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FEATURES

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UTAH FIELD STATION READY FOR BUSINESS

An open house held recently marked the formal opening of the new industrial hygiene field station established by the USPHS in Salt Lake City. Approximately 150 guests from the University of Utah and industrial establishments in the vicinity visited the laboratories.

Henry N. Doyle, chief of the field station, and his associate chemists, D. E. Rushing and W. D. Goss, conducted tours and explained the uses for the various pieces of equipment. Industrial hygiene publications were displayed in the library.

The field station is located on the Fort Douglas Annex campus of the University of Utah, at the base of the Wasatch Mountains. The building, which was formerly a medical detachment barracks, has 3,600 square feet of space. The lower floor comprises the chemical laboratory and offices.

The laboratory is completely equipped with new laboratory furniture which includes approximately 100 linear feet of laboratory bench space and two chemical fume hoods. In addition to the main chemical laboratory, there is an instrument room in which are housed such instruments as the balance, petrographic microscope and the dust microscope, a dust view projector and other delicate instruments. The lower floor also contains a storeroom and a service room for the heating system, air compressor, and vacuum pump.

On the second floor there are three office rooms and a library. The remaining space is arranged for a lecture room. The entire building has been equipped with fluorescent lighting so that there are no working areas with less than 40 foot-candles of illumination under the most adverse conditions. The floors are covered with battleship linoleum and the walls are painted a daylight green.

The university provides the physical structure for the laboratory and Mr. Doyle reciprocates by teaching a course in industrial hygiene and engineering to the senior students of the College of Mines and Mineral Resources. He also has given several lectures to the medical students on the engineering phases of industrial hygiene.

With the expansion of industry in the Western States, the need for such a

The Limitation of Exposure to Noxious Gases and Fumes in Industry *

By Lawrence T. Fairhall
Scientist Director, USPHS

A discussion of threshold or permissible limits of exposure to toxic substances in relation to the purpose of this meeting would appear, in a sense, to be somewhat academic. It is only where exposure is unusually severe and fatal or near-fatal that it approaches the condition described as an accident. However, when considered from the long-term point of view, continued exposure to toxic materials is a matter of considerable interest to the safety engineer.

The concept of threshold limits, sometimes designated as "maximum allowable concentrations," has become of increasing interest to the industrial hygienist within the past 20 years. More and more demands have been made for information regarding the toxicity of materials of industry. It might be of interest to review briefly how and why this has occurred.

The history of manufacturing comprises the change from (1) the home workroom, to (2) segregation of workers in one locality, and (3) finally, the consolidation of operations under one roof. The complexity of this change is only apparent when one explores the development of a single industry, such as glass manufacture, tanning, or the forging of iron and steel. The development of a single industry, which was haphazard in the extreme in its initial stages, has progressed as technological advances have occurred until in its present stage of development we have the smooth-flowing assemblage of parts at given centers, followed by the mass production of finished products.

Along with technological advances in industry there have occurred improvements in working conditions. It has become more and more apparent that a healthy worker is a more efficient worker. In the past, however, the improvement in working conditions lagged considerably behind technological advances. Just at the present time the former is rapidly catching up with the latter. This is particularly true in those industries in which workers are exposed to noxious dusts, vapors, gases and fumes.

As more and more information has accumulated regarding exposure to these noxious substances, there has been a concerted effort on the part of industrial hygienists and in industry in general to reduce the amount or extent to which workers may be so exposed. Thus, conditions which were accepted in many manufacturing operations a score or so of years ago would not be tolerated at the present time.

Only a few years ago the amount of carbon tetrachloride in factory air which was regarded as the safety limit in Germany was given at 1,600 parts per million. This figure was later reduced to 1,000 parts per million in this country by the National Safety Council and still later to 100 parts per million by many State industrial hygiene units. Even at this last concentration, workers have been found to develop such symptoms as nausea and headache, and the prevailing feeling at present is in favor of a somewhat lower concentration. In fact, certain States have established a maximum allowable concentration value for carbon tetrachloride of 50 parts per million.

The extent of permissible exposure of human beings to noxious gases, fumes and dusts has from time to time been evaluated by various authorities or groups. Prominent among the latter are the American Conference of Governmental Industrial Hygienists and the American Standards Association. The United States Public Health Service has not attempted to establish any value except a tentative value for lead

*This paper was presented at the Ohio State Safety Conference, September 19, 1949.

laboratory has been increasingly evident. Direct technical service can now be given to the official industrial hygiene agencies in that part of the country much more promptly than was possible when all laboratory and consultation services were centralized in Washington, D. C.

COVER PICTURE

Using a hot tongue of fire from this "factory flame thrower," a Westinghouse lathe operator seals the end of a high-power radio transmitting tube. Photograph by courtesy of Westinghouse Electric Corp.

