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FEATURES

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Industrial Hygiene Field Station Set up in Salt Lake City

An industrial hygiene field station, the first to be established west of the Mississippi, is being set up in Salt Lake City, Utah, by the Division of Industrial Hygiene, USPHS. Plans are under way to locate the station at the University of Utah, the geographic center of the Rocky Mountain and Pacific coast area to be served. The establishment of this unit has arisen out of the need to give more direct technical service to the official industrial hygiene agencies in the Western States than has been possible from the Washington office because of the distances involved. Requests for public health service assistance have multiplied in recent years with the expansion of industry in the West.

The provision of engineering and laboratory services will be the immediate aim of this unit, which will offer prompt analysis of samples of atmospheric contaminants in working environments in the area to the official State industrial hygiene agencies. The laboratories will also be made available to Utah University's graduate students for research in industrial hygiene.

The station will be staffed immediately by an engineer and a chemist. Later the work will be expanded to include medical and nursing consultation as well as additional environmental services. Special studies will also be conducted on industrial health problems peculiar to this region.

Through assistance to official industrial hygiene agencies, provided by the field station, the health programs of industries in the Western States will be strengthened. Sickness absenteeism alone results in a loss of over 500 million man-days a year, of which this area, representing 30 percent of the Nation's labor force, claims a large portion. The region now has all types of industries, including metal mining and smelting, food processing, transportation, and chemical industries. The new field station should play an important part in assisting State agencies to provide increased industrial hygiene service to these industries.

Health Education Experts Recommend Intensive Study by Representative Group to Determine Effectiveness of Educational Methods

DR. PARRAN, CHAIRMAN OF PANEL

A panel of 22 speakers and other participants in the meeting of health education experts at the Ninth Annual Congress on Industrial Health recommended the formation of a committee to study comprehensively the effectiveness of health education programs in America in terms of their impact on the attitudes and behavior of the workers. Dr. Thomas Parran, Dean, School of Public Health, University of Pittsburgh, was chairman of the panel on Health Education in Industry. The meetings were held in Chicago January 17 and 18. Other panel committees discussed the scope and distribution of medical services in industry; environmental hygiene; and medical aspects of industrial human relations. Recommendations made by these panels will be reported in later issues of the *Newsletter*. The Congress was sponsored jointly this year by the Division of Industrial Hygiene of the U. S. Public Health Service and the Council on Industrial Health of the American Medical Association.

In summarizing the opinions of his panel, Dr. Parran said, "Although difficult of measurement, health education has played a major role in reducing accidents and occupational illnesses, promoting employee morale, and reducing turn-over.

"This Congress is agreed that, while health education programs in America involve a tremendous expenditure of financial and human resources, no careful and sustained effort has yet been made to study comprehensively the effectiveness of these programs in terms of their impact on the attitudes and behavior of the workers. The collation of scientific data in this field and the development of workable criteria for successful health education programs are urgently needed by all interested groups and agencies in this field as a guide to improving their programs and techniques.

"It is therefore recommended that an ad hoc committee of experts be set up by the United States Public Health Service, after consultation with the American Medical Association and national labor and management groups, to explore these needs; that this technical committee include experts in advertising, health education, workers' education, psychology, group dynamics, preventive medicine, industrial medicine, industrial hygiene, industrial relations, and union health and safety.

"The purposes of this committee should be: 1. To plan studies in the following areas: (a) Content of programs—drawing the worker, who is the consumer of health education, into the planning stage of these programs for a valid determination of his wants; (b) Types of programs—the determination of objective criteria as to relative efficacy of various types of media and techniques and combinations thereof; (c) Materials—used in all types of programs, their preparation, distribution, and evaluation; (d) Evaluation—study of tested research methods to determine their applicability to the development of criteria for effective health education programs among industrial workers, and development of new techniques of evaluation as needed.

"2. To recommend means for carrying on these studies, including recommendations as to participation by various expert groups.

"3. It is recommended that the Public Health Service and the American Medical Association explore the possibility of jointly financing studies recommended by the committee, including publication and distribution of the findings.

"Health education is important to both management and labor. It is not a process that can be imposed upon people. Experience has shown that health education is most effective as a cooperative effort planned and executed on a joint basis by representatives of management and unions, or in the absence of unions, by employees selected by their fellow workers.

"The panel therefore recommends that industrial physicians, safety engineers, public and private health agencies, management and labor groups make every effort to stimulate the establishment of a joint management-labor health and safety committee on local levels for the purpose of planning and carrying out year-round extensive health and safety education programs.

"The panel also recommends the coordination of services and facilities in the community through health councils representing the various groups concerned with industrial health at the local level.

"The panel recommends, too, that, as part of the training that health educators receive in community organization, the subject of industrial and labor organizations be included in the curriculum so that trained health educators may have a better understanding of these institutions and their availability for participation in total community health education."

STEINHAUS

The first speaker on the Health Education panel was Dr. Arthur Steinhaus, Professor of Physiology of George Williams College, Chicago. Dr. Steinhaus' subject was "Health Education Can Be Good Business." Excerpts from his speech follow:

"Our question in this panel deals with what measures for attaining health are good business and, specifically, is health education good business. We might ask ourselves, what is health education? There is the category which we may call the health services, and over against that, another category, health education; the categories distinguish themselves one from the other, not in their goal as they are both working for health; not on the basis of prevention or cure, as they are both interested also in prevention; but by methods that they employ and very simply, it is this:

"The services do things *for* people. For instance, they operate on them, they bandage them, they give them pills, they vaccinate them, they put iodine in their salt, they take mosquitoes out of their environment, they intend to make this world a safe place in which to live.

"Education does nothing for people. Education helps people to do things for themselves, and if health is a state of complete physical, mental, and social well being, then health education is helping people to live in such ways that their ways of living will contribute to their physical, mental, and social well being.

"Health education is based on two great assumptions. In the first place, it is assumed that the way a man manages his activities from day to day, what he eats, what he drinks, how he sleeps, how he feels, how he manages his personal life, that the way he manages in this sense does make a difference regarding his health.

"The second assumption is that education can do something about it. Education can help a man to change his less healthful ways of living to more healthful ways of living.

"I have, in the past, had opportunities to talk with management on many occasions, and on one occasion at least, to a representative of the International Ladies' Garment Workers Union in New York. I have asked both groups, 'What do you do in health education?' and from both, I got answers something like this: 'We do a lot! We have a complete medical service department, excellent clinics. We have hospital insurance. We have first-aid stations. We have immaculate rest rooms. We have athletic facilities, all kinds of safety devices, and every kind of sanitary installation, rest periods, lunch rooms, free coffee, 40-hour week, 5 holidays with full pay, and paid vacations.'

"That is not what I am talking about. I asked, 'What are you doing in health education?' These are services offered to people. These are opportunities given to people. These are things done for people. This is not education. I grant that these are all very important and we would not be without them. That is not what I am talking about. Providing medical service is not more health education. It is not any more health education than is giving a man a stenographer to teach him how to write or spell. To give him things is not helping him to do anything for himself, although it may be important to make these opportunities available to him. In fact, the over-emphasis on service to the exclusion of what a man can do for himself may be fundamentally wrong. It may build in him the wrong attitude of having things done for him and expecting more and more to be done for him by his employer, perhaps the state. He must learn to do things for himself, and only through education will this be accomplished.

"The physical examination itself is not health education, but helping a man to see the need for regular physical examinations; helping to develop an attitude that takes him to the doctor at the right time, when he feels the first lump that might be cancer, etc. Helping him to understand the findings of his examination and how to adjust his life to his physical condition. That is education.

"Not the hospitalization plan, but developing in a man an appreciation of the importance of hospitalization insurance for his family, not just as a requirement, something taken out of his pay envelope. That difference is education.

"Not the nurse of the first-aid station; helping him to understand the importance of first aid, when to seek the nurse's advice, such as when to take a short rest. That may be education.

"Not the athletic field or the equipment, but giving him an understanding of the place of athletics and recreation in his life to use his facilities wisely at all ages. That is education.

"Not the safety provisions but developing the feeling of urgency to cooperate with all safety rules and provisions in the shop and at home. That is education.

