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Eye and Throat Irritation Due to Formaldehyde

Unusual complaints of eye and throat irritation in two mercantile shops were recently investigated by the staff of the Massachusetts Division of Occupational Hygiene. In one shop, curtains and curtain material were handled; in the other, shoe fabrics and linings.

In both establishments, the symptoms reported by the workers suggested the presence of an aldehyde, such as formaldehyde, and in the second shop the odor of this gas could be detected. The source of the gas was apparently the stock kept on hand in the store. In the first shop, several samples of curtain fabric, when extracted with water, gave tests for aldehyde varying from weak to strong. The sample containing the most formaldehyde, when stored in a bottle overnight, gave off enough formaldehyde to give a strong test.

In the second shop, several samples of loosely woven fabrics suspected of having been stiffened with a formaldehyde condensation-type resin were obtained for chemical analysis in the Division's laboratory. All tests gave positive readings for free formaldehyde, some higher than others. Hence, it was concluded that the eye irritation which had alarmed the workers in the incriminated area was due to formaldehyde escaping from the resin contained in the finished shoe linings being stored.

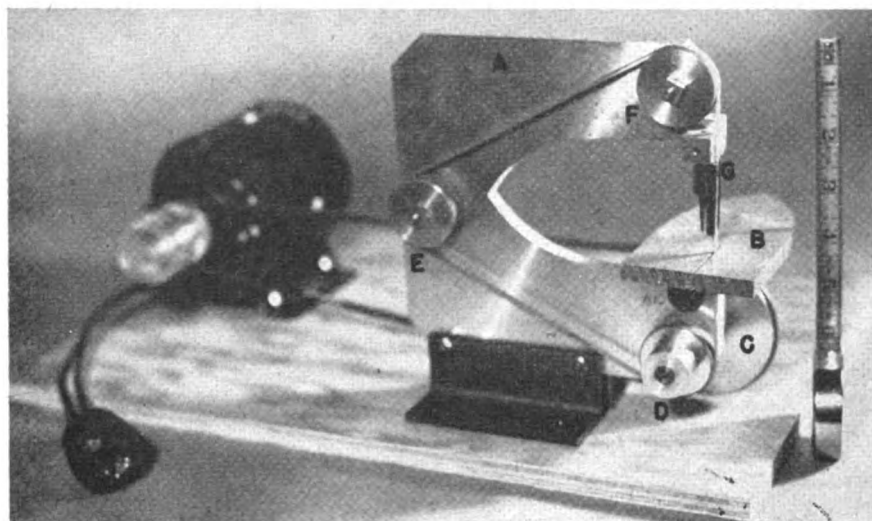
The Massachusetts maximum allowable concentration for this hazardous agent is five parts per million. Since it was certain that concentrations in the basement were considerably less than this amount, and since the workers were in the area only occasionally, it was concluded that the severity of the exposure was not hazardous, but somewhat disagreeable.

A recommendation for ventilation called for the installation of a 12- or 14-inch exhaust fan to be located in the window at the front of the room facing the sidewalk.



HOW TO BUILD A MIDGET BELT SANDER

By Oscar Marsh



A MIDGET belt sander has been constructed with which small thin cuts may be made much more accurately, smoothly and rapidly than by hand methods. It was built specifically to facilitate finishing the spiral portion of the spiral sampler described by Yaffe, and others (1). Use of this sander has made it possible to produce a considerable number of spiral samplers in a short time. Furthermore, greater uniformity of air flow characteristics is obtainable, as demonstrated when air flow versus resistance calibrations are made.

Since this tool may be useful for many other jobs where precision cutting is necessary in complex or confined situation, its construction details are presented.

The complete belt sander is shown in Figure 1. It was constructed in our shop from stock aluminum, a few scraps of angle iron, and a spare electric motor. The driving and idling wheels were turned down on a lathe, a band saw was used to cut the aluminum, and a drill press and grinding wheel were used in finishing operations. The job could be accomplished with lathe, hack-saw, hand drill and grinding wheel.

Mr. Marsh is a machinist with the Division of Occupational Health, U. S. Public Health Service, Cincinnati, Ohio.

The following construction details are given for those who wish to build this useful shop tool: Referring to the figure, C-frame, A, was made from a $\frac{3}{8}$ -inch aluminum plate approximately 7-inches square. U-shaped section, approximately $2\frac{3}{4}$ by $4\frac{1}{2}$ inches, was cut from the C-frame and this section was used for table B. The table was mounted on the C-frame by means of a short section of angle iron in such a manner that it was perpendicular to the vertical axis of the belt.

The driving pulley C was cut from 3-inch bar stock and grooved to accommodate a $\frac{3}{16}$ -inch round belt. Driving wheel D was turned down from bar stock to $1\frac{1}{2}$ inches diameter and a $\frac{3}{8}$ -inch face slightly crowned, with an inch diameter short hub. Pulley C and wheel D were mounted on the same shaft. Idling wheels, E and F, were turned down to a $1\frac{1}{2}$ -inch diameter and a $\frac{3}{8}$ -inch face also slightly crowned.

Wheel F was mounted on the C-frame in a vertical line with wheel D approximately 6 inches on centers. Wheel E was mounted on the C-frame on an eccentric camshaft approximately $6\frac{1}{2}$ inches from the centers of wheels, D and F, to provide for tension on the belt.

A $\frac{3}{16}$ -inch strip was taken from a 24-inch length of abrasive cloth to form the sanding belt. The ends were lap spliced with rubber cement. The faces

of wheels D, E and F were covered with rubber cut from a length of $1\frac{1}{2}$ -inch Gooch crucible rubber tubing.

The belt guide and pressure plate G was made from a piece of $\frac{1}{2}$ -inch diameter steel drill rod cut to $2\frac{3}{8}$ inches long. One side (front) was grooved to provide a recess $\frac{3}{16}$ -inch wide and $\frac{1}{16}$ -inch deep to serve as a guide for the sanding belt.

The lower $\frac{3}{8}$ -inch of the drill rod was cut away to form a very thin tongue which extends to the top of the slit in table B. The tongue serves as a support for the sanding belt. The combined thickness of tongue and belt splice should be about 0.040 inch or less for very fine or thin cuts.

The belt guide and pressure plate were mounted on the C-frame with a small block of aluminum about $\frac{1}{2} \times \frac{1}{2} \times 1$ inch so as to bring the bottom of the groove flush with the back of the belt. A $\frac{1}{20}$ -hp electric motor with a $1\frac{1}{2}$ -inch diameter pulley provided sufficient power.

Most of the dimensions stated above are not critical and a size to suit individual needs could be constructed. However, for sanding very narrow slots, the combined thickness of belt splice and tongue is critical.

Reference

(1) Yaffe, C. D. Hosey, A. D., and Chambers, J. T.: The spiral sampler—a new tool for studying particulate matter. *A. M. A. Arch. Ind. Hyg. & Occup. Med.*, 5: 62-70 (January) 1952.

QUESTIONS AND ANSWERS

Will fumes from allyl alcohol injure the eye?

ALLYL alcohol is a water-white liquid of low boiling point which is soluble in water, alcohol and ether. It volatilizes readily and gives off pungent vapors which irritate the mucous membranes and the skin. We have no information whether or not allyl alcohol would do permanent injury to the eye itself. However, prolonged exposure to the irritant fumes will cause irritation of the eyelids and adjacent membranes. The fumes of allyl alcohol are much more irritating and toxic than

(Continued on page 181)

GEORGIA'S VOLUNTARY MULTIPLE HEALTH TESTS—

*A Sixth Year Progress Report*¹

By Lester M. Petrie and Richard H. Fetz²

SINCE THE INCEPTION of the voluntary multiple health test program in Georgia, in 1945, with its then combined tests for tuberculosis and syphilis, the testing procedure has been gradually expanded. Today, we offer as a free service to any volunteer over 12 years of age blood tests for diabetes, anemia, and syphilis, and a chest X-ray, which is read for cardiovascular conditions, malignancies, and other pathological conditions of the chest as well as tuberculosis.

The foundation stone on which this whole program is built is the close cooperation and harmony that exists among our various Georgia health departments, city, county, and State, and the medical profession in Georgia. This is something of which we are especially proud. We are proud that an overwhelming vote of confidence has been given our program by physicians and laymen alike, including economic and social groups.

We are often asked how we justify such a program or why we offer voluntary multiple health tests in the first place. The answers to these questions are not simple.

