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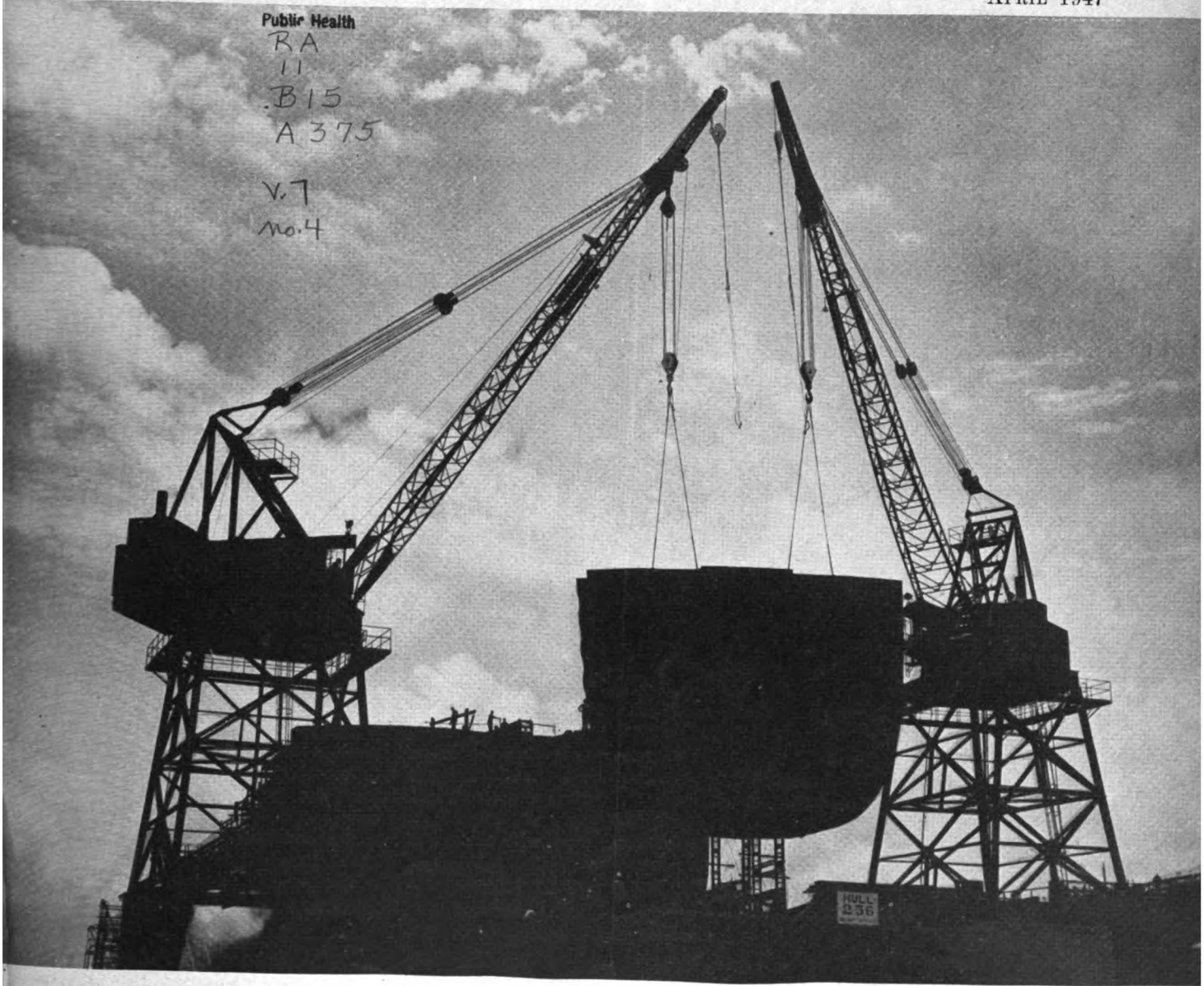

NEWSLETTER

INDUSTRIAL HYGIENE NEWSLETTER

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REPORT OF HEALTH SURVEY OF SHIPYARD WELDERS COMPLETED

Occupational health hazards encountered by wartime welders in shipyards are only minimal, according to the conclusions drawn after the completion of a study of almost 5,000 men and women who worked in seven of the Nation's leading shipyards during the war.

The U. S. Public Health Service, the U. S. Navy, and U. S. Maritime Commission cooperated on this project. The immediate reason for the study was an increasing number of complaints of respiratory illnesses among shipyard workers, most of them appearing to originate with electric arc welders who worked in inner bottoms or in other confined spaces while engaged in new ship construction.

The seven shipyards selected for medical study were located on the Atlantic, Pacific, and Gulf coasts in order to get a representative sample of climatic and working conditions. Although details varied, all seven shipyards used modern, all-welded construction on a mass production basis.

Physical examinations were made of 4,650 individuals, of whom 63 percent were males and 37 percent females. The examining physicians used a sampling method designed to secure a representative cross-section of the various welding crafts, shifts, and working locations. Approximately one out of every four persons examined was a nonwelder, and the medical findings of this group served to control the clinical observations.

Fume samples were collected near the breathing level with a specially adapted precipitator and were analyzed for iron and total fume. Oxides of nitrogen were obtained at the same time by means of gas sampling tubes.

ENVIRONMENTAL RESULTS—Iron and total fume determinations were made on 1,767 welding fume samples, and zinc and lead analyses were carried out on 278 and 25 of these samples, respectively. The highest average iron and total fume concentrations were found, as was expected, in the most confined welding locations.

The analysis of all the welding fume samples brought out the following approximate composition of the fume produced from welding on bare steel with coated electrodes: ferric oxide, 50 percent; titanium dioxide, 15 percent; silica, 8 percent; and a mixture of acid-soluble metals such as magnesium, calcium, aluminum, manganese, chromium, copper and sodium, 24 percent.

More than half the gas samples from the shipyards contained less than five parts per million of oxides of nitrogen. The highest proportion of samples exceeding 25 parts per million of nitrogen oxides was 10.4 percent on subassembly inner bottoms, followed by 5.8 percent on the top deck and outside shell of the hull and 4.5 percent in the pipe shop. In no location did the mean value for the nitrogen oxide samples reach as much as 9 parts per million.

MEDICAL FINDINGS—The occupational experience of workers before coming to the shipyards showed great diversity. Shipyard work was most attractive to persons who formerly had been engaged in farming and those in the trade or service industries. In four of the shipyards more than half of the women had not previously been gainfully employed. Of the male welders, 8.1 percent had welded in the shipyard

for more than 3 years but no female welders had worked this long.

In the medical examination, special attention was paid to the upper respiratory tract. However, it is difficult to distinguish the effects of welding fume from effects of an infectious or allergic nature. Conjunctival irritation was slightly more prevalent among welders than nonwelders of both sexes. Inflammation of the nasal mucous membrane as evidenced by congestion was slightly more common among welders than nonwelders in each shipyard, but the degree of inflammation rarely progressed to ulceration.

Pharyngitis was observed more frequently than other respiratory findings and was of greater severity among welders than among nonwelders. It was observed less often among females than among males.

A distribution by age of mean systolic blood pressure values for welders compared with the values for nonwelders showed that in each sex and color group welders had a lower mean systolic blood pressure. In a group where special attention was paid to discovering slag burns or scars their presence was observed in about one-fourth of the welders.

No important differences were observed in the lung-field markings in the chest X-rays of welders and nonwelders. By including other findings in addition to the X-ray reading, however, arc welder's siderosis was diagnosed in 3 percent of the male welders.

The percentage of shipyard workers with reinfection tuberculosis was 1.3 percent, or approximately the same as among other industrial populations. The proportion of moderately or far advanced cases was lower than usual which may have been due to self-screening of those more seriously affected. The shipyards which included preplacement examinations in their health maintenance program had a smaller proportion of tuberculosis personnel.

Because welding fumes may potentially produce anemia, careful attention was given to the blood picture, but the results indicated no appreciable difference between welders and nonwelders There was some evidence that persons doing galvanized welding and exposed to zinc fume are more likely to have abnormal sedimentation rates than those not so exposed.