"Not the rest period, but guiding him to use his rest periods so he will return to his workbench a refreshed person. That is education.

"Not the cafeteria, but helping him to select and enjoy wholesome food at work and away from his work. How to keep his weight under control. That may be education.

"Not holidays, but helping him to use his evenings and his holidays and vacations to make him more fit physically and socially. Yes; helping him to develop a philosophy so that he sees his importance in the large scheme of things. That may be education.

"You must agree with me that without such education, the money spent for elaborate services is wasted or at best paying inadequate dividends. Some people will say, 'It's none of industry's business or anybody's business what a man does with his own life.' This is a very superficial reaction. From the cradle to the grave, all of us are constantly influenced to change our ways of living—home, school, friends, church, advertisers, press, radio, etc. The question should be, 'Is the influence one that will advance the person who is influenced, or only the influencer?'

"Education by definition implies that it must first and foremost be to the advantage of the educatee, and of course, of society in general.

"Health education as I have defined it, can and should happen anywhere and everywhere, wherever management and labor come together; wherever a human life touches another human life; every poster or shop announcement if made with respect and understanding of the human mind may be education; every doctor and nurse, patient contact, may help a man to take better care of himself and his family. Every interview with the foreman or personnel director or other executive has the potentiality of building self-esteem and morale.

"As an educator, it is a little hard for me to think of education as being good business, but I am convinced that in an honest society, every means of helping people to live better lives is good business."

Speeches by other members of this panel will be summarized in the May issue of the *Newsletter*.

BAL THERAPY IN LEAD POISONING

*A Review of the Literature**

During the war, Peters, Stocken, Thompson, and their associates developed and studied a new compound 2,3-dimercaptopropanol, commonly called British Anti-Lewisite or BAL and also called dithiopropanol (*1,2*). Because of the marked affinity of its -SH groups for arsenic, BAL has been used extensively in the local and systemic treatment of arsenic poisoning (*3*). The logical extension of this work was the trial of BAL in poisoning by other metals which might resemble arsenic in forming stable cyclic linkages with BAL (*4,5*).

Although BAL has proved effective in many kinds of heavy metal poisoning, the published evidence to date in regard to lead is not at all conclusive. Using rabbits as the experimental animal, Braun and his coworkers injected a single dose of lead nitrate intraperitoneally and then treated the animals with 10 mg./Kg. of BAL intramuscularly daily for 10 days. "The data indicated that the treated animals were more susceptible than the controls" (*4*). In a chronic experiment they injected 15 mg./Kg. of lead nitrate intraperitoneally daily for 14 days, allowed 7 days to elapse, and then treated the animals with daily intramuscular injections of 6 mg./Kg. or 10 mg./Kg. of BAL. "Within the 30-day period of the experiment, all of the treated animals died while all the control animals survived." As a consequence they felt that BAL enhanced the toxic effect of lead (*4*). However, in a continuation of these studies, they injected 20 to 40 mg./Kg. of lead acetate intravenously and then treated the rabbits with subcutaneous injections of BAL starting with 30 mg./Kg. and decreasing thereafter. This time they found that "BAL reduced the toxicity of intravenously administered lead acetate by 50%" (*6*).

Also using rabbits, Germuth and Eagle produced lead poisoning by five consecutive daily subcutaneous injections of 240 mg./Kg. of lead acetate in one series of animals and by 4 intravenous injections at 3-hour intervals of 12 mg./Kg. of lead acetate in another series. "The intramuscular administration of BAL in peanut oil and benzyl benzoate, at individual dosages of 5 to 20 mg./Kg. and repeated every 4 hours failed to protect animals poisoned with lead acetate by either route of administration." In fact in the subacute experiment, "the animals treated with BAL died significantly faster than did the corresponding untreated controls" (*7*).

Chiodi and Sammartino gave lead acetate to white mice by stomach tubes and treated them with 33 mg./Kg. of BAL intraperitoneally twice a day. The BAL almost completely prevented an increase in the weight of the kidneys observed in the controls but did not prevent the concomitant anemia (*8*). Graham and Hood injected lead acetate intraperitoneally into white mice. Treatment with 40 mg./Kg. of BAL intraperitoneally increased the toxicity of the lead salt as shown by a decrease in the LD 50 from 461 mg./Kg. to 416 mg./Kg. (*5*).

Weatherall poisoned white mice by repeated intraperitoneal injections of lead acetate and found that "the mortality was reduced slightly by BAL and significantly by BAL glucoside." In another series of experiments, this time with rabbits given a single dose of lead acetate by stomach tube, "the mortality was apparently unaffected by BAL, but was reduced by BAL glucoside." However, "the number of rabbits was too small for this difference in mortality to be significant," although the BAL and BAL glucoside did significantly decrease the anemia and increase the coproporphyrinuria (*9*).

There have been very few reported cases of lead poisoning in human beings treated with BAL. Telfer treated a seaman exposed to lead paint for many years but with a brief history of gastrointestinal symptoms. The clinical course showed no relationship between the gradual recovery and the two courses of BAL therapy one consisting of 12 intramuscular injections of 1.9 mg./Kg. (10 percent in oil) over a 3-day period and a second of 2.5 mg./Kg. 4 times a day for a total of 19 injections. No adverse effects of significance were noted, but the urinary excretion of lead was definitely increased each time. The author concluded that "BAL is deserving of further trial as an aid in diagnosis and as a useful drug in the treatment of lead poisoning" (*10*).

Kehoe and his associates in a brief report summarizing their experience concluded that "the effects of the administration of dithiopropanol are unique in our experience and are of potentially great physiological importance. However, their significance at this time should not be lightly credited to the field of therapy since the intensity and brevity of the single response is such that no quantitatively important proportion of the absorbed lead of a poisoned or endangered individual has been removed thereby from the body. We have been unable to shorten the clinical course of lead intoxication, to maintain a significantly increased rate of elimination or to decrease the duration of the occupational disability of affected men by repeated doses of the drug because of the induction of hypertension, annoying local or generalized immediate reactions, or delayed muscular aching. We also wish to emphasize that dithiopropanol is potentially a dangerous drug and the lead intoxication is largely a self-limiting disease."

In another brief report by the same authors, they reiterate "dithiopropanol is of no value in the treatment of acute poisoning in adults due to inorganic lead. We have observed that the drug, in contrast to the lack of clinical effect on the symptoms of poisoning, causes a transient decrease in the erythrocyte-lead concentration and a temporary increase in the urine-lead concentration to a degree we have not seen with other type of therapy" (*12*).

Conclusions: The experimental work on animals is too dissimilar to be properly compared or summarized. The results so far are conflicting even in work done by the same group of investigators. The possible toxicity and untoward reactions reported in some instances have not been considered of sufficient importance to deter some clinicians from experimenting further with BAL in cases

*Prepared by the Clinical Investigations Branch, Division of Industrial Hygiene, USPHS.

of lead poisoning. For example a carefully controlled study of the value of BAL utilizing intramuscular dosages of from 2 mg./Kg. to 3 mg./Kg. every 4 hours for cases of acute lead poisoning in children is currently underway in the pediatrics departments of the Johns Hopkins Hospital and the Baltimore City Hospital. Preliminary results are sufficiently suggestive and adverse effects sufficiently rare to warrant a continuation of this study (*13*). Additional properly controlled studies of the use of BAL in acute and chronic lead poisoning in adults seem indicated. It may well prove to be that BAL is not the answer but merely a prototype of a chemical yet to be developed which will have the same affinity for lead but in addition will possess other properties which will make its therapeutic effect conclusive.

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ACTIVITIES OF ORGANIZED LABOR IN HEALTH FIELD

Trends in the objectives and activities of organized labor in the health field are shown in recent announcements of two of the largest unions in the country.

At the last meeting of its executive board, the United Automobile Workers of America-CIO unanimously adopted the following objectives for their 1949 collective bargaining negotiations:

"1. An adequate pension and retirement program.

"2. A comprehensive social security program, including health, hospitalization, medical, surgical, and life insurance provisions.

"3. A wage increase to restore the buying power of wages to the level of June 1946."