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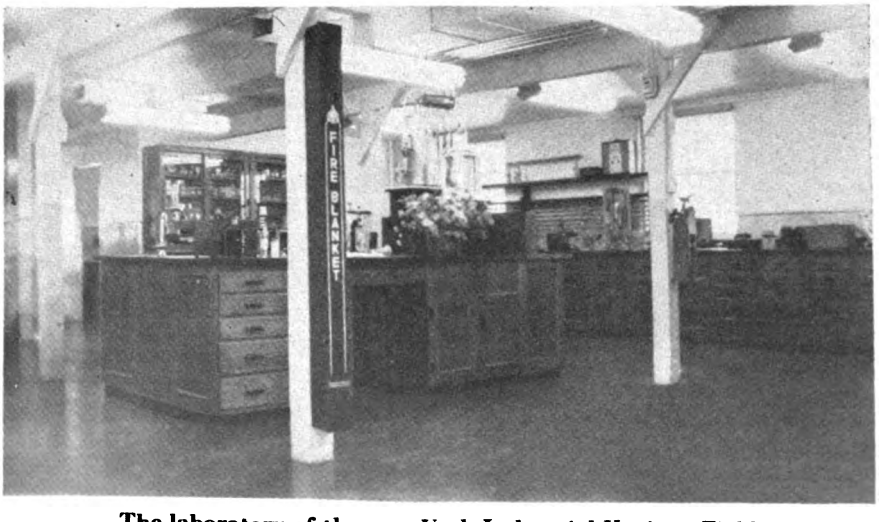


The laboratory of the new Utah Industrial Hygiene Field Station (USPHS) the day of "open house"

dust or fume which was suggested in 1933 and which appears to have been widely adopted.

It is now a generally accepted principle in industry that control of the occupational environment is essential in order to prevent harmful absorption of toxic materials. This concept has grown as a result of repeated poisoning of industrial workers during previous generations. The control of environment is essentially an engineering problem and follows well-established procedures presenting little difficulty in achievement.

The question of extent of exposure to toxic substances, on the other hand, is an extremely difficult problem since base lines must be established for all the toxic materials encountered in industry. Industrial poisoning has followed two patterns in the past—the **acute** type, which is often of the nature of an accident, and the **chronic** type which results from either long-continued contact with small amounts of toxic substances or the accumulative action of certain poisons. A third type of effect, which I shall discuss later, is that of **incipient poisoning** which now demands an increasing amount of attention from industry.

Obviously, and by its very definition, the threshold limit value is a difficult quantity to establish. In the field of industrial hygiene we originally relied to some extent upon the available pharmacological data. Now the pharmacologist is usually only incidentally interested in substances of industrial toxicological importance and is very seldom interested—if we exclude a few gases and substances of a narcotic nature—in the effects of exposure by inhalation. Consequently, a very special field of industrial toxicological investigation has grown up in which, for the most part, animal studies have served as the basis of information.

While toxicological investigations include various procedures, not in any wise related to industrial exposure, these procedures are followed in order to determine what an industrial poison will do under extreme conditions. The more important experimental work is based on inhalation studies. In inhalation experiments the procedure can be so controlled that animals are exposed to different concentrations of an aerial contaminant and the lowest concentration at which this will produce pathological changes can be determined with some exactitude.

One important consideration must be kept in mind with reference to animal experimentation. I refer to the great gap between the concentration which will just affect animals and the amount that man may breathe safely 8 hours daily.

With reference to sensory tests or perception of toxic substances which is engaging some attention at the present time, it should be pointed out that there is a certain fallibility in this type of warning. In the first place, sensory perception of a vile odor may be acute but useless where the substance is not toxic. On the other hand a substance with a vile odor may mask the less pronounced odor of a truly dangerous substance. It is generally well known that many toxic substances perceptible by smell in low concentrations—such as hydrogen sulfide—will quickly paralyze or deaden the olfactory nerve to higher or dangerous concentrations. Again, some dangerous substances in themselves may have no perceptible odor—such as carbon monoxide, or cadmium oxide fume—which may act as a warning agent. Finally, individuals vary considerably in their sense of smell so that what may be annoying to one individual may pass unnoticed by another. Therefore, while it is quite useful in certain cases, sensory perception alone is in general an unreliable index of danger levels.

We have progressed in industrial hygiene to that point where we no longer have the acute mass poisoning nor even the chronic poisonings that we had a generation ago. As previously remarked, acute poisoning of individuals does occasionally occur as the result of accident and doubtless always will. However, the present-day worker is protected against industrial disease as never before.

Now, although he is protected against severe disease, the worker may not be protected against **incipient poisoning.** This is a phase of industrial toxicology that still requires further study. Needless to say, this is a difficult field to explore. The tissue changes which occur, do so over a long period of time and are unpredictable. The time lag in manganese poisoning, phosphorus poisoning, radium poisoning, and silicosis is now well known but until these poisonings were recognized in their later stages as industrial diseases and the damage was done, no hint was conveyed of possible danger ahead.

Many lesser changes may occur in workers exposed to other industrial poisons concerning which we are still ignorant. There are doubtless instances in which continued exposure to minute quantities of poison is not sufficient to produce specific effects and yet this exposure may bring about a general deterioration and diminished power of resistance, as indicated by the prevalence of incidental disease. It is probably true that many mild symptoms such as headache, slight nausea, sleeplessness, chills, sluggishness or the so-called loss of vitality may be traceable to incipient poisoning and this may affect the well-being of workers without being sufficiently severe to call for medical attention. Over a period of years sufficient tissue damage may occur to have some permanent effect on the life of the worker and yet he may go undetected as an industrial casualty. It is important therefore to know, and to know thoroughly, the aerial contaminants—the environment in general—in which the worker is operating.