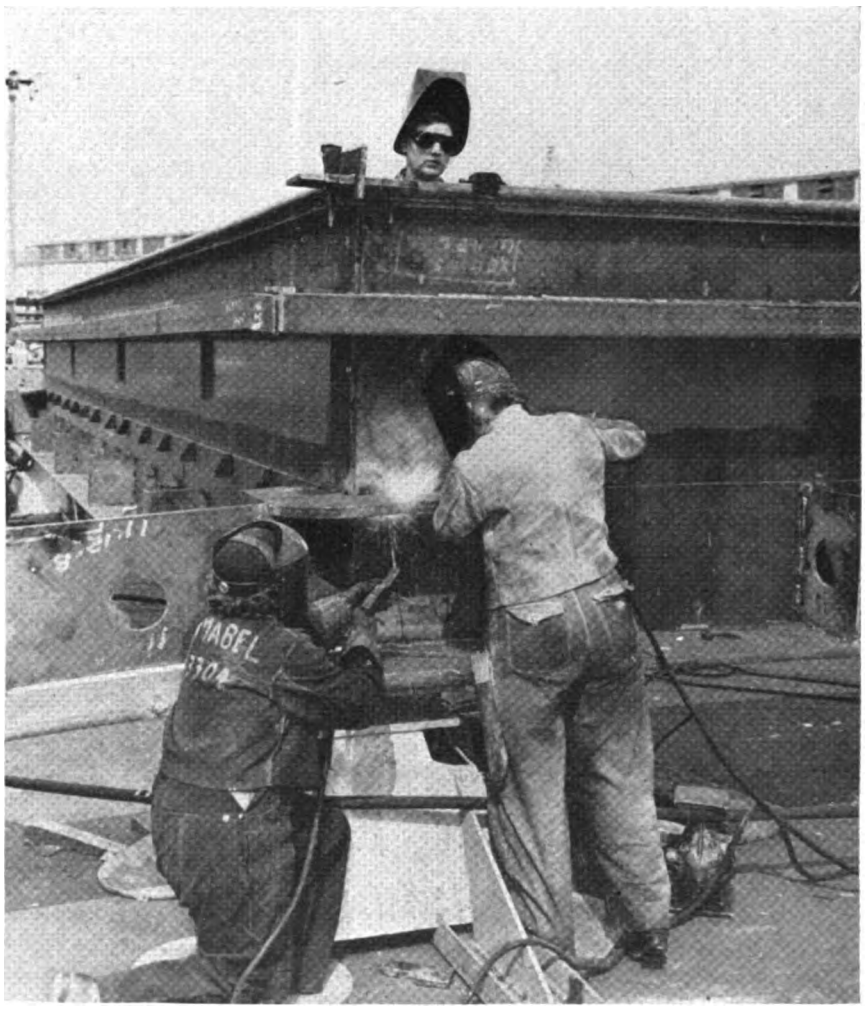
DISCUSSION—In general the concentrations of welding fume and gas observed in the environmental phases of the study were relatively low and the clinical findings were minimal. Findings which approach or are of bare clinical significance for welders include the respiratory syndrome complex, related to the irritant fumes and gases;

(Continued on page 9)

COVER PICTURE

The setting sun silhouettes two giant cranes lifting a forward cofferdam into place in one of the Nation's shipbuilding yards. These two cranes pool their power to lift the 80-ton prefabricated weldment into position for exact fitting and trimming before it is welded into place to become part of the ship. The health hazards of welding in the shipbuilding industry was the subject of thorough study by the U. S. Public Health Service.

Photograph by courtesy of U. S. Maritime Commission.



Courtesy of U. S. Maritime Commission.

These women welders encounter practically no health hazards when they work in the open air. The proper headdress, goggles and other clothing designed for the job are essential to safety.

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RIGHT EYES FOR THE RIGHT JOB

Testing Vision in Industry

A. Link Koven, M. D.,
U. S. P. H. S.

Both efficient machines and efficient operators are vital for maximum production. Proper vision is an important factor in industrial efficiency and has a marked bearing on output and on safety.

Adequate measurement and classification of visual requirements of a job is one of the most effective means of determining the potential efficiency of applicants for jobs. By the same means, it is possible to increase the efficiency of employees on the job. Some of the more common methods of testing vision in industry will be discussed briefly.

A. Snellen Charts

The most common test for vision in industry is the use of the familiar letter chart at the standard distance of 20 feet for far vision, and the small reading card at 16 to 14 inches from the employee's eyes, for near vision. The use of the Snellen charts in the measurement of visual acuity is only *one step* in the eye examination of an employee. To base criteria of visual aptitude on this one test is inadequate and haphazard. For example, a far-sighted man, passing the Snellen test may be very inept, clumsy, and accident-prone at a working distance of 12 or 10 inches. Other visual skills have to be determined for an adequate visual examination.

B Visual Screening Tests (Battery of Tests)

The Snellen charts represent only a measure of the ability of the eyes to discriminate black and white detail at some standard distance (central visual acuity). Often, the distance at which the work must be performed is not considered in making and evaluating these tests.

Vision is a complex act, requiring individual excellence, as well as many coordinated functions where both eyes must work in unison. To understand the need of testing several visual skills in an industrial eye examination, it would be well to review, very briefly, the functions of the eye.

FUNCTIONS OF EYE

A. *Essential*
1. Visual acuity.
2. Field of vision.
3. Muscle function (binocular vision).

B. *Nonessential*
1. Depth perception.
2. Fusion sense.
3. Positional sense.
4. Orientation.
5. Motion sense.

C. *Auxiliary*
1. Accommodation.
2. Pupil adaptation.
3. Dark and light adaptation.
4. Lid action.
5. Function of lacrimal glands.

D. *Color vision*

Certain of these functions are considered basic visual data which industry needs in appraising the employee for his job.

BASIC VISUAL INFORMATION FOR INDUSTRY (KUHN)

1. Acuity for distant- and near-vision without glasses.
2. Acuity for distant- and near-vision with glasses.
3. Muscle imbalances (phorias) for distance and near vision.
4. Depth perception (stereopsis).
5. Color appreciation levels.

To these may be added careful diagnostic appraisal of near vision (near point acuity, near point accommodation, near point of convergence, lateral and vertical phorias and others) for applicants for jobs requiring exact visual perception at working distances of less than 14 inches and especially in employees over 40 years of age. Desirable information also of assistance in determining the employee's visual skill, but not often readily available in industry, is related more specifically to the health rather than to the efficiency of the eye; for example, the estimate of the tension, perimetric, and ophthalmoscopic findings. In some cases speed of vision and recovery from glare may be important for some jobs.

The significance of any single one of the above tests depends entirely on the job that the employee is on or to be put on. There must be a specific individual correlation between the visual demands of the job and the visual qualifications of the applicant. (Job analysis for visual requirements will be discussed in the next issue of the *Industrial Hygiene Newsletter.*)

All the necessary data can be secured by ordinary and time- and space-consuming individual tests. However, in recent years, binocular testing instruments to discover visual defects and appraise visual skills have been offered to industry. These have been designed for accuracy, speed (3–5 minutes per employee), portability, and durability, and are as foolproof as possible in regards to malingering.

This battery of tests should be regarded as SCREENING TESTS. to detect substandard visual qualifications. They are *not diagnostic*! Follow-up procedures which are necessary may be briefly outlined as:

1. Employees who, on screening tests, have a high standard of performance for the specific job can be so certified to the proper placement personnel.

2. Employees who appear to have limitations of visual skills which are likely to affect their work should be referred to a competent professional person who has knowledge of the visual requirements of the various job classifications in the plant, or who is specifically informed as to the type of job for which the employee is being considered or which he holds at present.

The need for visual assistance to perform his job should be properly interpreted to the employee. In turn, the referred professional help should report to the plant medical department the examiner's findings if corrective lenses are prescribed, the vision with these lenses, whether they are to be used for distance vision, near vision, or some specific working distance, and also the approximate return for further examinations and for routine examination.

The three most commonly used screening or battery test binocular instruments

will be discussed briefly, uncritically, and in chronological order.

TELEBINOCULAR

1. Telebinocular

This instrument was developed in 1933 to screen out reading difficulties in children who might have visual problems. The telebinocular is a stereoscope, using test slides, composed of two tubular units and a sliding carrier on a shaft. A light is attached to illuminate the pictures. The lenses in the observing end consist of a pair of approximately 5.00 diopter spheres decentered to produce a prismatic effect of about an eight-prism lens outward. The shaft is calibrated in quarter diopters. Paired cards may be inserted in the carrier to test fusion sense. The carrier may be set at infinity to test muscle deviation for distance, or it may be set so that any amount of accommodation up to 3 diopters may be brought into play to determine the deviation for near.

This instrument has been used rather widely in vocational and industrial selection, and its performance has been carefully studied by the Joint Committee on Industrial Ophthalmology of the American Medical Association. ("The Keystone Telebinocular in Industry," Jour. of the Amer. Med. Assoc., vol. 123, no. 9, p. 558, October 30, 1943). On the basis of correlation of thousands of records made with this instrument in industry with actual performance on the job, with accident statistics, and with conventional professional clinical tests, the Joint Committee determined some of the limitations of the tests. An improved simplified, practical record form has been worked out by a member of the committee, whereby visual acuity tests at distance have been correlated with Snellen equivalents.

Recently an improved instrument has been designed and tests have been redesigned so that they may conform to statistical tabulation. A new near-point visual-acuity test has been added for measuring visual acuity at 16-inch working distance binocularly and also for the right and left eye individually. Hence, the instrument offers the following tests: Vertical balance at far point; lateral imbalance at far point; visual acuity right eye at far point; and visual acuity left eye at far point; depth perception at far point and color perception at far point; lateral imbalance at near point; visual acuity both eyes at near point; visual acuity right eye at near point; and visual acuity left eye at near point.