Each of us here is aware that there is a rapidly increasing number of individuals in our older age groups, due in part to better medical care. Yet, as a result of this increased life span we are witnessing the development of an ever increasing number of cases of chronic disease.

The early discovery of chronic diseases cuts medical bills and patient hospital time. In the voluntary multiple health testing program, the subject being tested reports to one center for all tests. The tests which act as aids in diagnosis are done by nonmedical personnel under medical supervision. All of these facts naturally result in direct savings to the individual concerned and to the community taxpayer

who must help support the patient if he becomes indigent.

Average cost per person tested is about one dollar, including all tests currently being made. Furthermore, early discovery of chronic diseases while the patient is self-supporting permits him to pay for medical care out of earned income. This removes much of the burden of charity medicine from the medical profession. Likewise, voluntary multiple health tests appear to be the most effective method yet demonstrated of teaching the entire population the advantages and benefits of routinely consulting the physicians of their choice.

These arguments are just a few of the many that support the concept of voluntary multiple health testing. Needless to say, there are individuals who have a rebuttal for each argument supporting this type of health program, but we believe that, when both sides of the ledger are added up and balanced, the arguments in favor of voluntary multiple health testing far outweigh their objections.

In 1951, the Georgia Department of Public Health maintained two separate survey organizations or units. The units as a group were able to test approximately 182,000 people last year.

Tuberculosis Case Finding

The initial or screening chest X-rays are made with 70-millimeter photofluorographic units. If the initial or screening film is unsatisfactory or shows evidence of tuberculosis or other chest disease, the individual is recalled to a diagnostic center. Further tests are then made, including a tuberculin skin test, sputum examination, and an X-ray on a 14- x 17-inch plate, when indicated.

Of 181,579 individuals tested in 1951, 0.47 percent or 856 individuals were diagnosed as tuberculous. An activity breakdown of 738 of the cases showed that 140 were classified as active cases, 400 questionably active, and 198 were grouped as inactive. One interesting fact brought to light is that our case-finding program revealed that about 72

percent or 615 individuals did not have any previous knowledge of this tuberculous condition.

Cardiovascular Conditions

Each physician who reads the initial 70-millimeter X-ray films is requested to be extremely alert for films showing possible cardiovascular abnormalities, and all films in which such a condition is noted are referred to special cardiac consultants for further study. In this phase of the program about 1,100 individuals were referred to their private physicians for more complete examinations.

Other Conditions

The initial X-ray films are also studied for pathological conditions of the chest other than tuberculosis or cardiovascular conditions, and as a result of such findings, about 1,400 individuals were referred to their private physicians. A number of cases were diagnosed as pneumoconiosis. The Industrial Hygiene Division follows up these cases with surveys of the working environment wherever possible.

Serologic Test for Syphilis

All blood specimens are screened for syphilis by means of the VDRL rapid slide flocculation tests. Positive or weakly positive sera are quantitated by means of the Kahn test. Those individuals with a positive or weakly positive reaction are requested to report to a central diagnostic center for further examination.

From July 1, 1950, through December 31, 1951, 244,493 were voluntarily tested. Out of 244,493 specimens submitted, 24,109 or 9.8 percent were reactors. Of these, 6,965 represented new or previously untreated cases of syphilis and 5,555 were known cases returned to treatment. Thus a total of 12,520 cases of syphilis was referred for treatment. Of these, 681 were diagnosed as primary or secondary syphilis; 48 as cardiovascular; 254 as neurosyphilis; and 1,128 as congenital.

Trained and experienced communicable disease investigators interview all

¹ Presented at the 1952 Industrial Health Conference.

² Dr. Petrie is director and Mr. Fetz is an industrial hygienist of the Division of Occupational Health, Georgia Department of Public Health.

cases and investigate all contacts. Contact investigation, which must be an integral part of any effective venereal disease case-finding program, was responsible for the discovery of a majority of the 681 cases of primary or secondary syphilis.

Anemia Case Finding

The copper sulfate specific gravity method of Phillips, and others (1), was used for determining the hemoglobin concentration. For this examination, a screening level of 10.5 grams percent was used. All of those individuals falling below this level were referred to their private physician for further study and treatment where indicated. Of the total of 118,436 individuals tested from April to December of last year, 5.8 percent or 6,883 were found to be abnormal. As expected, the greatest incidence of anemia was in the Negro female.

Diabetes Case Finding

The diabetes testing program in our State has been the subject of several reports in the last 2 years (2, 3). The method that is used for an evaluation of the blood sugar level involves the use of the Anthrone reagent, and the technique was perfected by the laboratories of the Georgia Department of Public Health. The screening levels that are used for diabetes screening tests are rather involved. All persons who are found in the primary screening tests to be suspicious are requested to report to the testing center for follow-up tests. These confirmatory tests include a simple glucose tolerance test accompanied by urinalysis.

In early 1951 the screening levels for this diabetes test were lowered, and as a result our statistics on the first 60,000 individuals tested that year cannot for study purposes be combined with the data on the 120,000 individuals tested during the rest of the year. For the first time, our testing program has been able to establish the fact that in Georgia the rate for diabetes between the ages of 20 and 59 is higher in the Negro female than in any other group. This difference in racial groups is not thoroughly understood at this time.

Our statistics based on approximately 120,000 individuals reveal the fact that the over-all rate for abnormal carbohydrate metabolism is 1.84 percent.

Discussion

The advisability of multiple health testing surveys is still considered to be highly debatable in many quarters. However, our experiences during the past year have strengthened our convictions that such a program is both economically and medically sound. This conviction is based upon experience with over a million persons voluntarily tested. I would like to quote some of the opinions expressed on that subject in our paper which will appear at an early date in the *Journal of the American Medical Association*. The quotations follow:

"The surveys, however, are perhaps only a passing phase, leading on to the eventual offering of some such tests by the local health departments as a routine service to all citizens on a periodic basis, perhaps, annually or in special cases more frequently if indicated, or by special request from a physician.

"Smillie (4) has suggested that the diagnostic facilities now used in mass health testing should be developed as a source to which the physician with his comprehensive knowledge of the whole person could refer his patient, but should not be available to the general public except through such referral. We agree this proposal would be the best, if by it each of the 155,000,000 citizens of our country could obtain a physical examination. However, it is also estimated by Smillie, 'that 900 out of 1,000 persons tested under multiphasic screening programs are not under medical supervision.'

"This is apparently supported by our findings that 81.5 percent of the tuberculosis cases found in the Atlanta survey were previously unknown as tuberculosis suspects. Our screen tests swamp the physicians with more applicants from this previously unsupervised group than the physicians can handle with ease. Many of these applicants are potential patients whose screen tests indicate suspicion of disease.

"If the medical profession is going to advocate annual examinations where needed, it undoubtedly could not do better than to join hands with the public health profession in scientific case-finding as has been done in Georgia. The primary responsibility for this type of preventive service rests upon the practicing physicians in cooperation with

the health departments. Neither can do a good job without the other."

Summary

This report now brings up to date information obtained from voluntary multiple health tests which have been performed on more than 1 million persons in Georgia during the past 6½ years. All evidence points to the fact that, at least in Georgia, with the specific tests enumerated here, multiphasic health tests surveys of more than half the entire adult population of the State can be done in a manner mutually profitable and acceptable to all. Both patient and doctor profit from early case-finding while the patient is still capable of self-support and is not a burden upon his family or the State.

The possibility of successful surveys may still be debated, but in Georgia they are an accomplished fact. Such success would never have been possible in Georgia had there not been the background of many, many years of understanding and harmony between the practicing physicians and their professional brothers in the field of public health. In this same spirit of harmony, our medical and public health professions propose to continue working together toward solutions of our many common and pressing problems. There is no doubt that the multiphasic screening surveys are giving all, professional and lay people alike, more insight than ever before into the extent of these problems.

References

- (1) Phillips, R. A., Van Slyke, D. D., Hamilton, P. B., Dole, V. P., Emerson, K. Jr., and Archibald, R. M.: Measurement of Specific Gravities of Whole Blood and Plasma by Standard Copper Sulfate Solutions. *Journal of Biological Chemistry*, Vol. 183, No. 1, (March) 1950.
- (2) Petrie, L. M. and Fetz, R. H.: Diabetes Case Finding in Georgia. *Journal of the Medical Association of Georgia*, (March) 1951.
- (3) McLoughlin, C. J., Petrie, L. M., and Fetz, R. H.: Diabetes Detection in Georgia. *Journal of the Medical Association of Georgia*, (July) 1951.
- (4) Smillie, Wilson G.: Multiphasic Screen Tests, *Journal of the American Medical Association*, Vol. 45, p. 1256, (1951).