I have referred to the values which are termed threshold limits or maximum allowable concentrations and would like to clarify further if I can what these values are and how they may be used, for there are certain misconceptions regarding these values and how they may be applied.

Since 1937 the American Conference of Governmental Industrial Hygienists has attempted to seek safe working concentrations for a hundred or so ordinary industrial substances representing various degrees of toxicity. In order to do so the best scientific data and authorities have been consulted. Purposely these values have not been fixed but have been left fluid by annual revision as more and more data have accumulated.

What may appear to be a safe working concentration now may later on be shown to be hazardous. On the other hand, some values may be needlessly low and may impose a burden on management that is wholly unnecessary. Only by gathering facts and figures from industry and by patiently accumulating experimental data can we eventually hope to define a completely safe working environment for industry, and, therefore, when such values are put into a code it is recommended that they be

included in such a way that they can easily be modified.

In view of the fact that the working environment in certain industries or operations may be of considerable importance where these processes involve toxic materials, careful attention should be paid to the matter of sampling for atmospheric contaminants. It is not enough to take just a few samples. A survey of this type should comprise the setting up of a number of sampling stations based not only on the number of workers exposed but also where a few workers may be exposed to unusually high concentrations. The time element or duration of exposure also requires consideration. It is apparent therefore that the evaluation of working conditions, so far as toxic contaminants are concerned, should be based upon most careful and conscientious investigation. This point requires especial emphasis because all too frequently insufficient care has been used in determining environmental working conditions in industry.

In summarizing, I would like to point out (1) that threshold limit values should be used only as guides in an evaluation of the working environment; (2) that appraisal of the working environment, so far as toxic aerial contaminants are concerned, requires especial care; and (3) that present threshold limit values are subject to change and therefore should not be considered as fixed standards.

NEWSLETTERS WANTED

The Division of Industrial Hygiene, USPHS, wants to have five sets of the ***Industrial Hygiene Newsletter*** bound, but copies of several issues are missing in the Division files. If you have extra copies of the following numbers, please mail them to the Division (Washington 25, D. C.): 1947, August; 1948, May; 1949, January.

Other numbers in very short supply are: 1948, January, June, July, August, September, October; 1949, February, April, May, July, August.

Copies of these sent to this office would be very much appreciated.—**Managing Editor.**

Germicidal and Sporicidal Efficacy of Methyl Bromide for *Bacillus anthracis*

By Robert W. Kolb and Roy Schneiter, Ph. D.,
Division of Industrial Hygiene, USPHS

ABSTRACT

The continued increase in industrial anthrax among workers handling imported wool, skins, hides, and hair has demonstrated an urgent need for the development of effective, nondeleterious methods for the disinfection of these products. In studies previously reported, the authors investigated the heat resistance of *Bacillus anthracis* spores in hair and bristles used in the manufacture of lather brushes and recommended a nonpressure steam processing method which was noninjurious to these materials. However, heat-processing methods would obviously be harmful for materials such as wool, skins, and hides. Therefore, it was decided that an exploration of chemical disinfection methods should be undertaken. The studies reported here were limited to an investigation of the germicidal and sporicidal efficacy of gaseous methyl bromide (CH_3Br) against *B. anthracis*.

Six virulent cultures of *B. anthracis*, including strains of canine, bovine, ovine, and human origin were employed in these studies. Sterile filter paper strips inoculated with 100,000–50,000,000 spores/strip; suspensions of spores in physiological saline solution standardized within the same range; and 1–24 hour agar slant cultures from the various representative strains of *B. anthracis* were exposed to gaseous CH_3Br by vacuum-chamber, bubbling and vaporization methods, respectively, for 1, 24, 48, and 72 hours, at room temperature.

Preliminary experiments demonstrated that spores were able to survive in a mixed atmosphere of methyl bromide and air for 3- and 7-hour periods respectively, but were destroyed after exposure for 26 hours.

In 402 tests, with the vacuum-chamber method, gaseous CH_3Br in concentrations of 3.8–3.9 gms./liter completely destroyed anthrax spores in the presence of moisture following 24 hours' exposure. However, in the absence of moisture some spores survived in 27 out of 213 tests regardless of the exposure period.

In 24 bubbling and vaporization tests, both spores in liquid substrate and vegetable cells of *B. anthracis* were killed during exposure to CH_3Br for 24 hours. Liquid CH_3Br per se was ineffective for the destruction of spores from any of the six strains of *B. anthracis* during exposure periods of 1 and 48 hours (30 tests).

Excessively dehydrated spores (i. e., spores dried over $CaCl_2$ at room temperature or at 45° C. for 60–75 days) were found to be no more resistant to the action of gaseous CH_3Br than moist nondesiccated spores.

Since these studies demonstrated that gaseous CH_3Br in the presence of moisture is germicidal and sporicidal for *B. anthracis* after exposures of 24 hours, regardless of the method employed, it was concluded that this destructive action was probably due to hydrobromic acid, a hydrolytic product of this compound. Chemical titration tests for inorganic bromides and pH determinations on control materials exposed to CH_3Br provided further evidence in support of this theory. However, toxicological studies with animals exposed to CH_3Br vapors have given rise to several trends of thought concerning the break-down of CH_3Br and the mechanism of toxic effects produced. The theories that have been propounded are as follows: The alkyl halide molecule itself is directly responsible by penetrating the tissues thus causing toxic responses, that an intracellular hydrolysis of CH_3Br takes place resulting in the formation of HBr and methanol, which act as toxic agents; or that further intracellular break-down products such as formaldehyde, halide ions, or quaternary ammonium compounds might be responsible for toxicity.

