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Officers and Committees for A. C. G. I. H. for 1948

Officers and Executive Committee members for the American Conference of Governmental Industrial Hygienists named at the annual meeting in Buffalo, N. Y., April 26 to May 2, were as follows:

Dr. Louis W. Spolyar, *Indiana*, Chairman.
Mr. H. G. Dyktor, *Cleveland, Ohio*, Chairman-Elect.
Mr. J. J. Bloomfield, *U. S. P. H. S.*, Secretary-treasurer.
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Mr. F. J. Vintinner, *New Hampshire*, Executive Committee.
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Standing committee members for the new year are:

Recruitment and Training of Industrial Hygiene Personnel

Dr. L. M. Farner, *Washington*, Chairman.
Dr. L. M. Petrie, *Georgia*.
Dr. K. E. Markuson, *Michigan*.
Mr. K. M. Morse, *Illinois*.
Miss E. M. Smith, *Columbia University, New York*.

Industrial Hygiene Codes

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Threshold Limits

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Mr. A. M. Setterlind, *Illinois*.
Dr. W. G. Fredrick, *Detroit, Mich.*
Dr. Leonard Greenburg, *New York*.
Dr. H. Elkins, *Massachusetts*.

Appraisal and Reporting of Industrial Hygiene Activities

Miss V. M. Trasko, *U. S. P. H. S.*, Chairman.
Dr. L. M. Farner, *Washington*.
Mr. R. M. Brown, *St. Louis, Mo.*
Mr. W. L. Wilson, *Cleveland, Ohio*.
Miss J. Y. Ziano, *Illinois*.

Worker Health Information

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Miss Catherine Chambers, *Wisconsin*.
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Standard Method

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Mr. A. N. Setterlind, *Illinois*.

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Dr. A. V. Nasatir, *Los Angeles, Calif.*
Mr. M. F. Trice, *Tennessee*.
Miss F. R. Kahl, *U. S. P. H. S.*

The Executive Committee has appointed two new standing committees to carry on the objectives of the conference. The membership of these committees is as follows:

Standardization of Air Sampling Instruments

Mr. A. N. Setterlind, *Illinois*, Chairman.
Mr. D. A. Holaday, *U. S. P. H. S.*
Mr. F. J. Vintinner, *New Hampshire*.
Mr. H. E. Bumsted, *Ohio*.
Mr. A. Coleman, *Connecticut*.

Standardization of Plant Records and Reports

Dr. L. M. Petrie, *Georgia*, Chairman.
Dr. L. W. Spolyar, *Indiana*.
Miss V. M. Trasko, *U. S. P. H. S.*
Miss J. Y. Ziano, *Illinois*.
Mr. K. M. Morse, *Illinois*.

NEWSLETTER REMINISCENCES

June is the first anniversary of the printed **INDUSTRIAL HYGIENE NEWSLETTER**, an occasion for recalling its birth as a monthly publication in December 1940, when the first mimeographed issue was distributed.

For 3 years at the annual meetings of the National (now American) Conference of Governmental Industrial Hygienists the members discussed the need for a periodical in which the State units of industrial hygiene might interchange information on their activities.

During the spring meeting of 1940, Dr. Carl Nau of Texas, who was chairman of the Committee on Industrial Hygiene Education, said: "Maybe we could get some new ideas on this subject if we could read what some of the rest of you are doing in your respective States. I had to come up to Connecticut to find out that they were doing something on dental laboratories. . . . We should have some sort of a clearing house where such information could be passed on. It would be very useful."

Dr. A. S. Gray, director of the Bureau of Industrial Hygiene in Connecticut, said this of Dr. Nau's proposal: "Such a publication seems extremely important to me. The individual States cannot take care of it, and therefore I think we should ask the Public Health Service to do it. The publication need not be very long, but it should give brief summaries of what we are doing and any new ideas suggested for the work we are undertaking." A motion to that effect was made and passed by the conference.

War Hurdles

To continue the **NEWSLETTER** during the war years, the Industrial Hygiene Division of the U. S. P. H. S. was often taxed beyond its personnel and time capacity. Because the industrial hygienists in the field wanted the information, a real effort was made to "keep it coming." Paper conservation measures held the circulation stationary so that by the end of the war several thousand names had accumulated, waiting to be placed on the mailing list.