A Medical Program Versus a First-Aid Station¹

By Dr. Glenn S. Everts²

INDUSTRY is gradually recognizing the economic sense of taking just as good care of its employees as it does of its machines. Not only accidents, for which the employer is lawfully liable, but sickness which is not covered by law should also be the responsibility of the employer. Why?

Why shouldn't the employee, especially the executive, be expected to assume the responsibility of taking care of his own health and paying for it out of his own pocket? The answer is—he should—but he doesn't. The absenteeism rate proves it. The too early deaths of executives proves it. So industry actually and literally pays for that neglect.

Whether or not industry believes it should carry the burden of its working family's health, in the long run it is the cheaper way. Now, to get right down to costs.

An estimate from the figures of a survey made by the National Association of Manufacturers in 1940 covering 2,064 industrial establishments, shows that the average expenditure for the plant medical service was \$12 per employee per year. I believe it would be quite conservative to say that today that figure of \$12 has risen to \$15.

The unit cost of a medical service, as with other commodities, is more for a smaller amount and less for a larger amount. I know of a plant whose management as long ago as 1936 was spending \$21 per employee per year for an employed group of only 200 people.

However, this was well above the average in medical costs for plants of that size. I also know of a plant which employs over 6,000 people whose management spends for its health service nearly \$15 per employee per year, the going figure we have estimated for plants of between 1,000 and 2,000 employees.

Assuming that you want some concrete reasons why a plant should have a medical service, I shall tell you why several Philadelphia plants started their health services. Here are their reasons:

(1) Very poor accident record—insurance company is urging better care of accidents.

(2) Forthright realization that one, or two or more, quite serious and costly accidents could at least have been minimized if competent early in-plant care had been available.

(3) Realization of a poor absenteeism record.

(4) Competitor plants have a medical service.

(5) Firm belief in personal health care and awareness of good health among employees.

(6) Early untimely death of two or more key people or executives.

(7) Last, and more recently and increasingly significant—the definite trend of unions to write a health coverage clause in their contracts which may attempt to dictate the amount and kind of medical care if something not quite satisfactory to them is not already in existence.

It is possible that you may have a similar situation which could be used to motivate your management toward a medical service.

Philadelphia plants, when they want to start a medical department, may call for the help of the Industrial Health Section of the Philadelphia Safety Council of the Chamber of Commerce and Board of Trade. One of the major efforts of that committee has been to bring to any group whatever information is available about medical services in industry and to apply it to a specific plant.

Three or four of us, industrial physicians and executives, will leave our own work and by request go to the office of any executive to tell him all we know about the details of a small or large medical service, and why, in our experience, we feel sure that it pays to have one. Several small and well set-up medical services have come into being

over the past few years as a result of this help.

For the Philadelphia plant which cannot afford a clinical laboratory, community organizations make available services such as these: (1) A chest X-ray survey by the Philadelphia Tuberculosis and Health Association, (2) a blood test for syphilis by the Division of Venereal Disease Control of the city's health department, (3) a dental survey by the dental survey laboratory under the Division of Industrial Hygiene of the Department of Health of Pennsylvania, and (4) a survey by the Philadelphia Committee for the Prevention of Blindness for that very serious and insidious eye disease which if not discovered early is almost certain to cause blindness—the disease known as glaucoma. Before long several other health procedures may be added to these in our larger communities. These procedures are being much talked about under the subject of multiphasic screening. But the above four surveys can be taken advantage of now.

Some industries are working toward better health with a broad vision—not only to do what it takes to keep people from being just barely short of sick, but also to take time to teach them individually how to live so that they may reach a state of physical and mental fitness which makes life thoroughly enjoyable.

Different industries are approaching this goal in different ways, but it is my own feeling that a rather thorough individual health examination program is the keystone of that goal. Here is an example of what the Curtis Publishing Co. is doing.

On a voluntary basis any employee may sign a request for his health maintenance examination. He is called by appointment to the laboratory for the following tests: (1) urinalysis, (2) a complete blood count and blood typing, (3) a blood test for syphilis, (4) a chest X-ray, and (5), if over 40, an electrocardiogram. A few other tests, such as the determination of a basal metabolism rate, may be included later.

Before the employee leaves the laboratory, an appointment is made for him to return to see the doctor about 10 days later. The doctor is allowed 1½ hours per employee, which includes the dictating of a summarizing letter to the

(Continued on page 179)

¹ Presented at Industrial Relations Association of Philadelphia, November 27, 1951, and summarized here. The speech was printed in full in the March 1952 issue of *Industrial Medicine and Surgery*.

² Dr. Everts is medical director of the Curtis Publishing Co., Philadelphia, Pa.

GOVERNMENT PERIODICALS AVAILABLE TO YOU

The government periodicals listed here were selected as those of most interest to the readers of **OCCUPATIONAL HEALTH**. If you are not familiar with them and wish to see sample copies, address the editors at their respective agencies.

AGRICULTURAL ECONOMICS RESEARCH—Bureau of Agricultural Economics, U. S. Department of Agriculture. Quarterly. 32 pp. 75 cents a year domestic, \$1 foreign.

A technical journal for agricultural economists and statisticians. It publishes signed articles and reviews of literature in agricultural economics. Three types of subject matter are covered (1) results or findings of BAE research, (2) new research methods or techniques, and (3) new or expanding areas of research or statistical fact gathering.

EMPLOYMENT SECURITY REVIEW—Bureau of Employment Security, U. S. Department of Labor. Monthly. 36 pp. average. \$2 a year.

For (1) exchange of experiences and problems among local offices of the State employment security agencies; and (2) for discussion of procedures, policies, and practices involved in the administration of employment security programs including employment service and unemployment insurance.

FIELD REPORTER—Division of Publications, Department of State. Bimonthly. 40 pp. \$1.50 a year.

Provides information on developments in educational, cultural, scientific, technical and other phases of international cooperation as an arm of United States foreign policy. Mainly reports from the field and news notes on U. S. programs, both public and private, carried on in all areas of the world.

FOREIGN COMMERCE WEEKLY—U. S. Department of Commerce. Weekly. 30 pp. average. \$9 a year domestic, \$12 a year foreign.

Reports opportunities to sell products abroad; sources of foreign raw materials and merchandise for import to U. S.; lists of businessmen from abroad visiting the U. S.; business and industrial developments abroad; world economic conditions; exchange and finance, tariff, changes, and other regulations; world-wide commodity information on production, consumption, and sales; and export-control developments in the United States.

LABOR INFORMATION BULLETIN—U. S. Department of Labor. Monthly. 18 pp. average. \$1.25 a year, limited free list.

Summarizes news about labor and Government in news magazine style. Contains brief articles on recent events about domestic and international labor and condensed reports on recent Labor Department studies and surveys.

OUR PUBLIC LANDS—Bureau of Land Management, Department of the Interior. Quarterly. 20 pp. average. 60 cents a year, limited free list.

For the exchange of ideas and information on the development, utilization, and conservation of public lands and the timber, range, water, and mineral resources of those lands. [The Bureau of Land Management manages nearly 500 million acres in the United States and Alaska.]

PERFORMANCE, THE STORY OF THE HANDICAPPED—The President's Committee on Employment of the Physically Handicapped, U. S. Department of Labor. Monthly. 16 pp. Free.

Published to bring about a better understanding of the real abilities of the physically impaired and to provide a medium for the exchange of ideas and information that will be of value in furthering employment opportunities for the physically impaired.

PUBLIC HEALTH REPORTS—U. S. Public Health Service. Monthly. 125 pp. average. \$4.25 a year, limited free list.

Publishes material dealing with the technical and professional aspects of public health practice, administration, and research.

SOCIAL SECURITY BULLETIN—Social Security Administration, Federal Security Agency. Monthly. 32 pp. average. \$2 a year, single copies 20 cents, limited free list.

Reports current data on operations of the Social Security Administration and the results of research and analysis pertinent to the social security program. Issued primarily for agencies concerned with the administration of the Social Security Act.

THE LABOR MARKET AND EMPLOYMENT SECURITY—Bureau of Employment Security, U. S. Department of Labor. Monthly. 66 pp. average. \$3.50 a year.