Since the specific mechanism of the action of CH_3Br is still controversial, our conclusion that HBr is probably the sporicidal and germicidal agent for *B. anthracis* seems to be plausible. However, additional studies in support of this hypothesis are being carried out by the authors.

Jobside Chats With Charlie

SEE YOUR DENTIST OFTEN

Charlie Craftsman says: "*Don't wait till it hurts.*"

Big Bill was the plant's loud noise and Doc's chief morale wrecker. Whenever Doc got out some health posters and tacked them on the walls, Bill strutted around the plant and scoffed at them.

"Don't be silly," he told the fellows. "If you run to the Doc all the time, you'll get to be like a bunch of scared old women, always looking for trouble, and getting it."

Bill talked like that for years and got away with it. He was as strong as an ox and looked like a perfect specimen of health. Some of the younger men listened to him. But some of us older fellows, who've been around more, knew that some day he'd be sorry.

It all started with a toothache one afternoon. Bill ate an apple during the 3 o'clock break and winced. That was the only time he let on that his tooth was bothering him.

"Better see your dentist," one of the boys advised.

"Nah, it's nothing! I brush my teeth every day. Haven't been to a dentist for years."

"You're just lucky," one of the fellows said. "Brushing your teeth is okay. It cleans out the food and makes your mouth feel good, but it doesn't remove all the bacteria that might cause the cavities. I'll take my dentist's word on that."

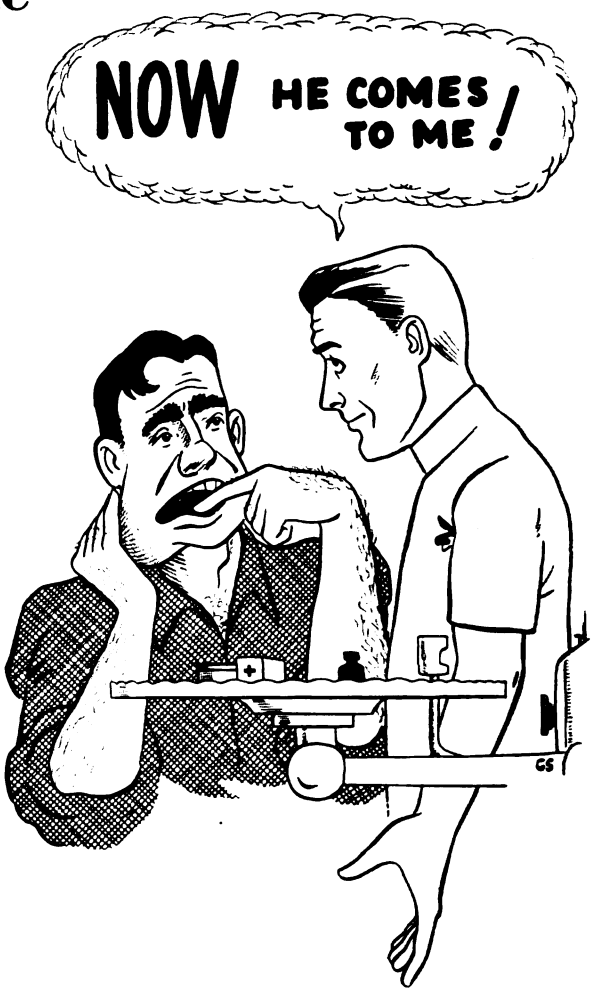
"Aw—you believe everything you hear."

"I'd rather go to the dentist often enough to let him find the cavities *before* they hurt. He fills them, then I don't have to worry about decayed teeth and abscesses."

"Go ahead," were Bill's words. "Support the dentist with your hard-earned dough. Not me!"

Well, 2 weeks later, Bill was really eating crow. He had let the tooth go until the pain almost drove him crazy. Then he found he had to lose a molar. On top of that he stayed out for 2 days—right at a time when the boss was looking for him for a bonus job. So the toothache cost him 2 days' pay, a bonus job, a dentist's bill, and the price of a false tooth.

Course, you can't expect a zebra to change his stripes over night. Bill isn't exactly Doc's little helper, but he doesn't sound off any more about regular check-ups being a lot of foolishness. He probably feels self-conscious every time he sees the dental slogan on the bulletin board which says—"Don't wait till it hurts!"



USPHS PERSONNEL NEWS

Dr. Wilfred David attended the 5-day course on "The Lead Problem in Industry," given in November by the Institute of Industrial Health, University of Cincinnati. The seminar covered analytical and engineering phases of the problem as well as the medical, economic, and legal aspects.

Mr. Peter Valaer, industrial hygienist, is a new staff member with the Division of Industrial Hygiene, PHS. He was formerly employed by the District of Columbia.

TRAINING COURSES TO BE GIVEN IN ATLANTA, GEORGIA

A series of laboratory training courses lasting from 1 to 3 weeks will be given by the Communicable Disease Center at Atlanta, Ga., starting January 9. Some of the subjects to be covered in this year-long program of laboratory diagnosis are rickettsial diseases, intestinal parasites, rabies, mycotic diseases, and tuberculosis.