The increase in demand for the publication indicated a need for it other than in the State units of industrial hygiene. Physicians and nurses serving in industries during the war wanted to keep up with the development of industrial hygiene among governmental units in the United States. Employers and employees in industry asked for information about the service available to them from both the State units and the U. S. P. H. S. Educators in medical and engineering fields, vocational directors in public schools, administrators of insurance companies, and many other people were interested in receiving the **INDUSTRIAL HYGIENE NEWSLETTER**.

Into Print

With a wider service imminent, the publication changed from a multilithed to a printed periodical which made it possible to increase the amount of news and to add pertinent illustrations. In the past year, due partially to the growth of industrial hygiene services offered in the States, the circulation of the **NEWSLETTER** has almost doubled. The number of copies which can be distributed free is limited by the Bureau of the Budget and that limit is nearly reached.

Because the potential mailing list could run into many thousands, entailing more money than the Industrial Hygiene Division is entitled to spend on such a publication, it has been made available by subscription from the Superintendent of Documents, Government Printing Office, Washington, D. C. The people who have a legitimate right to receive free copies, that is, those who are employed by the Federal, State, or municipal governments in public health projects, will continue on the official mailing list.

On Subscription Basis

In order to continue introducing the **INDUSTRIAL HYGIENE NEWSLETTER** to industrialists, labor leaders, physicians, dentists, nurses, engineers, educators, and others who are interested in industrial health problems, complimentary copies will be sent upon request for a brief period. After that time they will be asked to send the fee of \$1 (\$1.25 outside the United States) for a year's subscription to the Superintendent of

Documents. To make it fair for everyone, the people who have been on the free mailing list the longest will receive within the next few months a notice that if they wish to continue to receive the publication they will have to place their subscription with the Superintendent of Documents. As fast as names can be withdrawn from the free list those copies will be available for complimentary mailing to others who are not acquainted with the **NEWSLETTER**.

A Heart to Heart Talk With the States

The following editorial is reprinted from the April 1941 issue of the **INDUSTRIAL HYGIENE NEWSLETTER** to remind the States that this publication is still theirs—a medium for the interchange of news among State Industrial Hygiene Divisions:

"Alas, this issue of 'Industrial Hygiene' contains little news from the States. It is not because the State industrial hygiene units are not doing anything worth reporting. It is because not enough of these units are telling us about their problems and their activities.

"State industrial hygienists will recall that 'Industrial Hygiene' was started because they had expressed a need for an organ which would serve as a medium for the interchange of experiences between the various units. Texas wanted up-to-the-minute information on Connecticut's activities, and vice versa. New Hampshire was perplexed as to how to solve a particular problem. Utah had developed a very successful technique for solving that very problem. New ideas recommended by practical industrial hygienists were desired by other practical industrial hygienists.

"We believe that 'Industrial Hygiene' can be made a very useful publication. We know that it can be if you industrial hygienists in the field will do your part. Your contributions, your constructive criticism, are earnestly solicited. If you do not find in 'Industrial Hygiene' what you want, you will have no one to blame but yourselves.

"With your help 'Industrial Hygiene' cannot fail—without it, 'Industrial Hygiene' cannot succeed."

Alas, this editorial still holds true.

New York Studies Hazards in Ferro-Silicon Manufacture

From time to time special problems arise in the field of silicosis control. A somewhat unusual one is now under investigation in the manufacture of the alloy ferro-silicon, where the exposure is not to silica dust, but rather to silica particles released as fumes from the molten charge of electric furnaces.

In this study several concerns in New York State engaged in the manufacture of these alloys were visited and chemical tests were made to determine the nature and concentration of the fumes released into the furnace rooms.