Later in January at the United Automobile Workers International Educational Conference the social security proposals were amplified. The local union representatives at the conference were advised to ask for:

(a) One hundred percent employer financing by means of a specified percentage of pay roll. Although no percentage was announced, the opinion was expressed that 10 to 15 percent would probably be needed for a comprehensive social security program. However, 5 percent was considered to be the smallest practical amount for starting a program.

(b) A social security trust fund governed by a board composed of an equal number of representatives of the union, the employer, and the public. It was urged that only the most general description of benefits be included in the collective-bargaining agreement itself. The detailed formulation of the social security program would be the responsibility of the board of trustees. They would select from all the various possibilities the amount and type of benefit provisions which, when combined, would best meet the needs of the workers. Further, the trustees should have the authority and responsibility to conduct an organized review of all phases of the program at regular intervals and to make such improvements in the quality and efficiency of the benefits as proved necessary.

For the different social security benefits, the UAW recommended the following priority:

(1) Income maintenance during periods of lost-time due to nonoccupational sickness or accident.

(2) Hospitalization protection for the worker and his family.

(3) Medical and surgical services for the worker and his family.

(4) Life insurance for the wage earner.

The United Mine Workers Bituminous Welfare and Retirement Fund recently announced that its Medical, Health, and Hospital Service has started full operations. Dr. Warren Draper, former Deputy Surgeon General of the USPHS, and a member of the A. M. A. Council on Industrial Health, is the executive medical officer. Ten administrative physicians and a like number of technical assistants have reported to 10 district offices. They have been instructed to work out a complete program of medical care for miners and their families. This program will be developed gradually, as it will be impossible to meet all the demands for some time to come.

Each regional office will function as a clearing house which will make arrangements and pay for the treatment of eligible persons. Actual medical care will be performed by practicing physicians and hospitals near the homes of the patients. At first, medical care will be provided only to disabled or unemployed miners, their dependents, and pensioners of the welfare and retirement fund. The complete cost will be paid by the welfare fund, which is financed from a 20-cent-a-ton royalty on each ton of coal produced. The fund is administered by a tripartite board of trustees.

The Work of State and Local Industrial Hygiene Agencies

Victoria M. Trasko, USPHS

To keep the health of the Nation's labor force from being expendable is a direct responsibility of State and local industrial hygiene agencies in the country. How well this responsibility is carried out may be ascertained from the annual reports of 45 of these agencies in 38 States. They strongly bear out the fact that no other public health field presents such a multiplicity of problems and situations involving the health and welfare of so large a segment of our population or offers such diversified activity.

ADMINISTRATIVE ORGANIZATION

At present 58 State and local industrial hygiene units are functioning on a full or limited basis in 44 State health departments, 2 State labor departments, 8 local health departments, the District of Columbia, and the territories of Hawaii, Puerto Rico, and Alaska. The appropriations for 1948 fiscal year totaled $2,500,723 of which 53.5 percent was derived from Federal sources, and 46.5 percent from State and local sources.

Approximately 400 professional personnel are employed by these agencies. Of this number 66 percent are engineers and chemists, and another 11 percent are sanitarians and inspectors. Physicians make up 10 percent of the total number and nursing consultants, another 10 percent. The remaining three percent consist of a miscellaneous group of professional and technical personnel.

In addition to direct industrial hygiene services, the agencies are able to bring to industry more or less complete health programs by integrating their work with that of other divisions in the State government, such as sanitation, venereal disease, and tuberculosis control. When feasible, they maintain working relationships with local health departments in their investigative work in industries in their areas, and utilize their facilities as headquarters for branch offices. They cooperate with labor departments and industrial commissions through exchange of reports of occupational diseases and reciprocal arrangements for field investigations. Cooperative relationships are also maintained with professional organizations such as the medical societies and nurses' organizations, particularly concerning in-plant health services. The agencies work, too, with labor unions in enlisting management and employee cooperation and in arranging for studies and health services.

State and local programs are integrated with that of the Division of Industrial Hygiene, U. S. Public Health Service, through such activities as consultative services on administration and technical phases of programs, the application of standard practices, and in the conduct of research field studies.

FIELD SERVICES

Most of the field activities are devoted to routine investigations and evaluations of environmental health hazards and recommendations for their control. When the agencies are staffed with medical and nursing personnel, the services are extended to medical evaluations of industrial diseases, and to improvement of in-plant health programs.

During 1948 (fiscal), the 45 State and local agencies located in 38 States gave 37,336 different services to 25,700 industrial establishments, involving 5,938,470 workers. Although this is more work in terms of numbers than has been reported for the country at any other time, the coverage of workers remains low. The estimated labor force in the 38 States with divisions of industrial hygiene covered by this report is approximately 55,000,000, indicating that these agencies reached only 11 percent of the labor force in their States.

Of the 37,336 services which were reported, those dealing with environmental control predominated, accounting for approximately three-fourths. This predominance is not surprising as the divisions are staffed with a large proportion of engineering and chemical personnel.

Atmospheric pollution control.—In the past, investigation of so-called nuisance complaints, especially those dealing with atomospheric contamination, was a routine though comparatively minor activitiy of most industrial hygiene agencies. Today, it is fast becoming one of their important activities. This growing emphasis is due in part to the transcendence of atmospheric pollution from the nuisance stage to problems of public health implication. The Los Angeles smog and the Donora disaster, among other local and less publicized situations, have focussed much attention on problems of this nature, making people more aware of air contamination than ever before, and demanding action for its abatement.

Among other industries which have been investigated because they were polluting the atmosphere are lead smelters, metal reclamation plants, chemical plants, talc mills, stone crushing mills, paper mills, rendering and fertilizer plants, and varnish cookers. Even food products such as rice, alfalfa, and other grass crops prepared for stock feeds were found responsible for nuisance dust problems.

Radiation.—The utilization of atomic energy is of paramount interest to industrial hygienists in the State and local agencies. At present very little use is made industrially of radio-active isotopes apart from radium and other naturally occurring ones. Yet the problem, because of its insidious health implications and forecast for industrial use, makes it necessary that every agency be prepared to provide assistance or assume leadership when the time comes.

Thus far, technical studies are limited chiefly to the evaluation of possible health hazards from excessive or stray radiation involved in luminous painting, static eliminators, industrial X-ray installations, shoe store fluoroscopes, and in laboratories and clinics where X-ray pictures are taken. Plants using radium paint, as in dial painting, are under the constant surveillance of industrial hygienists. This has been found necessary as several of the divisions recently noted a laxity in safe health practices established during the war.

Agriculture.—The introduction of new toxic chemicals and the addition of mercury and organic compounds in seed treating, fertilizers, insecticides, and fungicides have drawn the attention of

industrial hygiene officials to the potential health dangers in the agricultural industry. Many places of employment were visited to determine the extent to which the toxic chemicals are being used and whether or not adequate control methods are in force.

Environmental control.—The annual reports mention numerous studies of the familiar types of occupational hazards such as lead and silica exposures in potteries, fumes and dusts in foundries, solvents in degreasing operations and in dry cleaning establishments; exposures to abnormal factors in the environment such as excessive temperatures and humidities, continuous vibration, and improper lighting in offices and schools.

New methods in processing food products are not without their hazards, many of the activity reports reveal. The use of ultraviolet lamps for prevention of mold and bacterial contamination of products, especially meat, is growing more common. Many of the studies revealed exposure to excessive radiation from the lamps resulting in serious eye irritation among the persons exposed.

The unguarded use of potentially toxic fumigants was among other common investigations. For instance, a study was made in a plant using methyl bromide for fumigating various food products and raw materials for vitamin preparation. It was found that no means were provided for removing the methyl bromide vapors before the workers entered the fumigating chambers, thus endangering their lives. It was necessary for the industrial hygienists to devise ways for controlling this exposure.

The carbon monoxide hazard in garages, automobile repair shops, buildings and even in homes creates much work for industrial hygiene divisions. Many times these investigations are made only after persons have been overcome by carbon monoxide gas. Among the reasons for dangerous conditions are improper installations in homes and in buildings, poor ventilation in garages, lack of adequate exhaust ventilation and the use of gasoline power-lift trucks in enclosed areas. Because there are such large numbers of automobile repair shops and garages, several divisions have prepared bulletins for distribution outlining hazards and means for their control.