Provides information on current labor market developments, trends, problems and changes, together with analytical discussions of Employment Service and Unemployment Insurance program developments and selected current operating statistics. The labor market studies are divided into three groups: area, industry, and occupations.

U. S. NAVY MEDICAL NEWS LETTER—Bureau of Medicine and Surgery, Department of the Navy. Biweekly. 36 pp. average. Restricted free list.

A service publication for members of the Navy medical department and others, designed to keep men in the field up to date. Thus, it includes abstracts of current literature, notices and directives, and circular letters. Original material from individuals in the Armed Forces, Public Health Service, and others is often included.

RECOMMENDED READING

Kilgus, J. F., Jr.: Industrial medicine as a legitimate field for the general practitioner. *Connecticut M. J.*, 16: 278-280 (April) 1952.

Pearce, S. J., and Berger, L. B.: List of Respiratory Protective Devices Approved by the Bureau of Mines. *Bureau of Mines, Information Circular 7636*. U. S. Dept. of the Interior, Washington, D. C. (June) 1952.

Stone, R. S.: The concept of a maximum permissible exposure. *Radiology*, 58: 639-661 (May) 1952.



NATIONAL BUREAU OF STANDARDS ESTABLISHES PROGRAM OF RADON MEASUREMENT AND CONTROL

TO PROTECT the health and safety of personnel engaged in work involving the handling or processing of radium the National Bureau of Standards maintains careful check, throughout the United States, over the quantity of radium ingested by such personnel and over the quantity of radon present in their working areas. The breath of these workers or the air in the work room is sampled periodically and is measured for its content of radon, the gas produced by radioactive disintegration of radium. This analysis reveals the amount of radioactivity present and provides the basis for the establishment and maintenance of proper safety measures.

The radon testing program was inaugurated in 1941 when the Surgeon General's office requested the Bureau to establish a program designed to prevent injury or death to personnel working with radium. Using highly specialized electronic equipment and ionization chambers that are continuously monitored by the national standards of radioactivity, the Radon Testing Laboratory has developed a method for measuring radon of very low concentration to a high degree of precision. As a result of the cooperative efforts of the Bureau and the officials and hygienists responsible for the protection of the workers from unsealed radium, deaths and injury from radium poisoning such as occurred in the years following the First World War are now being prevented.

Radon determination makes possible the rapid evaluation of the radon content of air in work and storage rooms, radium processing plants, and mine areas. Radon measurements can thus be used to determine whether the maximum permissible dosage limits are being exceeded or whether sufficient ventilation has been provided. In the case of personnel engaged in the handling or processing of radium, radon measurements of breath samples give an indication of the amount of radium ingested either by inhaling airborne particles or transfer of contamination from the hands to the mouth.

Samples for radon determination are submitted periodically by both private and government agencies. The majority of the government agencies have a health physics division within the agency which specifies the maximum permissible limits¹ of radon and investigates the cause of excessive values when such are indicated by the Bureau's reports. For private organizations, the State health department performs this function. Still other large agencies maintain their own health officer or hygienist. Other installations, such as uranium mines, are under surveillance of the Public Health Service of the Federal Security Agency, working in conjunction with certain State health departments.

¹ Certain maximum values for some types of radiation are recommended by the National Committee on Radiation Protection; other values have not yet been definitely fixed.

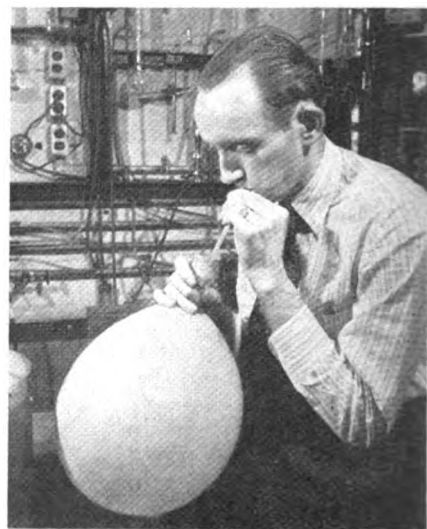


A sample of breath submitted by a manufacturer of radium-painted dials is being drawn off from a sampling flask in the radon testing laboratory at the National Bureau of Standards. After introduction into the ionization chamber (lower right), the radon content of the sample is measured by a count of the alpha particles which are emitted in the process of the disintegration of radon.

In addition to the provision for periodic tests, sampling flasks and stand-by equipment must always be kept ready for emergencies, such as accidental spilling of radium or the failure of automatic devices for remote control of measuring or hospital equipment. When such accidents occur, samples of room air as well as expired air samples from personnel exposed to the damaged material are collected and submitted to the Bureau for radon determination. Samples taken soon after the accident give an indication of the extent of the danger, while follow-up samples show the efficiency of whatever decontamination procedures have been used and possibility of permanent injury to employees.

For the sake of complete uniformity, sampling flasks for the collection of all air samples are supplied by the National Bureau of Standards. These pyrex flasks, of 2-liter capacity, are evacuated in the laboratory and sent out, upon request, packed with foam rubber in aluminum shipping containers. After being filled with room or mine air or exhaled air, the flasks are returned for determination of radon content. Workroom air samples are collected by opening the stopcocks on

The quantity of radium ingested in the system of personnel is indicated by the amount of radon in their exhaled breath. A sample of the worker's breath to be analyzed at the National Bureau of Standards is obtained by the inflation of a balloon as illustrated here.



the evacuated flask so that the air flows in through a filter. Breath samples are obtained by transferring exhaled air from previously inflated balloons into the evacuated flask through its stop-cock.

The samples, especially those of breath, must be sent to the Bureau immediately because measurements on weak radioactive air (such as the average breath sample) must be made within 10 days of the collection date. Radon has a half life of slightly less than 4 days, and detection is very difficult after more than 10 days have passed.

Radium Assays by the Radon Method

More recently the National Bureau of Standards has expanded the scope of its radon program to include the determination of radon content of water samples from lakes, rivers, and wells, particularly those subjected to naturally occurring radioactive deposits or waste from radium processing plants. Tests are also made of the air from mines where uranium and its associated products are being extracted or where there is a possibility that these substances may occur in conjunction with other mined ores.

The amount of elemental radium present in any ore, rock, or other solid material in amounts as low as 10^{-12} gram per gram of material may be measured by the NBS radon method, which can distinguish radium from other radioactive elements such as mesothorium or uranium. This distinction is possible because other gaseous alpha emitters such as thoron (which might be present) are relatively short-lived as compared to radon. Thus, if several hours are allowed for their decay after transfer to the chambers, only those counts due to radon and its decay products, plus those of the chamber background, will be recorded.

The radon method is most useful when the radium content of the samples is less than 10^{-7} gram per gram of solid material or per liter of liquid. When the concentration of radium in samples is as low as this, ordinary methods of assaying are not sensitive enough, and assaying involves the national standards of measurement as well as rigorous control over the analysis process if adequate precision in the results is to be obtained.



GEORGIA

Personnel.—Dr. Lester Petrie, director of the preventable diseases division of the Georgia Health Department, left on September 14 for a 3-month stay in Turkey, to plan an industrial hygiene program under the auspices of the UN's World Health Organization.

The program calls for eliminating dangers from gases and dusts in plants, conducting group clinics, making health surveys, and carrying out health education activities in industrial areas.

Dr. Petrie last year was chairman of the American Conference of Government Industrial Hygienists. He was formerly head of the industrial hygiene division of the State Health Department.

Mrs. Petrie, a physician on the staff of the DeKalb County Health Department, and their son and daughter are accompanying Dr. Petrie.

MASSACHUSETTS

Personnel.—Dr. Clarence C. Maloof, physician for nearly 5 years, and Mr. George W. Boylen, chemist for almost 3 years with the Massachusetts Division of Occupational Hygiene, have resigned to accept positions in private industry.

TEXAS

Personnel.—Mr. J. Henry Pederson has resigned from the Fort Worth District Office to accept employment with the American Cyanamid Co. at its plant in Fort Worth.

Mr. Alton Diserens of the San Antonio District Office is now on leave of absence for the purpose of obtaining his masters degree in industrial hygiene at Harvard. Mr. Diserens was one of the recipients of the four new AEC scholarships now being granted in the field of industrial hygiene.