2. Ortho-Rater

The ortho-rater is a modified Brewster stereoscope provided with photographic plates (and a kodachrome slide for color discrimination) set in two drums rotated by a crank on the outside of the instrument, and not visible except through the viewing box itself. Tests in the "distance" drum are the optical equivalent of 8 meters' distance. Tests in the "near" drums are at a downward angle and at the optical equivalent of 13 inches distance from the lenses of the instrument. The acuity tests, when decoded, correspond to Snellen values. The phorias are measured in units of one prism distance and 1½-prism diopter near.

The scores which are not translatable into clinical measurements indicate ranges of normal, outside of which the danger zones of imbalance exist. Stereopsis is measured at distance only, based on various levels of difficulty. Color discrimination tests are on a sliding scale for color appreciation rather than on a hard and fast color blind rule. Thus the 12 visual skills tests are:

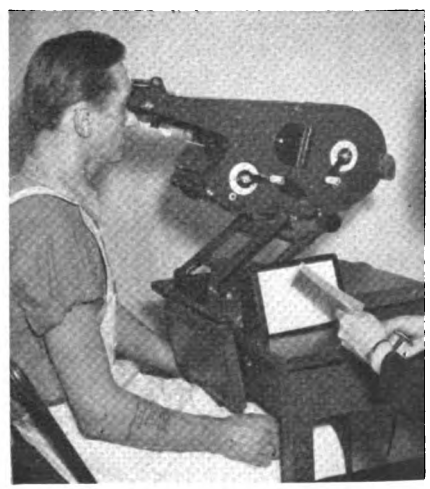
1. Far phoria vertical.
2. Far phoria lateral.
3. Far acuity both eyes.
4. Far acuity right eye.
5. Depth perception.
6. Far acuity left eye.
7. Color vision.
8. Near vision acuity both eyes.
9. Near acuity right eye.
10. Near acuity left eye.
11. Near phoria vertical.
12. Near phoria lateral.

The instrument is compact and portable and the tests can be conducted almost anywhere except where noise and confusion will interfere with the examiner's work.

The Ortho-rater has a unique method of scoring the tests which lends to very flexible classification. The test results are recorded on a combined marginal punch card and record card called a "Selectograph." The recorded data are punched in the code on the border of the card in order to permit mechanical sorting. For each visual skill tested, a space is punched or slotted according to degree. Thus, groups of individuals having the desired visual characteristics for a given type of job can be selected from a stack of cards by running a knitting needle through the punch hole representing the visual score at any given point. Cards having a slotted hole at that point are rejected by shaking them out. By means of a line drawn through the scores obtained on each visual test, a "visual performance

(*Continued on page 6*)

ORTHO-RATER

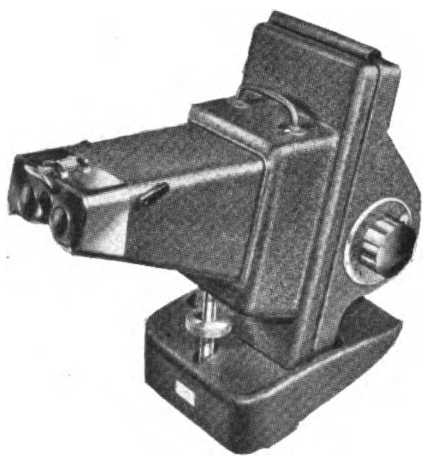


RIGHT EYES

(*Continued from page 5*)

profile" can be drawn on the face of the record chart. Such a profile of an employee's visual status can be quickly compared with a transparent "model" profile, drawn to show the acceptable and unacceptable visual scores for the particular job.

SIGHT-SCREENER



3. Sight-Screener

The Sight-Screener provides stereovectograms viewed through polaroid lenses and filters (instead of prisms for test for near). This instrument is based on a translucent target screen behind which is a standard illuminating source. The target is composed of a Vectograph transparency on which are printed the various test characters, and is mounted between two pieces of glass, the rear one being ground to provide uniform diffusion of light. The transparency and the glass plates are bound together in a "sandwich" and mounted rigidly in a metal frame. The frame is slotted and notched along its edges and geared into the control mechanism in such a way that only one array of test characters is displayed at a time. The screen is manipulated on the outside of the housing by turning a knurled knob to a number corresponding with the test characters to be read.

The testee looks into the machine with both eyes open in a natural manner. The left eye cannot see the target intended for the right eye nor can the right eye see the target intended for the left eye because of the right angle polarization through the polaroid lenses to the Vectograph characters. In the binocular test, both eyes simultaneously see similar characters used in the single images. To test for distance, one turns a lever which throws a pair of compensating lenses in front of the testee's eyes (giving the optical equivalent of 20 feet), whereby they are relaxed for distance insofar as focal power and convergence effort are concerned.

To test near-point, one flips the lens lever up which carries the compensating lenses out of the way. The near-point test is taken at an actual 14 inches with no optical system interposed between the eyes and the target. There is no septum to interfere with the convergence angle, and there are no lenses to stimulate vision by magnification or by convergence effort. A supplementary color test consisting of 10 plates is provided as an accessory to be used where color discrimination is a job requirement. Thus, the Sight Screener tests for:

1. Simultaneous binocular vision.
2. Visual acuity at far for both eyes, right and left.
3. Visual acuity at near for both eyes, right and left.
4. Depth perception.
5. Phorias lateral for distance and near.
6. Phorias vertical for distance and near.
7. Color.

With the Sight Screener, a key card is supplied to the professional man for the quantitative interpretation of the screening tests. Using these values he indicates whether or not the employee has adequate vision uncorrected, satisfactory vision with present glasses, or needs an eye examination and complete professional care. Along with the record of "Visual Capabilities" of the employee is a card depicting the "Job Visual Requirements" (subject to be discussed in next issue). Thus, matching of employee's visual capabilities with job visual requirements determines the individual occupational visual fitness.

These various screening devices try to afford accuracy and speed in determining visual aptitude and fit in rather well for the wide differences that have been found in the visual requirements demanded for maximum proficiency for various types of jobs. However, these tests should not be considered in any way or sense as equivalent to or as a substitute for accurate refraction or clinical diagnosis. They are valuable for screening and have a definite field of usefulness in industry. They must be used with a thorough knowledge of their limitations.

(A list of do's and dont's for the use of the Snellen test chart has been deleted from this article because of space, and is available in mimeographed form from the Managing Editor.)

Columbia Offers Expanded Program In Industrial Hygiene

In order to meet the growing demand for trained personnel, the Columbia University School of Public Health is developing courses of study for physicians, nurses, engineers, and chemists whose chief interest lies in the field of industrial hygiene or occupational medicine. For the academic year starting in September 1947, properly qualified students will be accepted as candidates for the degree of Master of Public Health or Master of Science in Industrial Hygiene. The curricula will include lectures, seminars, demonstrations, laboratory exercises, and field work appropriate to the needs and interests of the students.

Students working toward the master of public health degree will be required to take, in addition to their industrial hygiene work, courses in other public health subjects, such as biostatistics, epidemiology, administration, sanitary science, and health education. Those enrolled for the master of science degree will be permitted to concentrate to a greater extent on industrial hygiene subjects.

Further information may be obtained from the director, Columbia University School of Public Health, 600 West One Hundred and Sixty-eighth Street, New York 32, N. Y.

CURRENT TRENDS IN HEALTH AND WELFARE PROGRAMS

Lee Janis, M. D.—U. S. P. H. S.

I. HISTORICAL

Industrial health practitioners, as a result of last year's National Bituminous Coal Mine Wage agreement, have become acutely aware of their stake in labor-management health and welfare plans. The Council on Industrial Health, along with the Council on Medical Service, of the American Medical Association, has expressed its keen interest in the subject at meetings in San Francisco, Williamson, W. Va., Washington, and Chicago. The Journal of the American Medical Association, as well as some organs of constituent medical societies, has also expressed itself editorially on this matter.

Climax of a Trend

Although the Krug-Lewis agreement came as a surprise to many of us in industrial hygiene, actually it was not a completely new development. It was rather the culmination of a specific trend in evidence since the early days of the recent war, and of a more general movement occupying wage-earners since the early days of Greek and Roman civilization, in the pre-Christian era.

Economic security, of which health security is a vital factor, has been a goal of working people since earliest times. In the present-day United States their greatest remaining source of insecurity is sickness not related to the job. Against all the other catastrophes which threaten workers and their families—unemployment, dependent old age, death of the breadwinner, and industrial disability—some measure of protection is available, in the form of our social security and workmen's compensation laws.

Early Patterns

In this country, some of the earliest schemes designed to provide security against sickness for industrial workers were established by employers. Since they were started in industries which most needed them, such as railroading, mining and logging, where workers lived isolated from the rest of civilization, in remote and inaccessible areas, these plans were most often of the service type. That is, physicians, nurses, hospital facilities, and so on, were brought to the workers, and the benefits which workers received were professional services, rather than cash indemnities. Most of these schemes were contributory, although a few were financed entirely by the employer, as an inducement to get laborers to come to the area and to remain there.