Questions and applications should be directed to the Chief, Laboratory Division, Communicable Disease Center, 291 Peachtree Street NE., Atlanta, Ga.

Preplacement and Periodic Examinations in Industry Essential For Best Productive Efforts

By Robert B. O'Connor, M. D., Liberty Mutual Insurance Co.

Dr. Robert B. O'Connor, New England director, Division of Industrial Medicine, Loss Prevention Department, Liberty Mutual Insurance Co., has written two articles on physical examinations for the company's publication HEALTH AT WORK. *One is on the subject of the preplacement physical examination program and the other is on periodic examinations in industry. Excerpts follow:*

PREPLACEMENT EXAMINATIONS

The effort directed at proper placement of the applicant is vitiated if no system of control and follow-up is maintained. The supervisor must be advised that the individual is specially assigned to the work and no transfer to other work may be effected without prior clearance through the medical department. There should be no discussion with the supervisor of the pathologic conditions found in the employee since this destroys the confidential nature of the examination, but discussion of the work limitation is permissible so that the supervisor may know wherein his assignment of the employee is limited.

A vitally important part of the preplacement examination is the discussion with the employee of remediable defects where treatment will cure or alleviate conditions found by the examining physician. This element of the examination is often overlooked by the busy physician; yet it can often produce marked improvement in the employees' general health. Where advice as to needed remedial measures has been given, there should be instituted a careful system of followup to determine whether such measures have been taken and, if not, to exhort to action, since human nature is often loath to take active steps to improve general health. Follow-up should also be directed to determining the continued use of protective appliances such as a truss for the employee with a hernia, or safety goggles for the employee who is blind in one eye. A check-up on continuing treatment for hypertension or noncontagious lues and kindred disorders should be made. Failure to advise the employment applicant of remediable defects is a cardinal sin, but failure to follow-up medical recommendations may nullify all the good intentions of such advice.

The employment applicant being examined should be given every consideration normally accorded a private patient. He should first be fully advised as to the purpose of the examination, and often the responsibility for thus orienting the applicant falls to the nurse. At the beginning of the examination or before the physician arrives the nurse takes the opportunity to explain the purpose and value of the examination. The following reasons may be stated:

1. To guarantee the best possible placement to safeguard the employee's health.

2. To detect unrecognized pathologic conditions and advise remedial measures which will improve his health.

3. To minimize the occurrence of accidents.

4. To protect the health of all workers from communicable disease.

He should be advised that the examination and findings are kept in confidence in the medical department, and that they are available to his own physician for guiding treatment when requested. When female applicants are examined, a nurse chaperone should be in attendance.

Even though the examination may have been complete, if it is not completely recorded, careful follow-up is impossible, and its value as medicolegal reference in cases of alleged occupational injury is lost. Incomplete records are of little or no value for comparison with subsequent return-to-work or periodic examinations. The nurse should take and record the history of the applicant and complete as much of the examination as is approved by the physician. This may include height, weight, blood pressure, hearing, visual testing, teeth, tonsils, mouth, urinalysis and drawing, labeling and sending of blood for serologic tests.

After the physician has completed his physical appraisal, the nurse may at his direction discuss remediable defects found and suggested corrective measures or treatment that the physician has advised.

The follow-up on these advices is the duty of the industrial nurse and she should set up a chronological file that will enable her to call to the medical department each employee at the prescribed interval.

Medical rejections are more and more being narrowed to communicable disease, insanity, marked debility, and extensive physical incapacities. Actually almost all of us are physically substandard in some detail. The term "handicapped" is really one of degree. It should be sharply divided into static and dynamic defects when discussing employability. Static defects are those physical impairments which have reached an end point and are not progressive and will not of themselves grow worse. An amputated hand, or a leg withered by poliomyelitis are examples of this type. Persons with these defects are employable. Dynamic defects are those which are progressive and changing. Active tuberculosis or myocardial damage with cardiac decompensation is a dynamic condition. Persons with dynamic defects are not employable.

Extensive employment of those with static defects has proved that their productive output, their absence record, their injury-frequency and severity rates, and their labor turn-over are as good as or better than the corresponding data for unimpaired workers, provided these workers are assigned to work that fits their limitations.

It has been thought by many that companies selling workmen's compensation insurance coverage increase the premium where the physically handicapped are employed. This is not true. Rates are based on experience of the class of industry and modified in most cases by the individual plant experience. There is no indication that losses are increased when the physically handicapped are properly placed. We do not believe that the rejection of the physically handicapped from employment for that reason is either necessary or sound procedure.

To demand that every applicant for employment have the physical qualifications of an athlete is to overlook a valuable portion of the employable population whose worth is increased in the present manpower shortage faced by some industries. Fundamentally only a few physical abilities are needed to do a given job. It is not necessary to have a man who has the all-around appearance and physical qualifications of a football player to perform a job which basically requires only good eyesight plus the use of one good hand.

Management is often loath to embark on a program of preplacement examinations because of the apparent cost entailed. A well-planned and thorough program of this sort is actually a sound investment and will pay ample dividends on its cost. It has been proved that it will control the spread of disease, improve the physical status of the employees, reduce the number of man days lost from injury and illness, reduce compensation cost, decrease labor turn-over, and improve worker efficiency; and hence increase production.