Every year some division reports the investigation of cases of deaths or illness due to lead poisoning among children as a result of burning old storage battery boxes as fuel at home.

At the request of the Industrial Commission the Florida division investigated 3 deaths from hydrogen sulfide poisoning in a well in the Everglades. This study resulted in the writing of preventive procedures for the protection of well cleaners.

IN-PLANT HEALTH SERVICES

An extensive variety of activities was likewise reported by medical and nursing personnel in the State and local industrial hygiene agencies. In addition to medical evaluation and assistance with diagnosis and treatment of occupational illness, considerable work was done in assisting individual plants in organizing or improving health services for their workers. There is no doubt that industry is growing more "health conscious," but progress in getting more industries to start in-plant health programs is frequently hampered by lack of professional personnel. The South Carolina division reported the establishment of 13 new health programs with medical and full-time nursing services; Tennessee reported that 17 plants for the first time employed graduate nurses for their dispensaries.

LABORATORY SERVICES

In connection with the field studies of occupational hazards, a total of 39,665 laboratory examinations and tests was reported by 40 units. These consist of analyses of air-borne contaminants, materials used in industrial processes, and biological materials. Sometimes the tests are made directly in the field in order to determine the degree or extent of contamination of gases, solvents, and other air-borne contaminants. These are not always recorded, but 37 agencies reported over 15,656 measurements of this type. Thirty-five divisions reported 14,633 other measurements of physical conditions, such as ventilation velocity, illumination, and radiation.

Simultaneously with routine analytical work, several laboratories are evaluating and developing new methods of analyses as well as improving old methods for the determination of toxic ingredients. Among the projects mentioned in the reports are improvements of methods for: testing and analyzing samples for chlorinated hydrocarbons; microanalysis of body fluids for beryllium; evaluation of arsenic exposures in insecticide plants; and determination of mercury, sulfur dioxide, acetaldehyde, fluorides, chromium, and cobalt. As funds permit, the agencies are installing in their laboratories specialized equipment, such as spectrographs, polarographs, and X-ray diffraction apparatus, enabling them to do highly specialized analyses on crystal structure and trace elements.

OCCUPATIONAL DISEASE REPORTS

Reports of suspected or confirmed cases of occupational illness serve as a valuable source to industrial hygiene divisions for investigating existing health hazards. The value of such reports to workers and employers is illustrated by the account of a follow-up of two cases of lead poisoning reported in a ceramics plant employing 350 workers. The industrial hygiene division which investigated the report learned from interviews with physicians attending the patients and other community physicians that there were several other cases which had not been reported as being of industrial origin. At the same time, a community chest X-ray survey uncovered several cases of silicosis which gave histories of employment at the plant. Technical studies by the local industrial hygiene division revealed that practically every production employee was exposed to silicosis or lead poisoning hazards and that management was not aware of the extemely severe health hazards in this plant. As a result of these studies the company installed dust control equipment worth thousands of dollars. A workers' health service,

with a registered nurse in charge, was also inaugurated in order to prevent further occurrence of occupational illness. This is an account of one case. There are many other instances similar to this one.

EDUCATIONAL ACTIVITIES

Industrial hygiene work does not stop with field and laboratory services to industry. Every reporting agency devotes considerable effort to informing labor, industry, civic and professional groups about different phases of industrial health. Various media, such as bulletins, posters, radio, exhibits, films, and institutes are utilized in furthering these informational and educational activities.

Numerous divisions publish their own news bulletins which are distributed to industry and other interested persons and organizations. In the past year, they prepared and issued bulletins on special subjects such as silicosis, carbon monoxide hazard in garages, manuals on records for plant nurses, and laboratory procedures. One division has just completed a manual on ventilation in industrial establishments. One of the west coast States prepared and disseminated a series of informative bulletins on the subject of toxic insecticides. Another division published warnings for use of the public and responsible authorities on the effectiveness and hazards of ultraviolet and other air disinfectants now in vogue. These are only examples, but it may be seen that much of this informational service is directed at the general public as well as labor and industry.

The contribution of industrial hygiene agencies to training of personnel is likewise substantial. The need for industrial hygiene personnel, coupled with formal educational facilities, makes it necessary that staff members assist with the teaching of industrial health subjects. Over one-half of the reporting agencies indicated activity in this field. In addition to lecturing and assisting with development of curricula, they make available their laboratory facilities for demonstration purposes, and arrange for in-plant orientation with appropriate industries. The practice of employing university—especially medical—students for part-time work or during their vacations is growing more popular. On this subject the West Virginia report makes the following comment: "As a result of this brief indoctrination into the field of industrial health, they have a better understanding of industrial health problems. In highly industrialized States, it appears very desirable that every medical student who plans to practice, whether as a private practitioner or industrial physician, should be given some training in industrial hygiene."

FACING FACTS

An accounting of the accomplishments of State and local industrial hygiene agencies is only one side of the story. The annual reports also mention another side—the one dealing with their problems and shortcomings in the face of a rapidly expanding field.

The first deterring factor in the development of rounded programs and the provision of adequate industrial health services is insufficient funds. The second deterring factor is the shortage of personnel, especially medical and nursing, which still haunts most of the agencies. These are familiar problems of long standing. Were it not for the mounting number of conditions and factors which are creating more and more work, these agencies could continue at their present pace and still discharge to a limited extent their responsibilities. But industry is not static, and since they are the only State and local public agencies dealing directly with industrial health problems, the brunt of modern advances naturally falls on them. The continuous development and use of new chemicals, products, and processes make it necessary that industrial hygiene agencies be always on the alert for implied or suspected health hazards, even undertaking experimental work to determine the nature of potential toxicities.

Another factor responsible for creating more work for the agencies is the growing interest on the part of industry and labor in positive health programs and better working conditions for workers. This interest is commendable, and has proved to be economical.

The growing demand for assistance with atmospheric pollution control problems has already been mentioned. The recent Donora disaster will no doubt influence the assumption of industrial hygiene responsibility in problems of this nature. In discussing the need for legal as well as technical responsibility for this work, the Illinois report commented: ". . . without State action, few of the nuisances are being abated satisfactorily. The appreciable increase in interest in air sanitation indicates that this Division will have to assume greater activity in this field and develop more resources for their effective evaluation."

Industrial expansion, coupled with high construction costs, is likewise responsible for increasing demand for evaluation of potential health hazards in plants, examination of blue prints for ventilating and other equipment, and for industrial health information.

The influence of new legislation and agreements pertaining to industrial health is another factor placing a greater workload on these agencies. For instance, in Michigan, substantial work has been created as the result of an agreement with the State labor department for investigation of all matters relating to health. Also, as a result of new legislation, the division is required to make yearly investigations of all dry-cleaning establishments using synthetic solvents before licenses can be issued for their operation. In other States the passage of new or amended occupational disease compensation laws is stimulating interest in industrial health, with a resultant increase in the demand for services by industry, prompted by the economic desire to lower compensation costs as well as to further the health of the worker.

And finally, the possibility of the enactment of local health legislation for the expansion and development of local health departments portends the assumption of more activity on the part of local health units in industry. This will need to be done with the assistance and guidance of the State industrial hygiene divisions. Even though the vast majority of local health departments cannot justify specialized industrial hygiene programs of their own, it has already been demonstrated that they can give valuable assistance in coordinating the industrial health program with community health activities. The State agencies will need to assist with the training of personnel and with the planning of full-time programs when these are justified by the size of the labor force. In other units, cooperative working relationships will need to be developed in order to serve workers in those areas more rapidly and effectively.

PROTECTING THE HEALTH OF TUNNEL WORKERS

Alex E. Goss, Bureau of Industrial Hygiene, Connecticut Department of Health

During 1948, construction work was begun on the last link of a four-lane super highway between Hartford and New York City. The Merritt Parkway, a four-lane super highway from West Haven to New York City, has been completed for a number of years. The Wilbur Cross Parkway from Hartford to New Haven was opened last year. The connecting link between the Merritt Parkway and the Wilbur Cross Parkway is a twin-bore vehicular tunnel of approximately 1,200 feet through West Rock and an approaching roadway of approximately 6 miles. The tunnel excavation has been completed; lining of the tunnel, building of the roadway, and construction of the ventilation shaft are progressing.