Concomitant with this trend, employers in more populous areas, better supplied with professional personnel and facilities, were energetic in developing organizations for the financial relief of their incapacitated workers. These came to be known as sickness benefit or mutual benefit societies. The theory in this type of scheme is that the cash benefits may be used to purchase medical services, thereby providing health security indirectly.

Labor-Sponsored Plans

Finally, in addition to these two types of health and welfare plans sponsored by employers, there was a parallel growth of benefit associations under the auspices of workers themselves. These latter may be considered to be direct outgrowths of the Roman *collegia*, the medieval guilds and the European friendly societies. Much of the popularity of early trade unions was due to their having embraced this type of beneficial activity.

Conforming to the tradition of their prototypes, labor-sponsored mutual sick-benefit associations also operated on the cash indemnification principle. For groups of workmen to attempt to organize medical service plans by themselves without any outside financial assistance was, with a few noteworthy exceptions, an impossible task. As a matter of fact, even their cash sickness benefits were more often than not on a shaky actuarial basis, with the result that they steadily decreased in popularity and membership in the years before the war, giving way more and more to contributory schemes in which the risk was assumed by commercial insurance carriers. To some extent before the war, Blue Cross plans to cover hospitalization expenses, and to a much smaller extent voluntary medical service programs to cover surgical and medical expenses, received the support of industrial workers. Group insurance, however, based on cash indemnification, clearly had the edge.

This is where matters stood at the outbreak of World War II. Next month we will describe wartime developments in the field of industrial medical care, and review the type of plan most prevalent today.

No one has a "corner" on ideas. We believe industrial hygienists have found many ideas and devices to increase the efficiency of their work, or to decrease the time and energy spent in doing a job, or perhaps both. If you will share your favorite labor-saving devices or successful techniques which you have discovered useful in laboratory, office, or field we will publish them in this column. Unless you specify to the contrary, your name will be published with the article. Send your ideas, illustrated with sketch or photograph, if possible, to the Managing Editor, INDUSTRIAL HYGIENE NEWSLETTER, U. S. P. H. S., Bethesda 14, Md.

Determination of Carbon Monoxide Improved

For those investigators who use the motor-driven M. S. A. Carbon Monoxide Indicator, the following information may be of interest.

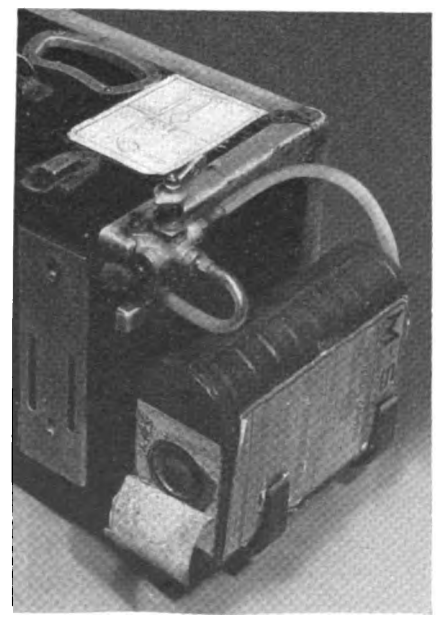
Like most field instruments on the market this one lacks provision for obtaining a zero-reading at the point of testing. The usual procedure, recommended by the manufacturer, is to run the instrument for 15–30 minutes in an atmosphere free from CO and then adjust the needle of the meter to zero. This would mean that the zero setting must be done in some remote office, and then the instrument is carried, while in operation, to the point to be tested.

Two factors involved in this procedure may cause serious errors:

First: Since the estimation of CO is based on the principle of measuring the temperature rise of combustion of CO to CO_2 with the aid of a very sensitive thermocouple, deflection of the needle will occur if the instrument is moved to an atmosphere of different temperature than that where zero was obtained.

Second: Like many instruments employing sensitive galvanometers the needle has a tendency to drift over a period of time. Thus before we modified our instrument and procedure we had the repeated experience of after having set the zero and spent a couple of hours testing for CO, when we returned to the place where we had obtained the zero, the needle would not come down to its original zero but stopped at a point indicating at some times 50 parts per million CO or more. This is especially troublesome with indicators having the sensitive scale, since the natural expectation is that the CO concentration should be accurate to within 1 scale division, or on our instrument, 5 parts per million.

In order to overcome both of the sources of error mentioned, the following modifications were undertaken, as shown on the photograph: An M. S. A. Universal canister which contains Hopcalite, and thus removes CO, was mounted on brackets on the right side of the instrument and a three-way stopcock fastened at the front right hand corner.



MODIFIED CO INDICATOR

The air inlet of the instrument was connected to the common branch of the stopcock and the top of the canister to one of the others by means of plastic tubing. A diagram showing the correct position of the valves is pasted on top of the cabinet.

In use, the instrument is taken directly to point of testing, the flap on the bottom of the canister opened, the valve turned to let the air pass through the canister and the motor started and airflow adjusted. After the instrument has warmed up, the needle is adjusted to zero and the amount of drifting observed. If the drift does not exceed 1 division in 3 minutes, the instrument is ready to use. The needle is then adjusted accurately to zero and the valve turned to a position letting the air directly into the instrument. The canisters we have been using so far have not added noticeably to the flow resistance of the air. If such a thing should happen, the flow should be adjusted after the valve is turned to test position.

If CO is present the indicator will start registering within 10 to 30 seconds, depending upon whether or not a hose

is connected to the inlet. A maximum should be reached in about 1 minute and the reading recorded. After the reading has been taken the valve should be moved to purge position and the instrument moved to the next test location where the above procedure is repeated. Using the described technique, accuracy of reading within 1 scale division is easily obtained.

An observation with regard to the use of this instrument may be of value. The correct response to CO concentration is critical to changes in rate of airflow. In our experience, if after being serviced the response to CO is sluggish, it has invariably been found to be due to dirt accumulating in the orifice of the flow meter. Periodic cleaning of orifice and the three-way valve is therefore imperative.—*A. N. Setterlind, Illinois.*

"The Money Value of a Man"—Revised

"The Money Value of a Man" by L. I. Dublin and A. J. Lotka. Revised edition. The Ronald Press Co., New York, 1946. xvii+214 pp., $6. This is a revised edition of a work first appearing in 1930. Of the 12 chapters, 7 will be found of particular interest to those engaged in industrial health activities. The titles of these chapters are: Income in Relation to Age and Economic Status; The Money Value of a Man as a Wage-Earner; The Burden of the Handicapped; Valuation of Indemnity for Personal Injury or Death; Disease and the Depreciation of the Money Value of a Man; Application to Public Health; and Social Insurance in relation to the Money Value of a Man.

In Memoriam

Miss Mary T. Dowling, executive secretary of the American Association of Industrial Nurses, died February 13, following a heart attack. Her devotion to industrial nursing is well known to many people, who will miss her leadership and inspiration. While Miss Dowling had held her office only since last September 7, she had been active in the organization since its beginning.

Dust Counting Procedures Explained

In sampling atmospheric, fibrosis producing dusts, the best quantitative index to the hazardousness of a dusty operation is the particle dust count. Samples of dust for counting can be taken with any one of several apparatus, the choice depending on the operation and the character of the study. Some instruments deposit or impinge the dust particles from the atmosphere being analyzed directly onto a glass surface, while with others the dust is trapped in a liquid of low solvency.

It is necessary, with those samples collected in a liquid, to take a homogeneous aliquot portion and place in a glass cell for counting. An interval of time is allowed for the settling of particles to the floor of the cell, and standard practice is to focus the microscope vertically through the cell to bring into focus for counting those particles still in suspension, as well as those on the floor of the counting cell. Fluid trapped particles must be counted within 24 hours because of the possibility of solvent action, conglomeration, or both.

Although the atmosphere being evaluated may contain large numbers of ultra-microscopic dust particles, the greater percentage of those sized particles of biological significance are rendered visible with the ordinary microscope, having a suitable eyepiece and objective and fitted with a condenser.

A grid, ruled on the cell floor or imposed by a disc in the microscope ocular, aids the counting and limits the field to a known area.

In the several operations of sampling and counting dust, great care is taken not to introduce extraneous dust particles. All equipment is carefully washed, using relatively dust-free materials. With all sampling, a blank is carried through the full procedure, without, however, aspirating air into or onto the sampling medium. The dust particle count on the blank will include any dust present in the microscope system. This blank count is then subtracted from the average count of the atmospheric sample and the particles per volume of analyzed air are computed.—***Engineering Section, Industrial Hygiene Division, U. S. P. H. S.***

Shipyard Study

(Continued from page 3)

arc welder's siderosis, related to the iron fumes; cardiovascular hypertonia, related to the possible nitrite effect produced by exposure to oxides of nitrogen; and welding burns or scars. The medical examination was made only once on each worker and since the period of welding exposure was relatively short, the clinical findings must be appraised with caution. Inasmuch as the medical examinations were made only of workers on duty, no cases of zinc fume fever were observed, although the histories indicated this condition to be a relatively common occurrence.