The types and operation of the furnaces were essentially the same in all plants, with the exception that in one plant one of the three furnaces operated was an enclosed water-cooled furnace instead of the usual open-type furnace used for this work. In the operation of the closed furnace the fumes are not released into the workroom. But unfortunately this type of furnace is not practical for the manufacture of ferro-silicon alloys containing more than 50 percent silicon because of the necessity of manually controlling the charge in the course of its fusion. The furnace charges consisted of pebbles of quartzite, coke and steel turnings. It was due to the presence of quartzite in the charge and the high temperature (about 3,000° F.) at which the furnaces were operated that it was decided there might be free silica present in the fumes from the furnaces.

These furnaces are each about 20 feet in diameter and 12 feet deep and in some of the plants several of them are arranged in a row in the furnace room. They function by a combination of resistance and arc-heating for the production of the ferro-silicon alloys. Electric charge is supplied by several large carbon electrodes each about 2 feet in diameter which project down into the charge. The current from the electrodes passes through the charge to the shell of the pot and the heat generated by the arc plus that developed by the resistance of the charge melts down the material to form the alloy. The

smoke and greenish yellow flame released from a row of these furnaces in operation looks like conditions described in Dante's *Inferno*.

Because of the tendency of the fumes to rise directly from the furnaces due to the high temperature of the charges, natural ventilation is relied upon for the removal of the fumes to the outside atmosphere through openings in the roof and hooded vent stacks.

The chemical tests disclosed that the furnace fumes contained about 48 percent of amorphous free silica, the remainder being ferric oxide and carbon. They also disclosed that only a small amount of these fumes was present in the actual working area due to the fact that they rose almost vertically from the furnaces and passed out of the furnace rooms through the vent stacks and openings in the roof.

All X-ray pictures of these workers taken by plant physicians were carefully studied by a physician from our medical unit for evidences of silicosis. These X-rays, however, showed little, if any, evidence of silicosis. The reason is believed to be that since the vapors rise so rapidly, there is actually very little exposure at the breathing level of the worker. However, this matter is still under investigation and plans are being made for X-ray studies of all of these workers by the medical unit of the division.—*May R. Mayers, Division of Industrial Hygiene and Safety Standards, New York Department of Labor.*

Georgia Offers Short Course in Industrial Hygiene

Starting June 16 and ending August 30, the division of graduate studies of the Georgia School of Technology is offering a short course in industrial hygiene for engineers. The need for personnel in industry as well as governmental work prompted the arrangements for this intensive one-quarter course at graduate level.

It is designed to provide a comprehensive background for men with collateral scientific or engineering training who are interested in work in industrial hygiene.

Newspaper Plants Studied in Indiana

Labor unions requested the Division of Industrial Hygiene, Indiana Board of Health, to make a study of the lead exposures in 3 Indianapolis newspaper plants. Although no cases of lead poisoning were found, the study revealed that in certain areas of newspaper plants the workers are exposed to a lead hazard.

From five to six visits were necessary at each newspaper plant to evaluate the lead hazard. In the one plant, 18 atmospheric lead and 22 urinary lead analyses were made. Abnormal atmospheric leads were found on auto caster (17.3), sawing (10.7), and job pot (198.8). Urinary leads on the workers exposed to these levels were elevated in that all urines ranged from 0.1 to 0.169 milligram lead per liter of urine. The findings paralleled those reported in a similar study in Wisconsin.

In the second plant 8 atmospheric and 13 urinary analyses were done. High atmospheric leads were found on sawing (20.6) only. The rest of the plant had excellent controls. The men working on the saws were excreting around 0.14 milligram of lead per liter of urine.

High atmospheric leads were found in the third plant about the remelt pot (46.1) and sawing (14.3), but other areas were well controlled. A carbon monoxide hazard due to a leak from a vent was found and reported.

The division recommended that all 3 plants use vacuum cleaning for removing lead dust and exhaust ventilation for saws. Further recommendations were made for the first plant, including the elimination of blowing off of lead dust with air hose (auto caster), enclosing and exhausting remelt pot, bringing in fresh tempered and make-up air to the stereotype department.

OUR MISTAKE

In the April issue of the INDUSTRIAL HYGIENE NEWSLETTER, State publications carrying industrial health news were listed. "*Industrial Lights*" is published by South Carolina Division of Industrial Health, instead of North Carolina.