The twin tunnels will run in a northeasterly direction on a 3-percent upgrade. The finished bores will be 28 feet wide and 18½ feet high. The twin tunnels are separated by a 30-foot rock pillar.

At the center of the tunnels a horizontal cross-cut about 20 feet in width has been driven, thus connecting the bores. From the center in this crosscut a shaft will be raised about 175 feet to the surface. When finished, the shaft will house 4 compartments, 6 feet in diameter that will serve as the ventilation ducts of the tunnels. Each circular compartment will be connected to an exhaust type fan that is operated through a continuous automatic carbon monoxide detector.

Control of Potential Hazards to Health

At a meeting of the State highway department with the contractor and all parties interested in the health and safety of the workers during the construction of the tunnel, the bureau of industrial hygiene of this department outlined the procedures which would be followed in the study and control of conditions which might adversely affect the health of tunnel workers on this project. Findings were to be reported directly to the resident engineer of the State highway department with copies for the contractor.

The rock encountered in the excavation is of a basic igneous type coming under the general classification of trap rock. Chemical and petrographic analyses showed that it contained less than 5 percent free silica. When samples of the test holes were analyzed for free silica content, the No. 1 test hole showed 40 percent. This was doubtless due to surface rock of different composition than the main rock formation.

Drilling.—The entire face of the tunnel bore was drilled with a 60-hole round in one operation. Holes ranged from 12 to 13 feet in depth and advances averaged about 11 feet. To accomplish this speedily and efficiently, two drill jumbos were provided. Each jumbo was equipped with three platforms from which a total of 14 automatically fed, drifter-type, compressed air drills can be operated simultaneously. The two jumbos, when set for drilling, occupy the entire width of the bore with the exception of about 3 feet adjacent to each side wall and a 4-foot gap at the center. The top platform of each jumbo carries only 1 drill but the other floors have two, thus accounting for 7 drills on each jumbo. All drilling was done wet. This control measure reduced the dissemination of rock dust in the tunnel well below the threshold limit for safe working conditions for this type of work.

Hard Rock Workers and Jumbos with Drill Platforms

Determining Atmospheric Dust Concentrations in Vicinity of Diesel Powered Shovel

Ventilating Equipment for Supplying Air Tunnel

Both jumbos were moved in and out of the bores under their own power. To protect the health of tunnel workers, it was recommended that use of their engines be limited to this movement. This was necessary because one jumbo was gasoline-powered.

Air for the drills was furnished by six Diesel-powered, portable-type compressors, allocated on the outside not far from the tunnel portals.

Mucking.—As soon as blasting fumes and smoke had cleared, the bulldozer was put to work brushing scattered rock back toward the muck pile. The Diesel-powered shovel was then brought up to the muck pile, the broken rock loaded into one of the Diesel-powered dump trucks and hauled to the approach where it was used as "fill."

Ventilation.—Mechanical ventilation was provided by means of two electrically driven centrifugal fans, which supplied air to each of the two tunnels under construction. In addition, there was another fan which could be used for supplying air to or removing air from the tunnels. This equipment was located outside the portals at a point about midway between projected lines of the bores and some 60 feet from the portals.

The fan ducts were suspended at a height of about 7 feet by attaching them to posts of the steel ribs and reached to a point about 135 feet from the face of the bore. Each fan delivered approximately 10,000 cubic feet of air per minute. Smoke caused by blasting was blown out. This required about 30 minutes. Permission to enter a bore was not granted until a definitely clear condition was evident.

The total equipment used in the tunnel during mucking at this time was rated at about 220 horsepower. At 75 cubic feet per minute per horsepower, the air needed to be exhausted was 16,000 c. f. m. This was equal to that being exhausted and the air at this time was clear.

Automotive Equipment in Use.—The following automotive equipment was used in the various operations necessary for advancing the bores. At no time were there likely to be more than three pieces of Diesel-powered equipment in operation in a bore at any one time.

The Diesel-powered equipment used during mucking consisted of one caterpillar shovel and three 8-ton dump trucks. None of the foregoing equipment was fitted with special devices for washing or diluting exhaust gases or arresting sparks. The Diesel fuel used was a high-grade oil relatively free from sulfur.

The use of Diesel or other internal combustion engine equipment in tunnel construction presents potential health hazards from the discharge of toxic or objectionable constituents of the exhaust gases. There is the additional hazard of operating this equipment in explosive atmospheres, such as methane. Due to the characteristic type of construction and rock formation at West Rock Tunnel, no precautions were necessary. The toxic gases from the exhaust included carbon monoxide, nitrous oxides, oxides of sulfur and aldehydes.

The advantage of the Diesel over the gasoline engine in underground work is the small concentration of carbon monoxide in the exhaust gases, provided the fuel-air ratio is kept below 0.068 pounds of fuel per pound of air. The Diesel engine is usually operated at full load on a fuel-air ratio of 0.055 pounds. At this ratio, the carbon monoxide in the undiluted exhaust gases is usually less than 0.25 percent by volume. The U. S. Bureau of Mines has recommended that figure as a criterion of well-operated Diesel equipment.

In our experience, the Diesel equipment in operation at the West Rock Tunnel showed by chemical analysis of exhaust gases the following results:

Type of equipment (Diesel-powered)	Percent carbon monoxide
Shovel	0.015
Bulldozer No. 7	.40
Bulldozer No. 43	.015
Dump truck No. 1	.015
Dump truck No. 2	.020
Dump truck No. 3	.030

It was noticed that whenever the bulldozer No. 7 was inside the tunnel, the workers complained of fumes. We recommended that No. 7 bulldozer be removed from tunnel work. Operation with a deficiency of air, resulting in excessive concentrations of carbon monoxide, was accompanied by quantities of smoke in the exhaust. Smoke was not observed in the exhaust of Diesel equipment when operated in proper mechanical condition and with correct fuel-air ratio.

The exhaust gases of Diesel equipment also contain oxides of nitrogen. We made a few tests of the exhaust gases of the Diesel dump trucks and found 30–40 p. p. m. With the tunnel ventilation that was provided, the oxides of nitrogen were kept below the threshold limit for safe working conditions.

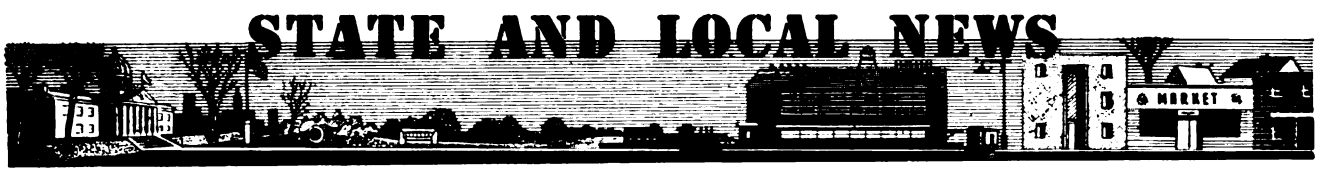
PORPHYRIN TEST FOR LEAD POISONING

Significance of porphyrin in urines in the early diagnosis of lead poisoning was described in a recent article in a Scandinavian medical journal. The authors, de Langen and ten Berg, believe that the amount of porphyrin in urine is a much more reliable test for early detection of lead poisoning than the basophilic aggregation test or stippled cell counts.

Urine with increased amount of porphyrins shows, when acidified with acetic acid and shaken with ether, a red fluorescence in the ether layer when held before the ultraviolet light of a Wood lamp. A normal porphyrin concentrate shows blue or green fluorescence and is called 0. A slight increase, 1+; moderate increase, 2+; and strong and very strong increase, 3+ and 4+, respectively.

If, as the authors believe, "porphyrinuria is the first sign pointing to lead poisoning," we have a very simple and valuable addition to assist us in our control of lead poisoning in industry. Porphyrin tests on urine of workers exposed to lead are being made at the Bureau of Industrial Hygiene. The results are being compared with basophilic cell counts, with the amount of lead in urine, and the lead concentrations in the workroom areas in an endeavor to determine the value of the porphyrin test. If the results of the porphyrin test can be satisfactorily evaluated, we will have a simple screening method that may be utilized by plant medical departments.