Lectures on Noise Published

The in-service training course on *The Acoustical Spectrum* presented at the University of Michigan February 5 to 8, 1952, was an outstanding success. In a well-arranged program, some 25 lectures, together with exceptional demonstrations and motion pictures, were presented by authorities who discussed every facet of "Sound—Wanted and Unwanted."

These lectures have been published in a volume which should be in the possession of everyone who is interested in or faced with the necessity of doing something about noise.¹ The plant manager, the research worker, the community planner, the physician, the attorney, the

industrial hygienist—all will find answers they are seeking. They will also find questions, but with them an appreciation of why every answer is not immediately at hand.

The first part of the book discusses sound and methods for its measurement and analysis. Ultrasound and mechanical vibration are also covered. This is followed by detailed consideration of biophysics of sound perception with regard to anatomy and physiology, together with discussions of the pathologic and psychologic effects of excessive noise. Audiometry and procedures for investigating noise problems in industry are presented. The control of various types of noise, including industrial, traffic, and community noises, comes in for full review.

All of this leads to the consideration of the pressing industrial problems of standards and compensation. The final chapter presents a summary of the entire course.

¹ *Noise: Causes, Effects, Measurement, Costs, Control.* The University of Michigan School of Public Health and Institute of Industrial Health, Ann Arbor. 192 pp., \$5 (single copies).

SIDNEY HILLMAN HEALTH CENTER

REPORTS on FIRST YEAR of SERVICE

On April 14, 1951, the Sidney Hillman Health Center of New York was dedicated, and on April 16 its doors were opened to provide medical services to the 35,000 members of the 26 local unions which make up the New York Joint Board of the Amalgamated Clothing Workers of America. As soon as approval is received from the New York State Department of Social Welfare, the wives of the union members will be permitted to enroll on a voluntary basis. The record of services rendered in the first year has given great satisfaction to the leaders of the union and the New York Clothing Manufacturers' Exchange who had devoted a great deal of thought, effort and time to the creation of this living monument to Sidney Hillman, the first president of the ACWA.

Although the members were receiving a wide range of social benefits as a result of collective bargaining, the leaders of the New York Joint Board were working on a program for several years to provide their members with preventive and curative medical care which was urgently needed. The addition of this service would round out their social insurance program which already included maternity benefits; surgical and hospital indemnification; retirement rights; and unemployment, disability and life insurance.

In September 1947, it was suggested by Louis Hollander, co-manager of the New York Joint Board, that \$1,000,000 of the money which had accrued in a joint employer-union fund collected for various industrial purposes should be assigned to the construction of the Center. The employers readily and gladly agreed. A building was purchased on East Sixteenth Street in the heart of the men's and boys' clothing industry. It was renovated and fully equipped with modern apparatus to provide service to the members who would come to the Center for their medical needs.

The Center

Four floors of the six-story building are fully occupied. The upper two floors have been reserved for expansion

By Morris A. Brand, M. D.

for anticipated future demands. The renovations and furnishings have been made with an eye to providing medical care in an attractive, pleasant, relaxed, well-lighted atmosphere. The use of multiple small waiting areas removes all possible semblance to the usual hospital outpatient department. Individual dressing rooms permit the patients to prepare themselves for the doctors' examinations and avoid waste of the doctors' time.

The equipment includes two diagnostic radiographic units, one for general and the other for genitourinary examinations; superficial and deep roentgen therapy units; electrocardiograph and basal metabolism apparatus; physical therapy units; and other instruments for the diagnosis and treatment of ambulant patients.

Medication prescribed by the physicians at the Center is dispensed in the Center's pharmacy at a nominal cost. Prescribing is based on a drug formulary which was approved by a drug committee composed of five physicians and the pharmacist. Additions to and deletions from the formulary are controlled by this committee.

Organization.—The Center's activities are controlled by a board of directors and a medical advisory council. The board of directors has 21 members, 15 representing the union and 6 the employers. This board establishes over-all policy regarding eligibility of members, finances, and other related business matters. The board is guided in professional matters by the recommendations of the Medical Advisory Council.

The Medical Advisory Council is responsible for all professional matters, making its recommendations to the medical administrator and the board. The council has adopted minimum professional standards for the selection of physicians, the types of medical serv-

ices rendered, the extent of preventive medical inventory, and other subjects related to the Center's professional activities.

The Administration and Staff.—The administrative responsibilities have been delegated to the medical director and a business manager. Although the latter is responsible for employment and supervision of the nontechnical personnel, purchasing, and housekeeping, practically all activities of any importance are discussed with the medical administrator.

Biweekly meetings with the supervisors are held to discuss the Center's activities. Also, meetings with the staff are held bimonthly.

The Medical Staff.—There are 25 general physicians and 55 specialists on the staff. These physicians have been selected in accordance with the qualifications adopted by the Medical Advisory Council, and they provide their services in accordance with an established clinic schedule. Each session is at least 2 hours. Physicians have provided from 2 to 20 hours per week, depending upon their availability, their length of service in the Center, the demand for services, and the frequency of referrals. Variation of clinical hours also has depended on the working hours of the members and the amount of work in the industry. As is well-known, the men's clothing industry has been at a low ebb in the past year permitting many members to obtain medical care which otherwise they would have been too busy to seek.

During the period April 16, 1951, to March 31, 1952, the physicians provided 17,465 hours of service, 9,676 by general physicians and 7,789 by specialists, about 55.5 percent and 44.5 percent, respectively. This is an average of 3 services per hour by the general physician and 3.9 per hour by the specialist.

There are 4 registered nurses, 1 nurse's aide, 2 registered pharmacists, 2 radiology technicians, 4 laboratory technicians, 2 registered physical therapists, 1 physical therapy aide, a supervisory librarian, a registrar, clerks, stenographers, secretaries, porters, and

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a bookkeeper, in all a total of 47 full-time persons.

Each technician has been selected on the basis of training and experience. Selection of each staff member has been based on ability, adaptability, pleasant personality, and understanding that kindness and consideration to the patients will go a long way in acquiring and maintaining faith and confidence in their Center.

Report of Services.—In the 11½-month period between April 16, 1951, and March 31, 1952,* 10,090 members received services in the Center. Of these more than 5,000 registered in the first 3½-month period ending July 31, 1951.

The 10,090 members received 59,956 physician services, including 29,703 by general physicians and 30,253 by specialists.

The following departments provided the number of services indicated at the Center during this period: Allergy, 3,088; cardiology, 532; chest, 152; dermatology, 1,527; diabetes, 742; electrocardiography readings, 3,399; gastrointestinal, 194; gynecology, 535; internal medicine, 352; medical "L" (antiluetic), 241; neuropsychiatry, 680; ophthalmology, 4,528; orthopedics, 1,253; otolaryngology, 2,832; peripheral vascular, 415; physical medicine, 1,738; proctology, 1,000; radiology, diagnostic, 4,501; roentgen therapy, 59; surgery, general, 1,033; urology, 1,452.

Diagnostic procedures performed totaled 48,988, including 4,501 radiographic examinations; 179 basal metabolism tests; 3,399 electrocardiograms; 34,980 blood chemistries, urinalyses, and hematological studies; 5,859 photofluorograms of the chest, and 70 biopsies and miscellaneous. Also, 13,088 ancillary therapeutic services were rendered. These included injections by nurses, psychiatric and rehabilitative treatments and roentgen therapies. The Center's pharmacy billed 25,751 prescriptions.

Neither psychiatric treatments nor dental care is included.

In addition, arrangements have been made with two hospitals to provide the members with radioactive iodine tracer studies and treatments at nominal rates.

*It was agreed that the second fiscal year should begin on April 1, 1952.

The members pay an annual fee of \$10 for the medical services. In addition, each patient is required to pay small sums for certain laboratory, X-ray, and physical therapy services.

Although it is difficult to know to what extent these additional fees have acted as a deterrent, it is certain that in some instances some members did not always avail themselves of the services and others did not wish to undergo some of the diagnostic procedures. In keeping with the approach that medical care of the worker (and his family) is as important an item for collective bargaining as are wages and hours, the New York Joint Board intends to request the employers to participate in the medical-care program. The industry's leaders have acknowledged the value of the Center's services, and it is expected that they will accept their responsibility willingly. Their contribution will make it possible to remove the additional charges other than for medication.

Service to Outside Physicians.—An important service available to the members is demonstrated by the number of services rendered to nonstaff physicians. This service permits a patient-member to send to his local family doctor an abstract of the history, examination, tests, and treatments. X-rays are also sent to the physicians. The Center, in addition, provides the family doctor with a report of laboratory tests and consultations performed in the center in accordance with their requests.