CONCLUSION—Based on the observations of this study, it may be concluded that the gases and fumes generated by welding of mild steel as practiced in U. S. Maritime Commission and certain U. S. Navy contract shipyards induces an upper respiratory symptom complex and other possibly related changes such as arc welder's siderosis and a slightly lowered blood pressure. These alterations as demonstrated statistically are of clinical importance so far as temporary disability, differential diagnosis, treatment and prognosis are concerned. The observations indicate that these changes have not led to permanent disabling residual effects. Safety measures in the form of eye and skin protection and ventilating practices have undoubtedly aided materially in keeping all industrially related clinical findings at low levels of significance.

Correction

Your attention is called to two errors in the February issue of the INDUSTRIAL HYGIENE NEWSLETTER. On page 3, column 2, the last line should read: Mechanical disc sanding was decreased through drastic reduction in the amount of lead solder used and by the substitution of hand *filing* methods wherever possible.

On page 6, column 3, in the last sentence of the Thorium article it should read: . . . the recommended value of 10^{-11} curies per liter of air for safe working conditions.

These Can Help You

This is another in the series of articles on information and education in an industrial hygiene program. The last article, which appeared in the December 1946 INDUSTRIAL HYGIENE NEWSLETTER, discussed uses for materials published by the Industrial Hygiene Division of the United States Public Health Service. Inquiries received since then reveal that nurses and physicians in industry, and in industrial hygiene divisions are unfamiliar with the many leaflets, posters, and films issued by other Divisions of the United States Public Health Service which are suitable for use with industrial workers.

We are therefore listing these materials and their prices for your information. Publications of the Industrial Hygiene Division have been omitted.

Sample copies of all Public Health Service printed or multilithed materials are available free on request to the United States Public Health Service, Washington 25, D. C. Larger supplies must be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at the prices indicated, unless otherwise noted.

PRINTED MATERIALS

FOLDERS—*Health Education Series:* Information on health problems of common interest to the adult population. Those titles in the series marked with an (*) are multilithed and are not for sale. The Public Health Service will supply five free copies on request and grant permission for reproduction provided proper credit is given.

No. 1. Sunburn and Suntan, 5 cents each, $1.50 per 100.
*No. 2. Climate and Tuberculosis.
No. 3. Hot Weather Comfort, 5 cents, each, $1.50 per 100.
No. 4. Sunstroke, Heatstroke, Heat Prostration, 5 cents each, $1.50 per 100.
No. 5. Care of the Feet, 5 cents each, $1.50 per 100.
*No. 6. Ringworm including Athlete's Foot.
No. 7. Swimming, 5 cents each, $1 per 100.
*No. 8. Poliomyelitis.
*No. 9. Chronic Arthritis.
*No. 10. Snakebite.
*No. 11. Scabies.
*No. 12. Hemorrhoids (Piles).
No. 13. Sulfa, Penicillin, 5 cents each, $1.50 per 100.
*No. 14. Leprosy.
*No. 15. Menopause.
No. 17. Hay Fever, 5 cents each, $1.50 per 100.
*No. 18. Low Blood Pressure.
No. 19. Asthma, 5 cents each, $2.75 per 100.
*No. 20. Rocky Mountain Spotted Fever.

Venereal Disease:

No. 1. Syphilis—Its Cause, Spread, Cure, $1.50 per 100.
No. 3. Protecting the Unborn Baby, $1.50 per 100.
No. 4. Wedding Plans, $1.50 per 100.
No. 5. Gonorrhea—Its Cause, Spread, Cure, $1.50 per 100.

Cancer:

No. 1. What to Know and What to Do About Cancer, 5 cents each, $1 per 100.
No. 2. Breast Cancer, 5 cents each, $2 per 100.

Tuberculosis:

No. 1. You're Going To Have Your Picture Taken—50 cents per 100.

Other Pamphlets:

Miscellaneous Publication No. 21. Until the Doctor Comes (First-Aid), 15 cents. Discount of 25 percent on orders of 100 or more.
Malaria (Folder), 5 cents each, 75 cents per 100.
So You've Had Malaria (For Servicemen), 5 cents.

Supplements to Public Health Reports:

No. 135. Common Colds, 5 cents, 25 percent discount on orders of 100 or more.
No. 149. Good Teeth, 5 cents, 25 percent discount on orders of 100 or more.
No. 161. Ivy and Sumac Poisoning, 5 cents, 25 percent discount on orders of 100 or more.

POSTERS

Cancer: Four colors, 22 x 28 inches, 5 cents each, $3.75 per 100 copies.
No. 1. Early Diagnosis Would Save 50,000 Lives Every Year.
No. 2. From 7th to 2d Place Among the Big Killers in the Last 25 Years.
No. 3. Only X-Ray, Radium, Surgery Ever Cured Cancer.
No. 4. Cancer Danger Signals.

Tuberculosis: Four colors, 10 x 14 inches, 5 cents each, $2 per 100.
No. 1. You May Look Healthy, But What Does Your Chest X-Ray Show?
No. 2. Health Wanted—Have Your Chest X-Rayed, Find TB Early.
No. 3. Have Your Picture Taken—Guard Against Tuberculosis.

Venereal Disease: Four colors, some 22 x 28 inches, some 14½ x 19 inches, 5 cents each, $3.75 per 100.
No. 7. No Home Remedy or Quack Doctor Ever Cured Syphilis or Gonorrhea.
No. 13. Know For Sure—Get a Blood Test for Syphilis.
No. 14. Make Our Men As Fit As Our Machines.
No. 15. No Home Remedy Ever Cured Gonorrhea.
No. 17. Know For Sure—Get Blood Tests Before Marriage.

MOTION PICTURES

To borrow one or more of these films send your request through your State or local health department. To purchase films, write to Surgeon General, United States Public Health Service, Washington 25, D. C., for authorization forms and price list.

Choose to Live: Sound, 16 mm., or 35 mm., 16 minutes. Black and white. Dramatic film—one woman's victory over cancer. Touches on cancer danger signals . . . diagnosis . . . X-ray, radium, and surgical treatment in modern hospitals . . . possibility of cure . . . current scientific research at the National Institute of Health.

Enemy X: Sound, 16 mm., 14 minutes. Black and white. Semidramatic film, detective story opening, with cancer as the mysterious killer . . . symptoms of the disease . . . importance of early diagnosis . . . work of the Woman's Field Army. (Produced in cooperation with American Society for the Control of Cancer.)

Fight Syphilis: Sound, 16 mm., 10 or 20 minutes. Black and white. Expository film—how to combat syphilis. For adult mixed audiences. Ten-minute version emphasizes the individual's role . . . blood tests . . . avoiding exposure . . . proper treatment . . . the danger of quacks. Also in 35 mm. Twenty-minute version includes the community's job . . . education . . . providing clinics, follow-up workers . . . the drain on the Nation's manpower . . . cost of supporting the blind, the insane, the unemployables crippled by syphilis.

Help Wanted: Sound, 16 mm., 26 minutes. Black and white. General presentation of the basic principles of

first aid . . . the circulatory system . . . improvised tourniquets . . . use of bandages . . . treatment of shock . . . burns . . . artificial respiration . . . splints. (Produced by Johnson & Johnson in cooperation with the United States Public Health Service).

Know For Sure: Sound, 16 mm. or 35 mm., 22 minutes. Black and white. Produced in Hollywood by Darryl Zanuck, directed by Lewis Milestone. *Original version:* Suitable for male audiences only. Dramatic film—a physician's experiences with syphilis. Sources of infection . . . early symptoms . . . diagnosis . . . clinical treatment . . . prevention . . . quacks. *Revised version:* Suitable for showing to mixed audiences and for instruction of high-school students. Identical with original version except section on prophylaxis and sequences showing male sex organs omitted.

On Your Feet: Sound, 16 mm., 10 minutes. Black and white. Expository film—the tire shortage forces people to walk more . . . good posture . . . properly fitted shoes . . . how to walk correctly . . . knees flexed, toes straight ahead. Military drill shown as an example. (Produced by the Melville Shoe Corp. in cooperation with the U. S. Public Health Service.)

Message to Women: Sound, 16 mm., color. Specifically for organizations of women and older teen-age groups . . . gives facts about syphilis and gonorrhea . . . shows animated charts illustrating effects of these diseases in women . . . points up the necessity for understanding and knowledge of the diseases.

To the People of the United States: Sound, 16 mm. or 35 mm., 24 minutes. Black and white. Expository and semi-dramatic film on venereal disease starring Jean Hersholt . . . contains direct appeal for individual blood tests and urges public discussion of the problem. (Produced by California Department of Public Health in cooperation with the U. S. Public Health Service.)

TRANSCRIBED RADIO PROGRAMS

The transcriptions are on 16-inch diameter disks, cut at the standard radio speed of 33⅓ r. p. m. They cannot be played on an ordinary phonograph. Requests for loans should be sent to the United States Public Health Service, Washington 25, D. C. The transcriptions may be purchased at approximately $1.25 per record. Instructions for placing a purchase order will be sent upon request. The programs range from 13½ to 15 minutes in length.