PERIODIC EXAMINATIONS

A well-rounded medical program must include recognition of and a continuing attack upon illness, aging defects, improper placement, occupational diseases, and any other medical conditions that may prevent optimum health in the worker.

Only through continuing health check-ups can continuing assurance of good health, safe placement, and optimum production be obtained. There is no reason to suppose that the worker's physical status during years of employment will remain the same as it was at the time of preplacement examination.

The most intelligent approach is to examine first and most frequently those employees in whom we would most expect to find such changes. In order of importance these are employees exposed to toxic hazards, those with conditions that suggest progressive changes at time of hire, those at middle age, or beyond, and finally the remainder of the plant population, including the executive group and those whose work seriously influences the safety of others.

Those exposed to toxic hazards should be examined particularly for the specific signs and symptoms associated with the toxic substances.

Examinations of exposed personnel should be made even though engineering methods appear to keep the magnitude of exposure below what has been accepted as maximum allowable limits. The reason for this is that in such exposures certain susceptible individuals may develop intoxication when the levels of exposure are below what is known to be safe for most people. Also the safe limit of exposure may be unknown as in beryllium. Periodic examination is of particular importance when the toxic substance has a cumulative effect, that is, small doses are retained in the body and each exposure is added to the preceding exposures to accumulate enough of the substance to attain toxic levels.

The frequency of examination must depend on the toxic substance and the exposure concentration, and no rule of thumb can be set down that will cover all circumstances.

It is agreed that reliance on periodic examinations can never be used to supplant good engineering methods for control of the hazards.

Periodic examination and follow-up of persons with defects found in the preplacement physical examination should be considered an essential part of the industrial health program to exhort to treatment when necessary, to check on the progress of the conditions, to assure continued safe job placement, and to note the continuing use of protective devices.

Again the frequency of such examination must be determined by the nature and severity of the condition found. Most pathologic conditions, except for static defects, require follow-up, monthly at first, and later, when the course and progress are certain, the intervals between examinations may be lengthened.

Those employees who have reached middle age or beyond are becoming an increasingly important medical problem in our national economy.

In many geriatric problems, notably those involving arteriosclerosis and osteoarthritis, the major attack lies in keeping the individual's activity safely within his physical reserve. This does not mean simply telling the worker that he is not as young as he used to be. It means a serious effort to explain so that he will understand and accept the significance and extent of the limitations that age has placed on his physical capacity. Of course, job adjustments may be necessary as aging processes progress, and these may be anticipated by keeping in touch with the individual's condition. Employees over 45 should be examined at least once a year. Over age 60 it would be well to have a health check-up every 6 months.

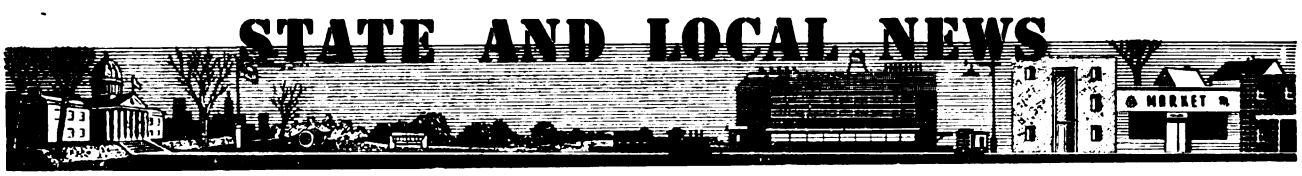
Most workers of advancing years are in a trade or occupation that has constituted their life work. If a job adjustment appears advisable due consideration should be given to the emotional needs of the worker. Taking him out of that trade may mean to him an end to a happy, satisfying life. No flip recommendations on inadequate medical evidence should ever be made to effect such a serious change in a worker's life. Moreover when job adjustment appears necessary every effort should be made to continue in some form the use of his long-developed skill and experience.

The annual examination of executive or "key" personnel is also receiving wider acceptance by industry.

There will probably be uncovered some conditions that will lead to compensation claims. It is important to understand and accept this because an unexpected compensation claim has in some instances caused abandonment of the whole program. It is much more intelligent to uncover an occupational hernia, accept it, and pay for its correction, than be ignorant of its existence and permit continued heavy work to result in serious hernia strangulation later.

Physical conditions will be uncovered that will require job adjustments. No program of periodic examinations should be undertaken until the probable need for job adjustment is accepted by management and labor, and a procedure is set up for accomplishing such work changes. This procedure should include consideration of possible attendant wage scale changes.

Regarding the other types of examinations listed, opinions differ as to whether the check-up should be left to the employee's discretion. Ideally it should be obligatory but with full employee and union support. Otherwise, those who need it most may be missed.



ARKANSAS

Cooperation.—The Division of Industrial Hygiene has continued to develop the policy of working through county and district health personnel to the fullest extent possible. It has been found particularly advantageous to have local sanitarians follow up on recommendations. Encouragement of their participation results in information on new plants and processes being passed on to the central office without delay.

INDIANA

Monument shops.—A survey of 120 monument shops has been completed, having been undertaken to determine to what extent workers in the cemetery memorial industry might be exposed to silica-bearing dust. Specific recommendations were made to each shop on dust-control measures and medical services for the workers.