Quality of Medical Care.—One of the most important responsibilities of a medical service program is to develop and maintain a high quality of medical service. In order to be certain that the members obtain good medical care, the medical director appointed an internist as chief of clinic for each clinic session. The clinic chiefs are available to physicians for immediate short conferences in problems of diagnosis and treatment and for consultations for urgent and emergency situations. One clinic chief reviews a number of medical charts of the previous day's sessions to evaluate the service rendered. He also is assigned to review the activities of physicians newly added to the staff, and any shortcomings are discussed with the physicians either by the clinic chief or the medical director.

There is sufficient evidence to indicate that the clinic chief fulfills a most useful function in maintaining a high quality of service. A total of 9,144 services were rendered by the clinic chiefs from September 1, 1951 (when the recording of their activities was first started) to March 31, 1952. This includes the review of over 4,000 charts, close to 2,000 conferences with staff physicians, and almost 1,000 urgent consultations.

The Research Unit.—The research program was established by the New York Joint Board. A \$250,000-grant was made by the joint board and \$25,000 by the Sidney Hillman Foundation. The first problem under investigation is the determination of the possible relationship of dietary and ethnic background to the occurrence of arteriosclerosis.

As part of the future program, the medical director intends to stimulate employers' interest in industrial in-plant medical services. Some of the larger shops have a nurse and physician on call, but the smaller shops, as is usually the case, do not have any in-plant service.

MEDICAL PROGRAM—

(Continued from page 174)

employee to be mailed to the employee's home and in many cases another letter to the employee's family doctor. Besides the physical examination itself, the doctor will have talked to the employee about such topics as diet, exercise, rest, and recreation. He will have asked about the man's hobbies and other outside interests, about his likes and his dislikes, and he will have given him a chance to talk about his troubles in his own way.

Although it is too early to evaluate any special results healthwise because the procedure is only 2 years old, we are sure that the program is appreciated.

After we have had the opportunity of selling both preventive health and positive health to the same people two or three times, we hopefully expect that the health level of our people and their probable life expectancy will have increased materially.

Peru's Industrial Hygiene Program Develops Rapidly—Now a Training Center for South American Countries

By J. J. Bloomfield¹

PERU HAD ADEQUATE legislation for the development of an industrial hygiene department in 1947, but nothing else. After a survey of Peruvian industries proved the need, a department of industrial hygiene was established.

Equipment for the laboratory and field work was procured, Peruvian personnel were trained, and the basic groundwork laid for a good working program. Today the Department is fast becoming a training center for other Latin-American professionals in the field.

There is much to be done. The slow development of the rich natural resources in many of the countries in Latin America may be attributed partly to the numerous serious ailments which sap their labor force of vitality and productivity.

Only by an improvement of the general living conditions, therefore, may we hope to increase the productivity and purchasing power in these countries. At the same time, efforts must be made to improve the present appalling working conditions that give rise to serious health problems among the workers.

With poor dietary habits, the worker's finances make for malnutrition; with poor housing, they force him to live under actual, or little better than, slum conditions. Only a small percentage of the population in these countries enjoys the benefits of water and sewage treatment, so lack of sanitary facilities contributes to the primitive state of his existence.

Another obstacle is illiteracy, which is high in nearly all of these countries. It is difficult for a worker to increase his productive capacity and better his economic position if he cannot even read instructions on how to operate a

machine, or to do his job, or to live hygienically. What is just as important, however, is the need to inculcate in the worker a sincere desire to improve his working and living conditions, a desire now lacking in a large part of the working population.

The socio-economic conditions reflect important nonoccupational influences in the industrial population of Latin American countries. When one reviews the health problems that are directly related to the working environment, one finds many accident and health hazards in the industries of these countries. Such diseases as silicosis, and metal poisoning, and toxic exposures to gases, vapors, and fumes are common.

Industrial hygiene practices aimed at controlling accidents and occupational disease hazards are practically unheard of. The social welfare legislation, in general, is highly progressive but unfortunately the emphasis is largely on compensation rather than on prevention.

As a matter of fact, in the South American countries in which I have made studies, I obtained sufficient data to show that these countries are spending vast sums of money in the indemnification of workers for disability encountered on the job. These sums represent from 12 to 15 percent of the national income and from 36 to 50 percent of the national budget in some cases.

In frank acknowledgment of their need for improvement, many of the countries in Latin America have been requesting assistance from the United States. In view of this realization and the desire to do something about the situation, the time is now ripe for the development of realistic programs in industrial hygiene in many of the Latin American countries, particularly those which are rapidly becoming industrialized.

The health and sanitation program of The Institute of Inter-American Affairs, a federal agency of the United States, was born in Rio de Janeiro, in January 1942, at the Third Meeting of the Ministers of Foreign Affairs for the American Republics.

Under the aegis of this program, hospitals, health centers, water supply and sewerage systems, and other health and sanitary facilities have been constructed. Numerous projects have been undertaken in preventive medicine against disease problems.

In the industrial hygiene field, however, action did not begin until late 1945, when the Bolivian Government requested the United States to study the serious health problems among the Bolivian workers, particularly those employed in the mining of tin.

For the present, The Institute of Inter-American Affairs is concentrating its activities in 7 of the more highly industrialized countries. These 7 countries, with a total population of approximately 112,000,000 people, have a gainfully employed population of slightly more than 37,000,000 persons. Definite progress has been made in 5 of these countries, and the manner in which the programs have been developed makes an interesting story.

The philosophy employed in the development of industrial hygiene programs in Latin America has followed very closely the principles upon which the U. S. Public Health Service has based its work with the states. The major objective in the United States was the establishment within a State health agency, of a nucleus of trained personnel supported by the essential field and laboratory equipment, so that industrial hygiene services could be provided to the industries of the locality under consideration.

These industrial hygiene agencies also aid large industries to develop their own industrial hygiene programs. Such a plan may usually be attained with some success in a country where public health practice is already well established along modern lines.

Lacking a similar public health structure in some of our host countries, it has been found more practicable in some countries to administer the industrial hygiene program largely under the direction of trained and experienced United States personnel.

Peru's Program

The Peruvian Department of Industrial Hygiene now has a staff of approximately 45 persons, of whom slightly more than 20 are professional personnel. During the past 2½ years,

¹ Mr. Bloomfield is sanitary engineer director, U. S. Public Health Service, on detail as industrial hygiene specialist with the Institute of Inter-American Affairs.

Shortened version of address given at the Tenth Annual Meeting of the United States-Mexico Border Public Health Association, Monterrey, Mexico.

studies have been conducted in approximately 70 industries in 11 states of the country, nearly 5,000 physical examinations have been made in the course of these studies, and an additional 2,200 examinations have been made on persons claiming workmen's compensation.

This function is a service rendered to the labor courts which are adjudicating claims. This latter activity has served to establish the Department of Industrial Hygiene of Peru as the medical authority in occupational diseases.

At present, the medical examination data are being analyzed on tabulating and sorting machines. These analyses will establish the incidence of silicosis and other occupational diseases in Peru and will form the basis for the immediate steps to be taken in the control of occupational diseases in the country.

Three physicians and one engineer of the Peruvian staff have already received training in the United States in the industrial hygiene field, and one physician and one engineer, also Peruvians, are at present receiving similar training in the United States.

The other personnel are obtaining training on the job, both in the field and in the laboratory. The Department has been adequately provided with the most modern instruments, such as X-ray equipment, spectrophotometers, and polarographs, so that it has all of the tools required for the study of health hazards and the health of the workers in industry.

Hence, it is but natural that the Department has now become a training center for other Latin-American professionals. At the moment, we have in training one chemist from Chile and one from Colombia, and we are anticipating additional trainees in the next few months from Bolivia and Brazil.

The program in Peru has been well received by industry and by the other Government agencies with which the department cooperates, such as the Ministry of Labor and the Department of Mines in the Ministry of Fomento, as well as by the workers of the nation. The work of the department has grown to such an extent that it was found necessary to open a branch station in the city of La Oroya, in the Department of Junin, which is the center of the mining and smelting industry of the country. It is planned to open similar

stations in the north and in the south during the next year.