Reprints of the article by de Langen and ten Berg may be obtained upon request to Connecticut State Department of Health, Bureau of Industrial Hygiene, 1179 Main Street, Hartford 1, Conn.



CONNECTICUT

Conference.—A nurse-management dinner was held March 1 in Hartford, Conn., sponsored by the Hartford branch of the New England Industrial Nurses Association. Miss Mary Delehanty, R. N., President, American Association of Industrial Nurses, spoke on the achievements and aims of the association. Judge Harold K. Watrous of Hartford discussed the Connecticut compensation laws.

Position open.—An industrial nursing consultant position is open in Connecticut. Experience in industrial nursing and public health nursing is required. For further details please write to: Connecticut State Department of Health, Bureau of Industrial Hygiene, 1179 Main Street, Hartford 1, Conn.

Publication.—"Ferrous metals" is the subject of the latest Industrial Health Bulletin, Vol. 3, No. 4.

MARYLAND

Personnel.—Mr. Raymond Smith, engineer in the Division of Industrial Health of the Maryland State Department of Health, spent the month of February working with industrial hygiene personnel in the Connecticut Department of Health. The purpose of this visit was to study and observe the operations as carried out in that State and to acquire general experience in industrial hygiene work.

MASSACHUSETTS

Conferences.—A session on industrial hygiene was a part of the Massachusetts Safety Conference on March 15 at the Hotel Statler in Boston. Among the speakers were Mr. Manfred Bowditch, Director of Health and Safety for the Lead Industries Association, who discussed certain aspects of the lead problem, and Dr. H. H. Schrenk, Chief, Environmental Investigations Branch, Division of Industrial Hygiene, USPHS, who talked on atmospheric pollution.

Lectures.—Members of the staff of the Massachusetts Division of Occupational Hygiene have given talks recently, including Mr. John B. Skinner, Director, who spoke on "Industrial Hygiene" at the University of Massachusetts, Amherst, and Dr. Hervey B. Elkins, who spoke on "Recent Experiences with Industrial Poisons" before the American Society of Safety Engineers, Cambridge. Dr. Harriet L. Hardy addressed the annual meeting of the Consumers League in Boston and also lectured on "State Control of Occupational Illness" at the Harvard School of Public Health.

MISSOURI

Seminar.—An industrial hygiene seminar sponsored by the Industrial Hygiene Bureau of the Missouri Division of Health was held in Jefferson City on January 6–7, 1949. Attending were representatives from the Industrial Hygiene Section, St. Louis City Health Department, the Kansas City area Industrial Hygiene Service, and the U. S. Public Health Service District No. 7. A variety of subjects were presented for discussion by representatives from each of the industrial hygiene units.

MONTANA

Service to Physicians.—To promote industrial health education and activities among the medical profession in the State, a conference was held with Dr. R. B. Richardson, chairman of the Industrial Welfare Committee of the Montana Medical Society. The following program of action was agreed upon:

1. Inform the medical profession of the activities of the Industrial Hygiene Division and the services the division offers to them. Explain the importance of occupational disease reporting in preventive medicine and the need for better reporting from the doctors.

Articles on this subject are being prepared for publication in the State Medical Society *Bulletin*. One of these has already been published.

2. Have a prominent authority on industrial health speak at the Rocky Mountain Medical Society meeting which will be held in Butte this summer. Approval for this was given by the chairman of the committee on scientific programs.

CO in Garage.—At the request of the U. S. Forest Service, a study was made of the cause of headaches among employees in the Forest Service garage in Missoula the main garage for the northern region, which covers Montana, Idaho, Washington, and Oregon. The results showed the problem was primarily in the office, where the employees spend three-fourths of their time, where the concentration of carbon monoxide gas varied from 50 to 100 parts per million throughout the day. Although much higher concentrations were obtained in the garage itself during the worst conditions, leakage through the building and drafts through the doors when they are opened quickly reduced the carbon monoxide concentrations below those found in the office.

To correct these conditions, preheated fresh air will be brought into the office so that there is a slight positive pressure which will prevent air from the garage proper from entering the office room. In addition, the illumination in the office is to be improved to meet standard requirements.

Introduction to Industry.—Through the cooperation of the Health Education Division, an educational program is being conducted on the activities and services of the Industrial Hygiene Division. Starting in Billings, a member of the Educational Division has been visiting plants with 50 or more employees, with very fruitful results. Out of eight plants visited, only one had ever used the services before. Two companies showed particular interest, one in relation to plans for a new addition to the plant; the other, in the program in general. In all plants, literature and posters on general and industrial health were left. A number of the plant managers wished to receive the *Industrial Hygiene Newsletter*.

After all plants of significant size are covered in Billings, the health educator will continue this program in the Great Falls area.

NEW HAMPSHIRE

Nurses.—Newly elected officers of the New Hampshire Industrial Nurses Association are: President, Mrs. Esther Parker; vice president, Mrs. Nina Collins; secretary, Miss Irma Taylor; treasurer, Miss Hazel Downing; publicity, Miss Margaret A. Kirk; membership, Miss Elizabeth McHugh; finance, Mrs. Priscilla Cummings; education Miss Lillian Sulloway. Board of directors: Miss Lillian Sulloway, Miss Ella Minzey.

WISCONSIN

Nursing.—The School of Public Health Nursing, Marquette University, Milwaukee, is offering its annual course in industrial nursing during the period from February 7 to May 23, 1949. Credits are given for this course with classes held one night a week. The subjects offered are as follows: (1) Organization and functions of the industrial medical department, 4 lectures; (2) Industrial nursing practices, 2 lectures; (3) Occupational disease control, 4 lectures; (4) Nursing care, 2 lectures; (5) Rehabilitation, 1 lecture; and (6) Community resources, 1 lecture.

Seminar.—The 4-day Industrial Nurses Seminar, held at the University of Wisconsin, was limited to approximately 20 nurses to encourage individual participation in the discussion periods following each lecture. Twenty-five nurses registered for the seminar. The lectures were well attended, and each nurse was able to gain much useful information on her own problems through participation in the discussion periods as well as from the lectures.

RECOMMENDED READING

Halliday, J. L.: Psychosocial Medicine, a Study of the Sick Society. W. W. Norton & Co., New York, 1948. 278 pp.

McMahon, J. F.: What's happening in industrial health? *Advanced Management* December 1948. 4 pp. (Reprints available from Industrial Hygiene Foundation of America Inc., Pittsburgh 13, Pa.)

U. S. Bureau of the Census: Statistical Abstract of the United States 1948. 69th ed. Government Printing Office, Washington, D. C., 1948. x+1054 pp.

Generation of Arsine From Dross Causes Four Deaths in Indiana

Dross, or more accurately aluminum concentrate, was shipped to an Indiana plant in old steel oil drums. The drums were open on one end and contained 700 to 1,000 pounds of dross. The material was shipped in two boxcars.

This dross was supposed to come from kettles containing white metal. Impurities, such as copper and antimony, were removed by the use of aluminum at the plant manufacturing the white metal, hence the term "aluminum concentrate" for this dross.

Men at the Indiana plant unloaded the boxcars and emptied the steel drums on a concrete floor in the receiving department. Following this, the dross was shoveled for sampling purposes. To accomplish the sampling, the men would place nine shovels of the dross in one area and one shovel in a sample pile. The sample pile was later quartered and requartered in order to get a representative sample.

Such was the work of the day shift. Near the end of the day shift the workers noticed that one of the piles emitted a white fume. This pile was immediately covered with lime. The afternoon shift was used to replace this material back in the drums and take it outside. Some of the men on the day shift became ill before leaving the plant, and by midnight some 10 men were hospitalized. General symptoms were headache, nausea, vomiting, and a very bloody urine. The first man died at 11 o'clock the following day. Within 4 days a total of 19 men were ill and 4 had died.