KANSAS

Personnel.—Mr. William S. Johnson, industrial hygienist, attended the 3-week United States Navy Radiological Safety School, Treasure Island, Calif., for his annual active duty assignment as a member of the Naval Reserve.

Dr. Frank E. Hoecker, former senior physicist and later consultant to the Division of Industrial Hygiene, USPHS, is now an associate professor of physics at the University of Kansas in charge of a research project for the United States Navy. He has assisted the Kansas State Board of Health on radiological problems within the last few months.

LOS ANGELES (City), CALIF.

Physical examinations.—One of the largest banking firms in this area has asked for advice and assistance in establishing a program of periodic physical examination for its 2,500 top supervisory personnel. This Division is now gathering comparative data from eastern sources and will encourage the extension of this worth-while project to all employees of the banking firm.

Chemicals in transportation.—For some time consultations have been held with the engineering personnel of a large petroleum company regarding the proposed transportation of a highly toxic and flammable chemical in tank trucks through city of Los Angeles territory. The dual hazards brought both the fire department and health department into the picture since their responsibilities are defined in Ordinance No. 91,616.

To overcome the fire and explosion hazards, it was decided to absorb the toxic gas in an aqueous solution and transport it in this form. Now it is our responsibility to ascertain that the toxic solution will be transported in such a way as to present no health hazard to the community.

Our first conferences resulted in incorporating a maximum of structural strength features into the design of the conveying vehicle. Then, at our request, the oil company made a series of experimental spill tests, to learn the possible rate of travel of the toxic gas as it left the spilled pool and the resulting concentrations at various distances from the focus of spill.

On the basis of these tests a series of safety precautions will be drawn up for the protection of the truck drivers and the public en route, to be strictly followed in the event of a serious accident which would allow the toxic liquid to escape.

Nursing.—Having heard of this Division's survey of health services for hospital employees in this area, the supervisor of employee facilities in an Oakland hospital met with our nurse consultant for advice on improvements in her program.

A most important development in this field is the recent inauguration of part-time nursing services for smaller plants where a full-time nurse is not warranted. Organizing this activity is an industrial nurse with excellent experience in this area, who knows the importance of health education for the industrial worker and the utilization of community health and welfare services.

Two plant industrial nurses and the office nurse of a leading industrial physician accompanied our nurse consultant on a visit to industrial plants with the ideal type of medical department. In both plants the nurses emphasized the importance of public health in their medical programs. This experience has impressed the visitors with the need for balancing their own medical provisions to incorporate health education and public health principles.

MASSACHUSETTS

Conference.—An all-day meeting of the New England Section, American Industrial Hygiene Association, was held on October 28 at the Hotel Kenmore, Boston. John B. Skinner, director of Occupational Hygiene in Massachusetts, and E. Ward Thompson, of the American Mutual Insurance Co., were cochairmen.

Other members of the staff who contributed papers included: Dr. Hervey B. Elkins on "Composition of Nitrous Fumes;" Dr. Clarence C. Maloof on "The Role of Porphyrins in the Prevention and Diagnosis of Lead Poisoning;" Harold Bavley on "Some Environmental Aspects of Tunnel Construction;" and Benjamin P. W. Ruotolo on "Environmental Aspects of a Case of Poisoning From Cadmium-Bearing Solder."

Personnel.—Dr. Lamson Blaney, plant physician for Monsanto Chemical Co., Plastics Division, Indian Orchard, spent 2 weeks with the staff of the Massachusetts Division of Occupational Hygiene, to study methods of industrial hygiene practice in the field and laboratory.

X-ray.—Because of the recent publicity via the radio concerning the dangers of X-ray shoe-fitting machines, particularly to children, the Massachussets Division of Occupational Hygiene is anticipating many calls for services in checking these machines against unnecessary exposure to the harmful X-radiation.

OREGON

OD Code.—The State Industrial Accident Commission promulgated and adopted a revised safety code relating to the prevention and control of occupational disease, effective September 1, 1949.

The new code lists the maximum concentrations of 156 gases, vapors, fumes, dusts, mists, and radiations which will be permitted in Oregon workplaces. The old list contained 61.

PENNSYLVANIA

Exhibit.—A display booth was constructed for use by the Bureau of Industrial Hygiene and used at the American Public Health Association meeting in New York and the Pennsylvania Public Health Association meeting in Harrisburg.

It depicts the Bureau's new apparatus for atmospheric sampling powered by means of an automobile windshield wiper. A silhouette of a factory building forms the background of the exhibit and on another silhouette of the front view of an automobile, in the foreground, an actual windshield wiper is in operation. Various collecting apparatus and orifice flowmeters, all operating as in the field, are a feature of the arrangement. The booth is decorated in the State colors.

ST. LOUIS, MO.

Air pollution.—The Industrial Hygiene Section has an additional function of enforcing ordinance provisions governing fumigations and during this reporting period has been officially charged with a new responsibility—that of developing an investigative, educational, and enforcement program for the control of certain types of air pollution.

This program is to be carried out under the provisions of the Air Pollution Control Ordinance adopted in April 1948 by the Board of Aldermen of the city of St. Louis. The Smoke Regulation Division of the Department of Public Safety has the responsibility for the control of air pollution resulting from the burning of fuel or refuse.