"The Unseen Enemy" Series

George Henry's Heart: Syphilis, 20 years old, creeps up on a likable crane operator in an aircraft plant . . . an airplane engine falls . . . as George Henry lies dying, he reviews his past memories.

The Case of Torchy Allen: A soldier contracts gonorrhea from a night-club singer . . . health department investigators follow her trail across the country . . . she is found, brought under treatment.

The Escape of Torchy Allen: Torchy runs away from the venereal disease rapid treatment hospital . . . meets a sailor . . . is beset by fear she will infect him, or some day become a cripple herself . . . returns to the hospital.

The Return of Torchy Allen: Cured, Torchy goes back to night-club singing . . . counsels a girl friend . . . defeats a blackmailer who threatens to publicize her hospital stay.

When the Killer Quits: An escaping bank-robber, shot in the shoulder, bursts in on an aged small-town physician . . . compels medical attention at gun point . . . the doctor tells him he has syphilis . . . that he may die blind, or a cripple, or in a straight jacket.

Headline Revenge: A scandal-sheet newspaper reporter tries to find out if the mayor has syphilis . . . is rebuffed by the health department . . . by the mayor's physician . . . finally gives up.

Cancer

Light on the Great Darkness: A physician explains the nature of cancer . . . early diagnosis . . . X-ray treatment, radium, and surgery . . . work of the National Cancer Institute and the Women's Field Army.

Six Signs of Danger: Dramatic program . . . a man tries to ignore serious symptoms . . . comes under a doctor's care just in time . . . what to do when the six most common symptoms of the disease appear.

Miscellaneous

A Day in the Life of a Dentist: A dentist ironically recounts his experiences . . . why people neglect their teeth . . . how to keep teeth healthy.

Play Safe: A physician's dramatized lecture on vacation hazards . . . sunburn, poison ivy, insect bites, drowning, forest fires.

Venereal Disease

Our Town is Your Town: Interview with Dr. Vonderlehr, former chief of the Venereal Disease Division, United States Public Health Service . . . nine points in a good community program for controlling syphilis . . . operation of trailer clinics in rural Georgia.

Shadow on the House: Dramatic program, flashback technique . . . A lonely father finds his runaway son in jail, serving an unmerited prison sentence . . . the boy is being treated for syphilis . . . he refuses a pardon because his home town lacks treatment facilities.

Some of Your Business: Narrator, with dramatic inserts . . . economic losses due to syphilis . . . prenatal and premarital examination laws . . . an employer, insane with paresis, wrecks his firm.

Story of a Young Man: Dramatic program . . . a young man with syphilis goes to a quack . . . gets worse . . . is rescued by his family physician, who explains that syphilis should be dealt with openly.

Story of Your Town: Dramatic program . . . venereal disease sweeps through a typical boom town . . . the threat to soldiers, war workers . . . how local, State and Federal agencies combine to stem the epidemic.

There Ought to be a Law: Round-table report by a small Connecticut family . . . why their State law requires blood tests before marriage . . . how the congenital syphilis rate was cut 50 percent in 5 years.

This is My Son: Dramatic program . . . an expectant mother discovers she has syphilis . . . takes treatment in time . . . bears a healthy child . . . the argument for prenatal blood tests.

WANT TO EXCHANGE PUBLICATIONS?

Exchanging official publications with other State and city industrial hygiene units is a good way to get ideas. Here is a list, complete as we can get, of the State and city periodicals that publish industrial hygiene information. Write and offer to send your State or city publications in exchange for the others. For addresses, consult the personnel directory compiled by the Industrial Hygiene Division, U. S. P. H. S.

Arkansas.—***Arkansas Health Bulletin.***

California.—***California's Health; California Safety News.***

Connecticut.—***Connecticut Health Bulletin.***

Georgia.—***Georgia's Health.***

Illinois.—***What's New In Industrial Hygiene; Health Messenger.***

Indiana.—***Monthly Bulletin.***

Iowa.—***Industrial Nurses; News and Notes.***

Kansas.—***Jayhawk News of Industrial Nurses.***

Maryland.—***Maryland State Department of Health.***

Baltimore.—***Baltimore Health News.***

Michigan.—***Michigan Labor and Industry.***

(*Continued on page 14*)

STATE AND LOCAL NEWS

CONNECTICUT

Cadmium Soldering—An operation in which parts were soldered together with cadmium was investigated. The work was conducted in a small booth 2 feet square at the front opening and 2 feet deep. As the booth was exhausted from the top, and the operator had to put his head into the booth to see what he was doing, fumes were being drawn up through his breathing zone. Provision of a deeper booth, exhausted from the rear, and with a large mirror making it possible to watch the operation from the outside, afforded protection for the worker.

Graduate Course—The Yale Institute of Occupational Medicine and Hygiene sponsored a postgraduate course in industrial medicine February 4–April 8, 1947. The 10 sessions, held Tuesday afternoons at the Yale University School of Medicine, were open without charge to physicians and to a limited number of medical and graduate students. Among subjects discussed by leaders in the field were toxicological problems, modern concept of industrial hygiene, dermatoses, hand injuries, compensation law, industrial relations, dusts, vision, radioactivity, and rehabilitation. The course was aided in part by a grant from the Liberty Mutual Insurance Co., Boston, Mass.

INDIANA

Health Conference—Indiana's third industrial health conference will be held April 16 in Indianapolis. Sponsoring the conference are the Division of Industrial Hygiene, Indiana State Board of Health; the Department of Public Health, Indiana University School of Medicine; and the Committee on Industrial Health, Indiana State Medical Society. Among the out-of-State speakers are Dr. L. F. Weber from the University of Illinois College of Medicine who will speak on "Industrial Dermatosis"; Dr. Lawrence Fairhall, U. S. P. H. S., whose subject is "Toxicology of Heavy Metals"; and Dr. Anna Baetjer, Johns Hopkins University, speaking on "Control of Upper Respiratory Diseases."

KANSAS

Personnel—Dr. R. M. Heilman, formerly Director of the Division of Industrial Hygiene, has resigned to accept a residency in Internal Medicine at the Winter Veterans' Hospital, Topeka, Kans.

LOUISIANA

Lectures and Courses—During the year, Warren H. Reinhart, Acting Chief, Industrial Hygiene Section, gave industrial hygiene lectures to the senior dental students at Loyola University of the South and to the senior engineering students at Tulane University.

The State Health Department recently established a Training Center for public health personnel. Industrial hygiene lectures are given to each class of trainees.

MASSACHUSETTS

Health Services—The Division is cooperating with the Quincy Chamber of Commerce in promoting a campaign to provide health services to workers in the south metropolitan area. A committee composed of officials of the Quincy Chamber of Commerce, the Massachusetts Department of Labor and Industries, the Massachusetts Department of Public Health, the Norfolk County Medical Association, and the Quincy Board of Health has been organized. A survey is being made by the Division of Occupational Hygiene of the health facilities now available to workers in that area.

Smoke Program—Members of the staff have conferred with officials from cities and towns in the southern Connecticut Valley district for the purpose of formulating a program to eliminate dust and smoke nuisances in that area.

MINNESOTA

Personnel—Miss Genevieve Anderson has been appointed to succeed Miss Heide Henriksen as Industrial Nursing Consultant. Miss Anderson has been with the Territory of Hawaii's Board of Health.

NEW HAMPSHIRE

Tire Recapping—In cooperation with the Bureau of Labor, this Division has completed a survey of tire recapping stations. The principal hazards encountered were excessive exposures to benzol and toluol used in the rubber cements, and numerous fire hazards. The latter consisted in the lack of forced draft ventilation to remove solvent vapors liberated upon application and drying of the cements, the absence of explosion-proof electrical equipment, and the presence of faulty wiring.

Dust from the buffing wheels was found to be a serious fire hazard, and the need for proper exhaust ventilation and fire prevention measures was clearly demonstrated.

Pepper in the Bag—Employees in a cellulose flock plant were complaining of eye and nose irritations. A visit to the plant revealed that complaints occurred during the periods when the plant was processing hardwood sawdust. Even then, it was only occasionally that the symptoms appeared, apparently due to various shipments of the sawdust which were obtained from a woodworking plant in another part of the State.

A visit to the latter plant uncovered the fact that the sawdust was a byproduct from birch, maple, and oak woods. There was no contamination with glues, resins, or similar substances. However, on observation of the bagging process it was found that the bags being used were highly contaminated with pepper, and discontinuance of these reused bags solved the problem.

NEW JERSEY

New Bulletin—"Medical Administration" is the fourth in a series of industrial health bulletins written and distributed by the New Jersey Division of

Industrial Health. In its 11 pages is a condensed discussion of the total-man concept of industrial medicine, the value of an industrial health program to industry and, the functions of an industrial medical department and its relations with the management, employees, and community.

NEW YORK

Compressed Air Illness—Interest in this subject has been highlighted by the building of the Brooklyn-Battery tunnel in which a certain amount of the work is being done under compressed air.

One of our primary interests is the matter of preventing bone necrosis, cases of which may apparently develop and cause disability years after exposure to compressed air has ceased. Such cases from the mid-town tunnel, for example, are now coming up for compensation.

