1970.

Occupational Health Services for Employees: A Guide for State and Local Governments

Designed for officials seeking information about the content of occupational health programs and activities of other government agencies, and to stimulate greater interest in health needs of government workers.

Publications on Occupational Health Careers

Announcement of Courses

Division of Training, National Institute for Occupational Safety and Health. Public Health Service, 1014 Broadway, Cincinnati, Ohio 45202.

Community Health Nursing for Working People

Public Health Service, No. 1296. Rev. 1970, Office of Public Information, National Institute for Occupational Safety and Health. 1014 Broadway, Cincinnati, Ohio 45202.

The Extended Role of the Nurse in Occupational Mental Health Programs

Nursing Series Bulletin No. 3–71, Industrial Health Foundation, Inc., 5231 Centre Ave., Pittsburgh, Pa. 15232.

Directory of Approved Allied Medical Educational Programs

Council on Medical Education, American Medical Association, 535 North Dearborn St., Chicago, Ill. 60610.

Horizons Unlimited: A handbook describing rewarding career opportunities in medicine and allied fields, Ninth edition, 1971, American Medical Association, 535 North Dearborn St., Chicago, Ill. 60610.

Occupational Health Content in Baccalaureate Nursing Education

Public Health Service, No. 1788. Office of Public Information. National Institute for Occupational Safety and Health, 1014 Broadway, Cincinnati, Ohio 45202.

Physician Support Personnel in the 70's: New Concepts

American Medical Association, 535 North Dearborn St., Chicago, Ill. 60610.

Public Health Nursing in Industry

Public Health Service No. 1788, Office of Public Information. National Institute for Occupational Safety and Health, 1014 Broadway, Cincinnati. Ohio 45202.

Selected Training Programs for Physician Support Personnel

National Institute of Health, Bureau of Health Manpower Education, Division of Manpower Intelligence, Bethesda, Md. 20014.

Journals on Occupational Health

American Industrial Hygiene Association Journal

School of Public Health, University of Michigan. Ann Arbor, Mich. 48104. Monthly, $20.00 per year.

American Journal of Public Health

American Public Health Association, 1015 Eighteenth St. N.W., Washington, D.C. 20036. Monthly, $20.00 per year.

Annals of Occupational Hygiene

The British Occupational Hygiene Society, Fairview Park, Elmsford, N.Y. 10523. Quarterly, $35.00 per year.

Archives of Environmental Health

American Medical Association, 535 North Dearborn St., Chicago, Ill. 60610. Monthly, $12.00 per year.

British Journal of Industrial Medicine

British Medical Association, Tavistock Square, London. WC1, England. Quarterly, $12.00 per year.

Journal of the American Medical Association

American Medical Association, 535 North Dearborn St.. Chicago, Ill. 60610. Weekly, $23.00 per year.

Journal of Industrial Psychology

P.O. Box 969, Easton, Md. 21601. Quarterly, $12.00 per year.

Journal of Occupational Medicine

Industrial Medical Association, 55 East Washington St., Chicago, Ill. 60602. Monthly, $16.00 per year.

Occupational Health Nursing

The American Association of Industrial Nurses, 79 Madison Ave., New York, N.Y. 10016. Monthly, $10.00 per year.

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