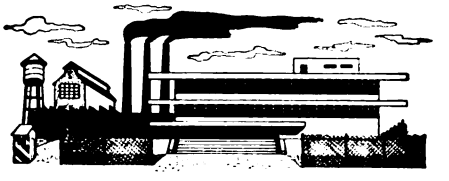
The urine was found to contain arsenic, and arsine was demonstrated as coming from the dross. Under laboratory conditions 100 cc. of the gas trapped in containers was shown to have as much as 1,600 p. p. m. arsine.

The dross contained antimony, arsenic, tin, copper, lead, and aluminum as the prime constituents. Arsenic content varied from 1 to 5 percent. It is believed that aluminum arsenide was formed and on hydrolysis produced arsine. It was noted that some of the material was wet when it was sampled. In the laboratory it is noted that when a sample of the dry and wet dross is mixed an exothermic reaction does occur producing temperatures of near 92° F. with rapid evolution of arsine.

The plant has been receiving this type of dross for a number of years and has never experienced any difficulty. Thus, for this plant it is an accident. However, for the industry as a whole this is not an unknown accident in that Dr. Nau reports practically the same thing occurring twice in the same plant in Texas.[1] The industry should prevent this from occurring again by roasting all such drosses and burning off the arsine, or under controlled conditions permit the hydrolysis to occur prior to shipment.

The investigative work of this accident was done jointly by the Indiana State Board of Health and the Indiana University School of Medicine. Most of the analytical work was done by Dr. R. N. Harger, professor of toxicology of the medical school. Splendid cooperation was given by the plant and its own consultants and industrial hygiene staff.

This is merely a news item and not a finished report. Its sole purpose is again to call attention to the dangers in handling such drosses so that perhaps some other group will not be involved. All such drosses, for the present, should be tested for arsine prior to working this material.—**L. W. Spolyar, M. D., Director, Division of Industrial Hygiene, Indiana State Board of Health.**



COVER PICTURE.—The introduction of new toxic chemicals and the addition of mercury and other organic compounds in seed treating, fertilizers, insecticides, and fungicides have drawn the attention of industrial hygiene officials to the potential health dangers in the agricultural industry. They present potential hazards in their manufacture and also in their application on the farm. The illustration shows a farmer using quick lime for soil sweetening. The caustic lime can burn the skin and injure the lungs if handled carelessly.

—Photograph Courtesy U. S. Dept. Agriculture.

[1] Nau, Carl A.: Accidental generation of arsine gas in industry. *South. Med. J. 41:* 341 (April 1948).

Skin Burns Caused by Cold Trichlorethylene Vapors

Dr. Clarence C. Maloof, physician of the Massachusetts Division of Occupational Hygiene, reports an unusual and interesting case about a worker who received first- and second-degree burns of the skin by cold vapors from an automatic trichlorethylene degreaser.

The day before this episode occurred, a basket of parts fell to the bottom of an automatic degreaser. Preparations were immediately begun to retrieve the parts—the machine was stopped, the steam turned off, and the tank drained of trichlorethylene. The next morning, when the tank was thoroughly cooled off and supposedly drained of trichlorethylene, attempts were made to lift out the metal basket with grappling hooks, but without success. The worker then decided to enter the tank and, by standing on the steam coils, to reach down and retrieve the wire basket and metal parts by hand. Shortly after entering the tank, however, he became unconscious and collapsed, falling onto the heating coils. When he was discovered, the foreman entered the tank and tried to rescue him, but only raised the patient into a sitting position when he also collapsed.

Others were now about and quickly removed both men. The foreman regained consciousness almost immediately, the only apparent residual effect being a blister on the palm of his left hand. The worker had several convulsions and was rushed to the hospital. He regained consciousness shortly after admission and complained of double vision with blurring, and a burning sensation of the skin.

The diagnosis made was first- and second-degree burns of the skin, first-degree chemical burns of both conjunctivae, and corneal abrasion of the right eye. Treatment consisted of pontocaine and penicillin ointment to the eyes, vaseline and compress bandages to the entire body, and penicillin intramuscularly. The patient was discharged on the eleventh hospital day; and after a total of 31 days lost, he returned to work and has not complained of any residual effects as of this writing.

When this case was reported, investigations were conducted to rule out any factors other than trichlorethylene which might have produced these burns. However, after interviewing and examining the patient and after inspecting the degreaser, all findings led to the conclusion that the cold trichlorethylene vapor was the causative agent. In inspecting the degreaser, it was noted that the drainage pipe for the trichlorethylene was located at the side of the tank, and regardless of the length of time allowed for drainage, there would always be one-half inch of residual trichlorethylene. It appears that this residual trichlorethylene was sufficient to produce high enough concentrations to cause rapid unconsciousness, and burns of the skin and eyes.

To guard workers exposed to cold trichlorethylene vapors, in the light of the above case, it is necessary to revise our customary precautionary measures, namely, wearing air-line respirator with safety line attached to the waist and having a fellow-worker stand by in case of an emergency. *Additional* protective measures should now include the wearing of impervious protective clothing and goggles. When these steps are taken, it is believed that no harmful effects will result if a worker must enter a degreasing machine and thereby expose himself to the vapors of trichlorethylene.

Gas From Heater in Tunnel Causes Illness

A request for immediate assistance was recently received by the Massachusetts Division of Occupational Hygiene, involving 24 men who had suffered headache, dizziness, and nausea while engaged in the pouring of the concrete shell in the finished section of the Hultman Aqueduct. Previous surveys of this tunnel construction project revealed no unsafe working practices or conditions which might seriously affect the health of the men. These visits have been reported in the October 1948, and February 1949, issues of the *Industrial Hygiene Newsletter*.

Mr. Harold Bavley went immediately to the scene. Operations were stopped, pending tests by members of the staff, as well as by the Metropolitan District Commission engineers. Upon questioning the workers, investigators learned that during the swing shift on the previous day (4 to 12 p. m.) the workmen, in order to overcome the cold temperature in the tunnel, had lowered in to the tunnel a salamander containing live coke, from which most of the volatile gases had been burned. The temporary diaphragm of the shaft opening was then replaced.

Later a worker inadvertently added some soft coal to the heating unit, thereby causing the evolution of smoke and noxious gas. Seven workers became ill almost immediately, and 17 more were affected at the beginning of the next shift and had to be sent home. The men complained of headache, dizziness, and nausea, but fortunately there were no cases involving loss of consciousness or life. All operations were suspended in this portion of the tunnel until, in the opinion of the Division of Occupational Hygiene personnel, the atmosphere was safe. Pending the arrival of the staff, the diaphragm was removed from the shaft opening, and the tunnel was ventilated by natural circulation of the air. Tests were made for oxygen deficiency and carbon monoxide both with negative results. Ventilation measurements indicated that approximately 5,000 c. f. m. were being circulated through the tunnel after the diaphragm had been removed.

The practice of using salamanders or similar heating devices was condemned both by the Occupational Hygiene Division staff and the MDC engineers. In the future, the rule that no such heating devices are to be used will be strictly enforced.

Opportunities for Research and Training Offered by PHS

The National Mental Health Act, which was passed in 1946 to "improve the mental health of the people of the United States," provides, among other things, for the training of increased numbers of persons in the field of mental health. Under this act the Public Health Service may make grants to public and other nonprofit institutions to provide training and instruction in matters relating to psychiatric disorders.

The Public Health Service also offers training stipends for a limited number of graduate students in psychiatry,

clinical psychology, psychiatric social work, and psychiatric nursing.

Further information on this subject is published in a bulletin, *Training and Research Opportunities under the National Mental Health Act.* It is number 12 in the Mental Health Series and sample copies may be obtained by writing the Public Health Service, Federal Security Agency, Washington 25, D. C.

WISCONSIN PLANS FIVE IN-PLANT CLINICS

The following in-plant health clinics have been scheduled: April 12, the Trane Co., LaCrosse; April 17, the Wisconsin Axle Co., Oshkosh; April 27, the International Harvester Co., Milwaukee; May 12, the Oscar Mayer Co., Madison; and May 24, the Chevrolet Motor Co., Janesville. Plans are being made for additional clinics.

Plant tours, followed by post-tour conferences and talks on specialized subjects in medicine and compensation law, will be featured at these clinics. Representatives of the medical profession, industrial nurses, labor, management, insurance carriers, and safety engineers are invited to attend, and representatives of these groups from States other than Wisconsin are cordially invited.