Both the "bends" and the bone necrosis are the result of the release of nitrogen bubbles into the blood stream in the course of decompression. Recognition of bone necrosis, however, as an aftermath of exposure to compressed air—even possibly developing in the absence of "bends," insofar as can be determined—has seriously altered the outlook on prevention. The need for revision of the compressed air code in New York State has come acutely to the fore.

Three medical officers from the U. S. Naval Research Center, Bethesda, Md., were invited to attend a recent conference to discuss these problems in the light of their research work with divers in the Navy. At this conference, differences in decompression time permitted by the New York State compressed air code were compared with the somewhat different schedule employed by the Navy.

After attending this conference, arrangements were made with the Tunnel Authority to take the naval officers through the tunnel and to show them the decompression and recompression techniques employed there, the medical office and medical records, etc. A report will soon be forthcoming presenting their views of the techniques and procedures with recommendations for improvement based on Navy experience and their research work with compressed air illness.

OREGON

Union Contracts for Medical Service—A labor union covering several thousand food-plant workers has incorporated in its proposed 1947 work contracts a clause providing for adequate inplant medical service and prework examinations.

Industrial Health Program in Schools—A study plan for industrial health education in Portland city schools has been approved by the curricula committee and authorized for publication. Eight industrial groups were discussed in this unity study plan, and each was illustrated with slides as part of the visual educational material. Various industries, the State Accident Commission, and others, have assisted in obtaining desirable pictures to show the health problems and their solution in these industries.

Vision-Protection Program—Work continues on the vision screening and protection program at Benson High School. The plus sphere lenses have now been used on about 200 students, and several hyperopic students have been discovered. The school authorities have decided to require protective goggles in the shops as part of the school equipment.

Plans for the development of a visual capacity analysis in correlation with shop and scholastic abilities are proceeding. The City Health Department plans to incorporate the statistical facilities of the Industrial Psychological department of Purdue University with Bausch & Lomb furnished equipment as the first study of its kind to be made in United States schools designed to establish some correlation of visual capacities with shop training.

PENNSYLVANIA

Camera Equipment—A fixed focus constant intensity lighting adapter is being constructed for the Bureau's Leica camera under the direction of Dr. E. R. Aston, dental consultant. By means of this apparatus it will be possible to expose close-up 35-millimeter color transparencies of the oral cavity, depicting oral diseases of occupational origin. It is expected that a complete file of pictures of such cases will be accumulated for use in lecture and educational work.

A similar apparatus has been used successfully for some time by the Thomas W. Evans School of Dentistry at the University of Pennsylvania.

Personnel—Two registered X-ray technicians, Miss Mary K. Smith and Miss Virginia M. Bello, have been added to the staff recently.

UTAH

Miners' Meeting.—An illustrated lecture on occupational disease hazards of open-pit mining of limestone and dolomite was presented by this division to 35 members of the Payson local miners' union. The program included a sound movie and a display of sampling instruments.

University Training—A cooperative plan is in effect with the University of Utah School of Medicine to instruct senior medical students in the detection and prevention of occupational diseases. Lectures are given to the entire class, followed by group demonstrations of laboratory facilities. Later individually selected students receive approximately 4 hours of instruction in the industrial hygiene phrase of public health medicine. The purpose is to acquaint them with services and facilities available to physicians throughout the State.

Manganese Mine—Seven local manganese mines are back in production due to the demand for steel production a the Geneva Steel Co., near Provo. close check of dust concentrations being made in these mines. Manganes ore is being mined as pyrolusite—MnO It is high grade ore and is being us directly in steel production without pro essing. This survey is being made the Industrial Hygiene Division and t deputy metal mine inspector of t Industrial Commission.

WASHINGTON

Personnel Training—Drawing to close are two courses given by person of the industrial and adult hygiene s tion at the University of Washingt In the School of Public Health a Preventive Medicine a course, under title "Industrial Hygiene and Toxi

STATE NEWS

(*Continued from page 13*)

ogy," has been presented by Dr. Lloyd M. Farner, head of this section, and C. D. Yaffe, chief industrial hygiene engineer, to nursing students, representatives of management and labor, and two new members of the industrial hygiene staff. "Principles and Techniques of Industrial Nursing" is the title of the course being presented in the School of Nursing by Miss Gladys A. Jahncke, industrial advisory nurse. This class is attended by graduate nurses with experience in industrial nursing and by students either majoring in public health or interested in the special field of industrial nursing. Each course consists of a series of 22 lectures to be given over an 11-week quarter.

Spray Insecticide—The Section recently assisted on a health problem involving the use of a new spray insecticide, hexaethyl tetraphosphate, in the orchard industry of Washington. Despite the fact that this product is labeled by manufacturers as to its toxic nature, it was discovered that experimental use had been made of a solution of hexaethyl tetraphosphate in the control of insect pests in nurseries and orchards, and as a result, widespread use in the coming season was being planned in order to combat red spiders and aphids, which are unaffected by DDT. Investigation showed that the method of application has been by the conventional type nozzle spray or by the new fog-type spray and in one case was spread by airplane.

In the latter instance, it was reported that spray drifted to a neighboring property, resulting in destruction of some chickens whose food became contaminated with hexaethyl tetraphosphate. Typical of complaints by workers applying the spray were reports that they experienced shortness of breath or tightness in the chest.

Because of the above reports and limited knowledge of how the material may affect humans, arrangements were made to restrict the sale of hexaethyl tetraphosphate until reliable information is available as to whether the material may be used safely.

—?—

DO YOU KNOW—that 38 units gave 26,193 services to 19,752 plants employing approximately 4,675,000 workers, during 1945–46 fiscal period?

WISCONSIN

"Industrial Nursing—A Guide for Management and Nursing Personnel" is the title of the booklet recently prepared by the Wisconsin unit in cooperation with the executive committee of the industrial nurses section of the Wisconsin State Nurses Association. The contents of the Guide were approved by the board of directors of the Wisconsin State Nurses Association, the Industrial Health Committee of the Wisconsin State Medical Society, and the Wisconsin Industrial Relations Association.

The primary purpose of this Guide is to give practical assistance to all those concerned with industrial nursing especially in Wisconsin. It should be useful to:

1. Representatives of management and industrial physicians when establishing or improving industrial nursing services.
2. Representatives of management and industrial physicians when selecting nurses for industrial nursing positions.
3. Industrial nurses wishing to extend and improve the nursing service they render.
4. Nurses who may be considering entering the specialized field of industiral nursing.
5. Placement service workers and others when counseling with nurses seeking or interested in industrial nursing positions.
6. Curricula committees of universities in planning for courses of instruction in industrial nursing.

Copies of the pamphlet are available at the industrial hygiene unit in Madison.

Standing Orders for Nurses.—The industrial health committee of the Wisconsin State Medical Society is at present working on a new set of standing orders for nurses in industry. The completed project will serve as a guide to medical and nursing personnel in Wisconsin industries in working out specific orders, procedures and policies for use in their particular plants. A similar guide worked out by the State medical society in 1941 has proved to be most helpful to physicians and nurses in the State, but it was felt that the material should now be more detailed and brought up to date.

TEXAS

District Offices—The Texas State Department of Health has opened two new district industrial hygiene offices. Mr. W. T. Ballard, with headquarters at Tyler, is serving the east Texas area. Mr. Sam R. Venable, located in Houston, serves the coastal area. Mr. D. B. Knudson of Fort Worth is in charge of the north Texas area and Mr. George R. Gaenslen, who is in San Antonio, serves south Texas. A vacancy exists in the west Texas area.

STATE PUBLICATIONS

(*Continued from page 11*)

Minnesota.—***Nursing in Industry; Minnesota's Health.***

Missouri.—***Industrial Health Bulletin.***

St. Louis.—***Industrial Health Review.***

Montana.—***Montana Round-Up of Industrial Health Briefs.***

Nebraska.—***Better Health.***

New Jersey.—***Industrial Health Bulletin.***

New York.—***Industrial Bulletin ($1.00 a year); Monthly Review (Ind. Hygiene Div.).***

North Carolina.—***North Carolina Health Bulletin; Industrial Lights.***

Oklahoma.—***Oklahoma Health Bulletin.***

Oregon.—***Oregon Health Bulletin; Safer Oregon.***

Pennsylvania.—***Pennsylvania's Health.***

Texas.—***Texas Journal of Public Health.***

Utah.—***Your Health.***

Virginia.—***Health Bulletin.***

Washington.—***Health Commentator.***

(This list is incomplete. If States having publications not listed here will notify the Managing Editor, a supplementary list will be printed in a subsequent issue.)

NOTICE

Any material printed herein may be reprinted or republished without further request. Acknowledgment and tear sheets would be appreciated.—Editorial Board.

DO YOU KNOW?

Many inquiries for information are received by the Industrial Hygiene Division, U. S. P. H. S. When a question of general interest or one of unusual import is asked the answer will be printed here. Questionson any phase of industrial hygiene are welcome.