The type of air pollution which is particularly the problem of the Industrial Hygiene Section is that from sources other than the burning of fuel or refuse. The Health Division has, in the past, conducted considerable educational work in air pollution control of this type, even before the passage of this ordinance. However, the ordinance does place responsibility and gives ordinance support for enforcement activities.

Small plant medical service.—In collaboration with the industrial hygiene nursing consultant, many visits were made to employers of small plants in an attempt to stimulate the inauguration of "part-time" nursing and medical services.

WISCONSIN

Lecture course.—The West Allis Industrial Safety Council, sponsoring safety training courses for the seventh consecutive year, has added an industrial hygiene course to its program. Six 2-hour sessions held at the West Allis Vocational School were given by Mr. Walter F. Scholtz, supervisor of industrial hygiene at the Allis-Chalmers Manufacturing Co., Milwaukee.

This course was designed to provide background information for people who, through their work activities, are confronted with industrial hygiene problems. The sessions included scope of industrial hygiene engineering, airborne dust and fume hazards, air-borne solvents, gases and vapor hazards, industrial ventilation, occupational dermatitis, and disinfectants and pest control.

DR. C. O. SAPPINGTON DIES IN CHICAGO

Dr. Clarence Olds Sappington, well known for his work in industrial hygiene, died in Chicago November 6 at the age of 60. He had been suffering from a heart ailment. Dr. Sappington was editor of "Industrial Medicine and Surgery of Trauma," as well as author of several books.

ANILINE DYE CAUSES DEATH OF 4 INFANTS

Aniline poisoning caused the death of four infants last June in a Lake Wales, Fla., hospital, according to an Associated Press dispatch.

The babies' diapers had been marked with a new shipment of aniline dye. The diapers had been sterilized after marking, but had not been laundered before use. Symptoms of aniline poisoning developed within 5 hours after newly marked diapers were put to use and within a few days all four infants died because of the absorption of aniline through the skin.

This story carries one lesson worthy of attention by industrial hygienists. Because so much of our work is concerned with air-borne contaminants we tend to concentrate on the prevention of poisoning by way of inhalation. We are prone to relegate the possibility of skin absorption to the background and to minimize its importance. Fatal accidents like the above dramatically illustrate the hazards of percutaneous absorption, not only with regard to well-known skin penetrants such as aniline, but also in connection with new materials such as parathion and other organic insecticides.—**Industrial Hygiene Division, Florida State Board of Health.**

OREGON NURSES MEET

One of the highlights of the forty-first annual convention of the Oregon State Nurses Association was the luncheon meeting sponsored by the industrial nurses. Mrs. Linnie Laird, secretary of the American Nursing Association, and one of five official delegates, who attended the International Council of Nursing, was toastmistress. Mrs. Margaret Barclay, chairman of the industrial section of the association, presided at the meeting.

Topics of interest to the industrial group during the general sessions of the convention were "Basic Principles of Economic Security" discussed by Dr. Elizabeth Porter, from the American Nurses Association; a panel discussion on "Health Insurance"; and a dramatization of the structure study. Resolutions were passed favoring the two organizational plans.

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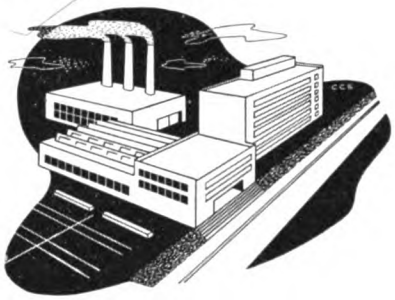

PHS DENTISTS PARTICIPATE IN DETROIT CLINIC

Dr. F. J. Walters and Dr. Vernon J. Forney of the Public Health Service conducted a clinic in Detroit recently under the auspices of the Detroit District Dental Society at its Eighth Annual Dental Review.

Dr. Walters, of the Division of Industrial Hygiene, spoke on the "Oral Diagnosis of Occupational Diseases." He described the interrelated activities of engineers, nurses, dentists, physicians, and toxicologists in the field of industrial hygiene. The industrial dentist, he stated, should have a knowledge of the materials known to affect the oral structures when present in the atmosphere of the working environment in sufficiently high concentrations. He pointed out that the mucosa, teeth and periodontal tissues, tongue, gingivae, and lips were the oral structures which are most susceptible to occupational influences.

With the aid of lantern slides, Dr. Walters presented a broad classification of occupational exposures reported to have caused structural and functional changes in and about the oral cavity. They were classified according to categories of exposures affecting the oral cavity, such as physical factors, radiation hazards, dusts, gases, metals, bacteria, alkalies, acids, inorganic substances, and organic compounds. An outline of the major oral manifestations of each of the categories was presented.

Dr. Walters concluded his talk with an exhibit of a series of color slides depicting clinical findings of oral pathology which were of an occupational origin.

Dr. Vernon J. Forney, of the Division of Dental Resources, USPHS, presented a short discussion relative to the application of public health methods to a specific population, namely, the industrial population.

He suggested that study groups from the dental societies be formed for the purpose of working with industrial hygiene and dental health personnel of the local and State health departments in an effort to learn of methods which could be applied to improve the oral health of the industrial population.

Attention was called to the fact that the industrial population of our Nation forms a huge dental need potential. He also suggested that this group of the population is not fully aware of their own dental needs and, consequently, have not fully availed themselves of the benefits of regular dental treatment.