Sponsored jointly by the State Medical Society and the Industrial Hygiene Division of the State Board of Health, the clinics seek to promote a better understanding of the problems involved in protecting the health and safety of the man working in industry.

For information concerning reservations, write to the State Medical Society of Wisconsin, 704 East Gorham Street, Madison 3, Wis.

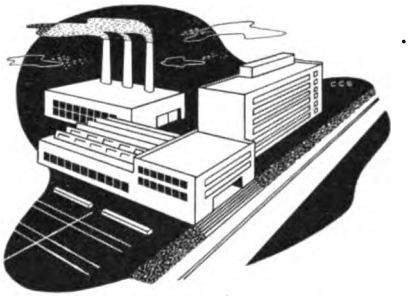
NEW CANCER FILM MADE FOR PHYSICIANS

First in a new series of sound films in color, ***Cancer: The Problem of Early Diagnosis,*** is designed to show that the family physician offers the only immediate hope of reducing the annual toll of more than 180,000 deaths from cancer. The picture begins with Dr. Theodor Billroth's famous operation for gastric cancer in 1881. It portrays graphically the difference made today by early diagnosis of cancer of the stomach, breast, rectum, cervix, and lung.

Five succeeding films will give more detailed treatment to breast, intraoral, lung and esophageal, gastrointestinal, and skin cancer. The series is sponsored jointly by the American Cancer Society and the National Cancer Institute of the U. S. Public Health Service.

Cancer: The Problem of Early Diagnosis is an unusual medical film. It emphasizes highlights, skips unessential details. The camera shows family doctors making examinations and surgeons performing operations. Animation of superlative quality is used to portray what is happening inside the body of the cancer patient. A series of charts dramatizes the reduced mortality rate when diagnosis and treatment are early instead of late.

Correspondence concerning this film should be addressed to National Cancer Institute, Bethesda, Maryland.



KNOW YOUR NEIGHBORS

On the last page of the February issue we showed you a very attractive set of posters with French captions. They were made and distributed by the Health League of Canada, having been created by the staff of the Province of Quebec Division. Credit was mistakenly given in the *Newsletter* to the Canadian Department of Health.

The Health League of Canada is a national voluntary association that has been in operation for 30 years. The work of the League is confined to the education field.

Since the majority of the people who live in Quebec speak French the captions for posters to be used in that area are logically in French. However, the League has pamphlets and other posters printed with English captions and these are available to interested persons in the United States at the same rate as is charged Canadian firms.

For further information write to the Health League of Canada, 111 Avenue Road, Toronto, Canada.

PENNSYLVANIA TO HAVE AIR POLLUTION CONTROL

Provision for the establishment of a division of air pollution control, to function within the Pennsylvania Bureau of Industrial Hygiene, has been made by the State secretary of health.

The problem of air pollution is one that long has troubled industrial communities, and has been intensified by the recent smog disaster at Donora.

Pennsylvania's new Division of Air Pollution Control will be adequately staffed and equipped, with the division chief responsible directly to Dr. Joseph Shilen, Director of the Bureau of Industrial Hygiene. It will cooperate with local air pollution control units already established in municipalities and will initiate surveys and investigate complaints in communities where no such units exist.

This division will start operation as soon as qualified personnel are engaged and funds are made available.

INDUSTRIAL HYGIENE JOURNALS MERGE

On July 1, 1949, *The Journal of Industrial Hygiene and Toxicology* will merge with *Occupational Medicine* retaining its present title for the balance of the year. On January 1, 1950 the name will become *Archives of Industrial Hygiene and Occupational Medicine.*

The publisher will be the American Medical Association and the editor in chief will be Prof. Philip Drinker of the Harvard School of Public Health. He will be assisted by a staff approved and suggested by the American Industrial Hygiene Association and the Council of Industrial Health of the American Medical Association.

The new journal will be larger than the present one but will maintain the same abstracting service and the same type of book notices and reviews. The subscription price will remain at $8.00. All correspondence regarding subscription matters for all issues published after May 1949 should be sent to the new journal, care of the American Medical Association 535 North Dearborn Street Chicago 10, Ill.

Jobside Chats With Charlie

Charlie Craftsman Says, "PUT YOUR BEST FOOT FORWARD."

They say the average person walks 65,000 miles in his lifetime. That's about 10 round trips between Connecticut and California, or two and a half times around the world—some distance! Not too much, though, for people who are smart enough to do their walking on their feet. It's walking on their *corns* that gives folks trouble.

I took a job as a waiter, some years back. Believe me, my feet carried the biggest burden on that job. But I know from other jobs I've held that waiters aren't the only people who have to pay special attention to their feet.

One of my friends on this job was Joe, a good guy who knew all the tricks of balancing trays and checks, and was glad to pass them on.

I thought Joe was set in the job, making good money and getting along well; so I was surprised when he came to my room one night to tell me he was pulling out. His feet just wouldn't take any more punishment, he said, taking off his shoes and socks to show me the damage. I whistled when I saw his feet, all swollen and stuck with adhesive tape and plasters. But I didn't waste time feeling sorry for him. I just grabbed his arm and told him to put his shoes back on—he was going to a doctor. I must have sounded kind of grim, because Joe didn't argue.

When the doc got a look at the bandages and bunion pads on Joe's feet, he whistled, too. "For Pete's sake, did the axe slip?" Joe's face got red.

"Well," Joe said, "these corns bother me so much, I have to slice them off. It's easy to cut them with a razor."

"Corn plasters are safer and easier," the doctor came back, "but when it comes to home-cutting, you'd better think twice. Another thing, did you ever stop to wonder *why* you were getting all those corns?"

"Well, no," Joe answered, "I figured they were sort of a waiter's badge."

"Not a *smart* waiter's badge. Normal feet that are protected by well-fitting, comfortable shoes and socks

needn't develop corns even if they're on the go 24 hours a day. Let's see your shoes."

The doc held up Joe's black oxford. It was a snappy looking shoe. Long pointed toe, thin soles, and a good shine.

"This sparkles, all right, but I can see one reason you've got corns. Your toes can't possibly be comfortable in a narrow triangular space like the toe of that shoe. They have to be squeezed out of shape to get into it. And from the looks of your foot, I'd say the shoe was narrow and too short between the tip and the spot where the shoe bends—the spot that should match the joint of your big toe. You've been putting your feet in jail and they're just paying you back for the punishment."

While the doc talked he was swabbing off the sore places and snipping at toe nails.

"You've got an ingrown toenail, too. That wouldn't happen if you cut your nails straight across and not too short. Don't try to be fancy and cut them round at the corners. They grow into the flesh—and I don't have to tell you they hurt."

"Now put your shoes on, and go home and take it easy. You can relieve that swelling by propping your feet up on a pillow. You'll get quick relief if you wrap a wet towel around each bare foot. And get to a shoe store as soon as you can. You wouldn't use a light pick-up truck for hauling 10-ton loads, would you? Well, get a shoe that's built for comfort while you work. Fancy shoes are O. K. for stepping out. They're torture chambers for long hours of standing. Get a shoe with room for your toes to lie flat. Be sure the distance between the tip of the toe and the bend in the shoe matches the length of your foot from the tip of your big toe to its joint. Don't buy shoes that are too large, either. You need the support you get from a well-fitted shoe. Besides, you might end up with blisters. And another thing, when you buy socks, be sure you get the right size, too. Small ones cramp your toes, and socks that are too large bunch up and cause irritation."

We left and headed for Joe's house. He took it easy for a while and followed the doc's advice about wet packs. He's still a waiter and enjoying it. And his feet take it easy now in shoes that fit him and his work.

HERE IS THE THIRD in a series of articles about Charlie Craftsman, the man in your plant who knows the answers to his health problems. He was introduced in the February number of the *Industrial Hygiene Newsletter*. In the March number he described his preplacement physical examination, concluding with this thought, "I decided those were the right words for the whole preplacement physical exam—playing it safe. And it's sure better to be safe than sick—if you need your pay." You are welcome to reproduce this series of articles and illustrations in your plant paper or magazine. Charlie talks straight from the shoulder to the man and woman in the plant.

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