Q. How long has the United States Public Health Service been concerned with industrial hygiene work?

A. There has been an Industrial Hygiene Division in the U. S. P. H. S. since 1914—first as a branch of the Scientific Research Division and now as a Division of the Bureau of State Services. This Division has two major objectives intended toward the betterment of worker health. First, through field and laboratory research we aim to develop methods for the protection of the health of workers, and through such methods to bring to them positive health and complete physical and mental fitness. Second, an equally important objective of the Division is the promotion of the adoption and practice of health standards developed by us by those concerned with this problem, that is, industry, labor, and official and nonofficial agencies.

During the past decade, this Division has been particularly active in assisting the States to develop their own industrial hygiene services. Consultation with this office on technical and administrative problems is always available. In addition to financial assistance from the Federal Government, the States often receive the loan of technical personnel until the work can be carried on by State personnel. State industrial hygiene divisions have the entire resources of this Division behind them and are constantly calling upon us to assist them with problems which for the moment they are not equipped to handle by themselves.

DO YOU KNOW—that 4 territories, the District of Columbia, 1 county, 8 cities and 47 States have programs or are planning programs to protect the health of industrial workers?

QUESTION AND ANSWER

Q. What harmful physiological effects will occur from the exposure of industrial workers to ultrasonic (supersonic) waves?

A. Ultrasonic waves are waves of "sound" of frequencies above those capable of being perceived by the human hearing mechanism. Industrially, they occur in the testing of certain high speed motors, and possibly in other places where sound waves are produced.

Ultrasonic waves have been shown, experimentally, to cause physiologic and pathologic changes in animals. The nature of the damage has shown wide variation depending upon what organs the waves have had their greatest intensity. At the present time it is believed that the damage is due to the evolution of gas in the tissue (and possibly high heat production) and its resultant tissue destruction. It is questioned, however, if cases of human damage have occurred.

To prevent damage from ultrasonic waves, the best means are distance from the wave source as well as the interposition of a solid wall between the wave source and the potentially exposed workers. These safety methods are based on two factors. In the first instance, the transmission of the waves through the air decreases as the square of the distance from the source. In the second place, the transmission of the waves from the source to the air and from the air to a second medium results, in each instance, in a loss of intensity of about 99 percent. There are other mechanisms which may play a part in these control measures, but they are of less importance.

DO YOU KNOW—that 60 jurisdictions budgeted funds for industrial hygiene work totaling $2,195,128 for 1946–47? Of this sum, 35.6 percent is State money, 4.5 percent local, and 59.9 percent Federal. Total Federal funds, including those earmarked for industrial hygiene, budgeted for 1946–47, are $1,315,901.

Can You Define Industrial Hygiene?

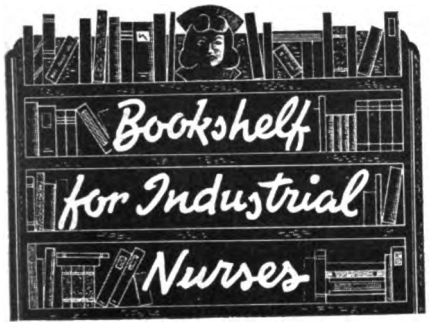
Ask a dozen industrial physicians, engineers, chemists, dentists and nurses to define industrial hygiene. You will get 12 answers.

When the Industrial Hygiene Division, U. S. P. H. S., was asked to submit a definition, a committee was finally appointed and here is the result:

Industrial Hygiene is the art and science of the preservation and improvement of the health and comfort of workers. It therefore involves primarily a program of health conservation, and accident and occupational disease prevention. Such a program necessarily extends beyond prevention of accidents and occupational diseases; it includes also the broad subject of the health of the worker. It is obvious that some of the problems arise from the nature of the industrial environment itself—namely, the control of poisonous dusts, excessive temperatures and humidities, defective lighting, noise, overcrowding, and general plant sanitation. These problems also involve such factors as hours of work, fatigue, communicable diseases in the factory, mental health, and personal hygiene. An industrial hygiene program thus necessitates the cooperation of a number of professional personnel including the physician, engineer, chemist, statistician, nurse, and dentist.

DO YOU KNOW—how many persons are employed on governmental industrial hygiene staffs? On July 1, 1947, Federal (U. S. P. H. S.), State, local and territorial industrial hygiene personnel were classified as follows:

Physicians	
Engineers	
Chemists	
Industrial hygienists	
Nurses	
Dentists	
Sanitarians, inspectors	
Lab, X-ray technicians	
Statisticians	
Miscellaneous	
Total	



QUALIFICATIONS OF AN INDUSTRIAL NURSE—This pamphlet was prepared by the American Association of Industrial Nurses, Inc., in response to a request from the National Association of Manufacturers, and is intended to be used by its membership as a guide in selecting nursing personnel. The qualifications outlined include personal, professional, and experience requirements, and are followed by an explanation of abilities and skills needed.

To get the pamphlet write to the National Association of Manufacturers, Industrial Relations Department, 14 West Forty-ninth Street, New York 20, N. Y.

INDUSTRIAL OPHTHALMOLOGY, *H. S. Kuhn*—In this textbook the industrial physician, supervising nurse, and nurse working alone will find a discussion of a recommended eye program for industry. It is a valuable reference book for teaching nursing personnel, as it exolains the various jobs which require special visual skills and emphasizes the need for such knowledge as a guide to proper placement. The means by which employees' vision can be improved for the particular job is well covered. Emphasis is placed on the functions of the industrial ophthalmologist and his responsibilities to industry. A glossary on toxic hazards is included.—The C. V. Mosley Co., St. Louis, 1944.

VENEREAL DISEASE CONTROL PROGRAM IN INDUSTRY—Recommendations to State and local health departments. Report of the Advisory Committee on the Control of Venereal Disease in Industry to the U. S. Public Health Service, August 10, 1942.

While the first half of this reprint is directed more specifically to the State and local health departments, it will also be of value to the industrial nurse. Suggestions for the education program and the follow-up procedure, and definnite recommendations regarding desirable employment policies are made.

INDUSTRIAL NURSING AND MASS RADIOGRAPHY, *Julie E. Miale*—This monograph contains much valuable reference material for the industrial nurse. The four cardinal principles mentioned apply equally well to the establishment of any health program in industry. Detailed suggestions are made to guide the nurse in stimulating the interest of management, the plant physician, and labor in the tuberculosis control program. Suggestions are made also for each step in the planning of the program, the procedures during the taking of the X-rays, and finally for the follow-up, which is essential if the program is to have lasting value. Again the suggestions will be equally helpful to the nurses who are planning and developing other programs. The appendix includes a list of selected references.—National Tuberculosis Association, New York, 1945.

OCCUPATIONAL HAZARDS AND DIAGNOSTIC SIGNS—This pamphlet consists of four sections: Alphabetical List of Occupations; List of Hazards, Symptoms, and Occupations which offer such exposures (this is the main section, and contains 128 potentially hazardous exposures); Discussion on Dermatoses; Bibliography of References on Industrial Hygiene.

It is an excellent reference when the nurse has become familiar with the use of both the table of contents and the alphabetical list of occupations.

U. S. Department of Labor, Division of Labor Standards Bulletin No. 41, 1942 revision, 70 pages. For sale by Superintendent of Documents, Washington, D. C. Price 5 cents.

These books are suggested as basic tools for all industrial nurses. Others should be added that will enrich the nurses' viewpoint in relation to the specific type of industry with which she is associated. Further suggestions will be made from time to time. Contributions from nurses in the field are welcome.

Tennessee Nurses' Programs Popular

Industrial nurses in Tennessee are experiencing a postwar revival of interest and enthusiasm for the monthly meetings of their professional organization. Stimulated by worthwhile programs, planned well in advance of the meeting dates, old and new members have proved their interest by steady attendance.

Five active groups with an average membership of around 28 each have been organized in Tennessee. While the seven districts of the Tennessee State Nurses' Association are the basis for the grouping, districts 3 and 7 have combined in the central Tennessee group and district 6 has practically no industrial nurses. In district 5, northeastern Tennessee, the industrial and public health nurses meet jointly.

Some of the more popular subjects covered by special guest speakers and group discussion are: Rehabilitation of Veterans, Teamwork in Industry, Cancer Control, Tuberculosis Control, Nutrition, Industrial Engineering and Safety, and Dental Hygiene.

One of the major efforts of the State organization, as well as of the local groups, has been centered on more effective coordination of the work of the industrial nurses with that of the public health nurses in Tennessee. Through their monthly meetings, practical advice and help have been given the industrial nurses on how to utilize their local community facilities to the best advantage of all concerned.

Bulletin on Textile Mills

A guide to good working conditions in Australian textile mills was compiled and distributed by the Industrial Welfare Division, Department of Labor and National Service, in the Commonwealth of Australia, for the benefit of one of the oldest and largest industries in Australia.

The bulletin offers comprehensive description of textile mills that provide a healthy atmosphere in which to work and excellent welfare provisions. Chapters on atmospheric conditions, working areas and working arrangements offer in scientific detail information for achieving healthful working conditions.

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