In Other Countries

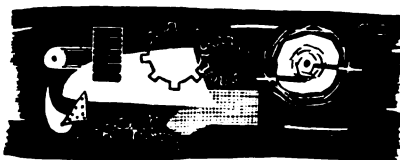
The Bolivian program, which has been largely inactive since 1947, is being revitalized by the assignment of a consultant in industrial hygiene to the field party in Bolivia, in order to help the Ministry of Labor and the National Bureau of Social Security to place their present programs on a modern basis.

This revitalization will also include the provision of field and laboratory equipment and the establishment of an industrial hygiene chemical laboratory to assist in the work. In the other countries, such as Chile, Brazil, and Colombia, we are conducting preliminary surveys for the purpose of defining the problems in industrial hygiene.

These surveys not only serve to define the problems in industry but also are an excellent introduction for both industry and the industrial hygiene personnel on how to work cooperatively toward the common objective of improving and maintaining good working conditions. Such preliminary surveys will soon be made in Venezuela and Mexico and should form the basis of constructive programs in those two countries.

These programs are being developed and guided under special cooperative project agreements, as part of the overall cooperative agreements between The Institute of Inter-American Affairs and the host country. By the end of 1952, a good start will have been made towards the development of technical, fact-finding services in the seven Latin American countries, which contain more than 70 percent of the population of Latin America.

It is our aim to develop industrial hygiene programs within each of the countries requesting this assistance. The chief function will be to guide and advise industry in the solution of its health problems and to encourage large industries to sponsor complete industrial hygiene programs of their own.



QUESTIONS—

(Continued from page 171)

those of methanol. Allyl alcohol is a primary skin irritant and when the alcohol touches the skin many times the effect is not felt for several hours. After that the area begins to ache and burn, and then a blister usually appears.

Allyl alcohol has been used in industry for many years and when used properly is no more dangerous to work with than other chemicals. However, workers with these compounds should wear impervious sleeves, aprons, and gloves, as well as goggles to protect the eyes. If any of the material gets on the skin, it should be immediately washed off. Plants using this material should also see that the area where the work is being done is properly ventilated to keep the fumes away from the workers and whenever possible totally enclosed processes should be used.

Is sodium chromate irritating to the skin?

It has been our experience that chrome salts are both common irritants and skin sensitizers; the higher the concentration, the greater the skin irritating possibilities and the lower the concentration, the more likely they are to cause sensitization reactions.

We have seen dermatitis from potassium bichromate where only extremely small amounts are used as antirust compound in air-conditioning apparatus. We have also seen dermatitis from small amounts of chrome compounds that remain in leather after it has been tanned. Numerous cases of dermatitis have been reported from chrome and its compounds in multilithing where the plates are sensitized with egg albumin containing small amounts of potassium bichromate. Dermatitis also occurs from the chromates used in blueprinting; and in the airplane industry during the war there was a high incidence of chrome dermatitis among the workers. For further information regarding chromates, I am referring you to the textbook, *Occupational Diseases of the Skin*, by Schwartz, Tullipan, and Peck, second edition, Lea and Febiger, Philadelphia, 1947, chapter 14, page 212, which discusses dermatitis caused by chromic acid and the chromates.

HARMFUL EFFECTS OF LIGHT ON THE EYES—PART II

By A. Link Koven, M. D.

SINCE the average person is more familiar with the clinical results of harmful light, the following discussion is presented in an occupational classification.

Light Stroke

This condition usually occurs in workmen exposed to such bright light as that emitted by molten metals or glowing blocks of metal, or in oxy-acetylene arc welders, and in furnace men standing before the electric furnaces. Often affected are inexperienced workers at these occupations and, in many instances where improper shielding exists, adjacent workmen at other tasks.

The immediate reaction to this type of radiation is that the worker experiences a "dazzled" state. This is followed by a loss of part of the patient's field of vision, which is transitory in nature. Some 5 to 8 hours later, the patient experiences the first sensation of pain and usually describes it as "sand under the eyelids". The conjunctiva becomes red, tears begin to flow, and the patient avoids light, which aggravates the irritation. The eyelashes become glued together by the presence of a muco-purulent secretion in the eye. At times there is an impression of a fog or haze. The entire condition usually clears up completely in 12 to 24 hours.

Welder's Flash

This condition may affect workmen engaged in electric arc welding, inexperienced apprentices, spectators, and workmen engaged in neighboring areas. A short period of exposure to the light of the arc is sufficient to produce this injury. However, usually it is caused by excessive exposure to welder's electric arc over a considerable period of time. It is a cumulative injury.

The usual course of events is that the patient does not stop his work, because he feels nothing at the time of exposure. Some 8 to 15 hours later, the patient experiences a painful sensation, of sufficient intensity to prevent sleep, becoming increasingly painful, often described as many moving foreign bodies with sharp corners under the eyelids. There is an abundant flow of tears. There is an intense spasm of

the eyelids (blepharospasm) and any attempt to raise the lids aggravates this situation. There is also extreme photophobia, the faintest amount of light increasing the pain.

Electric Arc Stroke

Synonyms for electric arc stroke are electric sunstroke, electric ophthalmica, "flash or welder's eye".

Etiology—This arc stroke affects workmen engaged in electric arc welding, inexperienced apprentices, spectators, or especially workmen engaged on another job in the vicinity of the welder. It can be produced also by the light of a high tension short circuit. A very short period of exposure to the light of the arc is sufficient to produce the injury.

Symptoms—In the milder and more commonly seen forms, the patient does not stop his work, because he feels no pain at the moment of exposure, the symptoms supervening, some 8 to 15 hours later. After exposure to the arc light, a painful sensation as of foreign bodies moving under the eyelids is experienced and often prevents sleep. A very slight conjunctival redness and some slight photophobia are present. Frequently, the patient states that he has had a sensation such as is produced by a veil before the eyes.

Some individuals complain of associated intense headaches and insomnia. There is intense swelling and inflammation of the conjunctiva and eyelids. It is very unusual for only one eye to be involved. In such conditions one should try to rule out a foreign body or early infection of the eye. Contrary to the impression often expressed by many workers, welder's flash does not occur more commonly at night.

The patient recovers completely in a few days. Although this review is not to cover treatment, it may be mentioned that adequate treatment exists so that only in the worst cases need time be lost, according to one investigator. There are two schools of thought on whether or not the ultra-violet or heat

radiation is responsible for the lesions in this condition.

Snow Blindness

This condition, which is sometimes called glacial sunstroke, snow ophthalmia or ophthalmia nivialis, is not caused by the snow, but by rays which may be reflected from snow. Skiers and mountaineers after a prolonged stay exposed to snow may be affected. It usually occurs at altitudes of over 1,000 feet and may occur in overcast weather as well as in bright sunshine.

The patient usually experiences signs of irritation, and feels as if he has sand under his eyelids, after approximately 10 hours of exposure to the sun. The conjunctiva becomes red and swollen; pains in forehead and photophobia occur. In severe cases, one can see erosions on the cornea. The patient is prevented from opening his eyes because of the violent spasms of the eyelids.

These are the cases which are referred to inaccurately as "snow blindness" since the patient is prevented from seeing because of the intense spasm and swelling of the lids. When the acute symptoms subside the patient usually complains of a dazzled condition, later on a sense of failure of the illumination of objects, and also of seeing black or red spots, or even a large central area of darkness. In a few days complete recovery occurs. Suffice it to mention that there is adequate treatment, but emphasis should be made on preventive measures.

Red Vision (Erythropsia)

If a person be exposed to an intense light for some time, a red vision or erythropsia develops. Although this was long known, it was originally kept secret, because of evil connotations that were attached to it. This phenomenon was first noticed in patients after cataract operations in 1879. Red vision is commonly experienced in individuals exposed to prolonged glare as from snow, water, and that which is experienced in motion picture and television studios.

There appears to be divided thought as to the cause of this condition. One group believes that ultra-violet rays must play a dominant role in the de-

Dr. Koven is associated with the University of Pennsylvania Graduate Hospital, Philadelphia.

velopment of red vision. Another group believes that erythroptosis to be merely the red phase of the after-image resulting from dazzling white surfaces.

Conjunctivitis in Motion Picture Studios (Klieg Lights)

Powerful arc lamps or mercury vapor lamps were formerly used to light up motion picture studios. Eye injury because of this type of illumination was quite high (20 to 70 percent according to statistics collected by Couteta). These lamps have been long replaced by improved light fixtures, and with it have gone the high frequency of eye complaints.

The symptoms which would come on 7 to 8 hours after exposure to these rays, were watering of the eyes, swelling of the eyelids, redness of the conjunctiva, and a sensation of pin pricks under the eyelids. Headaches and sleeplessness due to the eye pain occurred. Under special methods of examination of the eye, erosion of the cornea could be seen.

In spite of the violence of the symptoms, complete recovery has been obtained in 2 to 3 days. In some cases however, blurred vision and inflammation of the eyelids persisted for a period of time.

Radiational Cataract (Glassblower's Cataract)

As early as 1739, Heister noted the relationship of heat to cataract. Wenzel in 1786 stated that individuals exposed to fire frequently developed cataract. In 1830, Mackenzie stated that glassblowers and workers exposed to strong fires are subject to cataract.

Glass blower's cataract is not confined to glass workers but is also found in other workers exposed to glowing heat, such as iron smelters (puddlers), chainmakers, tinplate millmen, gold-smelters, and machinists.

Legge in 1915, found in 87 glassblowers over 30 years of age, 22 cases of cataract. He found that in glassworkers between thirty and forty years of age, the incidence of cataract was five times that found in the normal population.

The greater incidence of heat cataract among old workmen is not only due to the greater number of years of exposure to heat, but also to the fact

that the older lens absorbs more infrared rays than the younger and softer lens.

Ultraviolet rays were thought by some writers to be active in the production of heat cataract. This theory has been disproved many times, especially by Crookers' demonstration showing that the chief rays emitted from glowing glass are infrared, with the radiation decreasing towards the violet end of the spectrum. Whereas the great majority of investigators believe that glass blower's cataract is produced by the action of infrared rays ranging from 7,500 to 24,000 Angstrom units, the exact genesis is still unsettled.

The prevention of this condition depends upon the provision of suitable screening devices, in the form of shields or goggles. There is an obvious practical difficulty in the latter form of protection, because in absorbing the heat rays the goggles themselves become heated, causing considerable discomfort to the worker. Furthermore, goggles may reduce the amount of light transmitted by as much as 60 percent.

Eclipse Blindness

This type of blindness occurs periodically during the occasion of an eclipse. Individuals who are not aware of the dangers attendant upon gazing at an eclipse are the victims. Some have imagined that the use of a mirror would eliminate the danger, which is erroneous because the mirror reflects the rays to the eye. Insufficiently smoked glasses may fail to provide adequate protection. Eclipse blindness is due to focusing of heat on the macula, the center of fine visual acuity. Usually the better eye is used for gazing at the eclipse.

The symptoms of eclipse blindness do not appear for several hours or a day following exposure. The patient experiences a partial loss of visual field, metamorphopsia (change in shape of objects) and erythroptosis (red tinge to objects). In mild cases, the loss of visual field is transient, but in moderate and severe cases there is permanent partial loss of vision and permanent loss of part of the visual field. In some cases a permanent defect for yellow has been described.

Walsh relates "that during World War II many antiaircraft personnel

suffered from macular lesions seemingly a result of injury to their eyes while searching for enemy aircraft because they were unable to avoid looking directly into the sun. Undoubtedly the condition from which they suffered is similar to that which has been known to occur from gazing at an eclipse."

In passing from clinical states due to excess of radiation to that of deficiency of radiation, it seems fitting to mention the many important articles which report that an increase in illumination results in better visual acuity. The duplicity theory of vision assumes that the retina is composed of two separate sense organs, one (rods) working at low intensities of illumination, the other (cones) at high intensities. The increase in visual acuity with increasing illumination supports this theory. A number of factors have a profound effect on the relation between visual acuity and illumination, such as pupil size and the contrast between test object and the surrounding field. Lythgoe in his studies controlled not only the illumination of the test object and the surroundings, but also the subject's state of adaptation, and found that:

(1) When the subject is dark-adapted, the visual acuity increases up to a maximum of 15 Equivalent Foot Candles and then falls.

(2) If the subject is only partly dark-adapted, and the illumination is about the same, but not much greater than the test target, the acuity increases to a maximum at approximately 40 E. F. C. and then falls.

(3) If the subject is light-adapted the visual acuity continues to increase in the illumination of the test target.

With the mention of these normal relationships, we can consider the clinical state due to deficiency of light.

Miner's Nystagmus (Dancing Eyes)

By the term nystagmus is meant a condition wherein the eyes involuntarily oscillate rapidly either in a vertical or a horizontal direction, or it may be described as rotatory or rolling movements of the eyes.

This condition is rarely seen in miners in this country. However, in Great Britain and on the continent, it is an occupational disease of great importance.

The cause of miner's nystagmus is still indefinite. Some investigators be-

lieve it is due to the need on part of the miner to look upward constantly while undercutting the seam of coal. Some believe it to be a neurosis. However, more and more investigators are beginning to believe it due to defective illumination.

Miners' nystagmus is noted most frequently in individuals who are above ground only at night. Wilson cites a case of a miner who, while working in a mine in Scotland, developed nystagmus, which disappeared while he worked in a mine in America and returned when he again worked in a mine in Scotland.

In addition to the nystagmus, photophobia and anesthesia of the cornea occur. Night blindness is an early symptom. Walsch describes giddiness as a prominent symptom which may be associated with apparent movement of objects. Tumors of the eyelids, hands and head may occur in association with the nystagmus. The only treatment recommended for these patients is that they be provided with surface work immediately.

BIBLIOGRAPHY

Adam, A. L., and Klein, M.: Electrical cataract. *Brit. Jr. Ophthalm.*, **29**: 169 (1945).

Atkinson, E. L.: Snow blindness; causes, effects, prevention and treatment. *Brit. Jr. Ophthalm.*, **5**: 49 (1921).

Drinker, P.: Measurement and prevention of eye flash (in arc welding). *Sight Saving Rev.*, **14**: 166-169 (1944).

Duke-Elder, S.: Ultraviolet light in the treatment of ophthalmic diseases. *Brit. Jr. Ophthalm.* **12**: 289 (1928).

Enloe, C. F. Jr.: Effects of radiant energies on eye. *Sight Saving Rev.*, **18**: 77-83 (1948).

Fleischer, W. E.: Ophthalmic effects of welding radiation. *Jr. Amer. Acad. Ophthalm.*, **51**: 667-671, Aug. (1947).

Friedenwald, J. S., et al.: Comparison of effects of mustard, ultraviolet, X-radiation, and colchicine on cornea. *Bull. Johns Hopkins Hosp.*, **82**: 312-325, Feb. (1948).

Genet, L.: Clinical Lesions due to Radiant Energy, *Modern Trends in Ophthalmology*. Edited by A. Sorsby. Paul B. Hoeber, New York (1947). vol. 2, p. 201.

Goldmann, Hans: La genese de la

cataracte des veniers. *Ann. Oculist.*, **172**: 13 (1935). Paris.

Kinsey, V. E.: Spectral transmission of eye to ultraviolet radiation. *Arch. Ophthalm.*, **39**: 508-513, April (1948).

Kinsey, V. E., et al.: Measuring eye flash from arc welding. *J. A. M. A.*, **123**: 403-404, Oct. (1943).

Kutschner, C. F.: Effects of radiant energy. *Jr. Amer. Acad. Ophthalm.*, **50**: 230-241, July-Aug. (1946).

Rieke, F. E.: "Arc Flash" conjunctivitis, actinic conjunctivitis from electric welding arc. *J. A. M. A.*, **122**: 734-736, July (1943).

Savin, L. H.: The causation and incidence of fatigue in the cinema. *Lancet*, **1**: 1433 (1931).

Sheppard, B.: Eye injured by lighting, pathologic changes. *Amer. Jr. Ophthalm.*, **28**: 195-198, Feb. (1945).

Tower, P.: Solar retinitis due to exposure to eclipse. *Ann. West. Med. & Surg.*, **2**: 217-221, May (1948).

Turtz, C. A.: Solar burns of fundi. *N. Y. St. Jr. Med.* **48**: 2489-2490, Nov. (1948).

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CONNECTICUT NEEDS PHYSICIAN

The Connecticut State Department of Health announces a vacancy for the position of industrial hygiene physician. Basic requirements are United States citizenship, completion of a general internship in an approved (A. M. A.) hospital and eligibility for licensure in Connecticut, a master's degree in public health, and 1 year's employment in work involving the effect of the industrial environment on health. Equivalent experience, however, may be considered in lieu of the master's degree. The salary range is \$6,540 to \$8,340. Appointments may be considered above the minimum. Further information may be obtained from the Division of Personnel, Connecticut State Department of Health, Hartford.

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