Schools to Include Industrial Hygiene in Health Course

High school students in Portland, Oreg., will learn the meaning of industrial hygiene and how it is practiced, especially in Portland industries. The superintendent of schools has announced that the unit will be taught as a part of the health course of study. This is the first time that industrial hygiene has been an integral part of such a high school course.

The lessons are designed to give students an opportunity to become acquainted with the health hazards they may meet in their future jobs, the physiological effects of the hazards and the preventive measures which may be employed. Emphasis is placed on the necessary cooperation of the workers to prevent occupational disability.

Eight industrial fields were selected for study in this unit. They are: meat and fish packing; cereal milling and processing; lumber, timber and wood working; canning and food processing; foundries, machine shops, and stone works; electro-plating and engraving; cleaning and dyeing; and textile knitting and weaving. All of these are prominent industries in Oregon and available to the students to visit and observe.

The Portland plan provides that at least two class periods should be devoted to each industry. The first period should be used for class study and discussion of the health problems related to the industry. The second period will be used for reports by the visiting committee appointed from the class and for the presentation of audio-visual material.

Guest speakers from industries and governmental industrial health staffs will be invited to talk to the students. Appropriate demonstrations and motion pictures of various industries in operation showing the medical and engineering controls are a recommended part of the unit. A bibliography of books, periodicals and other industrial health materials which are available to the students concludes the 70-page bulletin.

Authors of the publication were health education specialists, high school health teachers and members of the Division of Industrial Hygiene, Oregon State Board of Health.



Columbia Plans Program of Study for Industrial Nurses

Properly qualified graduate nurses are invited to enroll in a new program of study in Industrial Hygiene and Occupational Medicine which will be inaugurated in September 1947 by the School of Public Health, Columbia University, New York City.

The courses are designed to meet present day needs of nurses wishing to qualify as specialists, supervisors or consultants in the field of industrial nursing. Consideration will be given to historical developments, problems and hazards of the industrial population, trends and modern practices in the field of industrial hygiene in all of its phases. Particular emphasis is placed on the interrelated functions of the physician, nurse, engineer and chemist in the field of industrial medicine.

Applicants are required to have a bachelor of science or bachelor of arts degree, with graduation from an accredited school of nursing. Satisfactory experience in industrial, public health or hospital nursing is required. Experience in some form of supervision is desirable. Evidence of personal capability and fitness for industrial hygiene work is likewise considered in each case and will be regarded quite as essential as specific educational requirements.

The program of study extends over a period of 1 academic year or 1 calendar year in residence, depending on previous experience and preparation. Instruction will be built around the basic subjects of industrial hygiene, to include industrial medical organization, occupational diseases and advanced industrial nursing practice, with necessary background studies in such fields as communicable diseases, health education, nutrition, public health practice, vital statistics, epidemiology, and field work in industry and community agencies.

Ideas Exchanged With Guests From Other Countries

A number of physicians and engineers from private industries and government agencies of other countries have come to the Industrial Hygiene Division of the U. S. P. H. S. during the winter and spring months to learn more about the medical and engineering methods used in this country to improve industrial health. The exchange of information has been useful and interesting. In many cases, these visitors have also been guests of State divisions of industrial hygiene who report a mutual benefit and pleasure in the opportunity to share views and findings.

During the winter season, the following people were guests of the Division: Dr. Marcos Charnes, International Labor Organization, Montreal, Canada; M. R. Choi, M. D., P. S. Han, M. D., L. W. Whang, M. D., and I. H. Chu from the National Bureau of Public Health and Welfare, Seoul, Korea; Mr. Bogdan Teodorovic, S. E., Ministry of Public Health, Zagreb, Yugoslavia; Dr. Adelman Mendonca, Brazil; H. N. Acker, chemist, Division of Industrial Health, Department of National Health and Welfare, Ottawa, Canada; T. S. Achsumamam, Office of Health, Madras, India; Premysl Pelnar, M. D., Charles University, Prague, Czechoslovakia; Mr. Ivan Sabourin, Attorney, Montreal, Quebec; Dr. J. A. Vedal, chief, Tuberculosis Division, Montreal, Quebec; Dr. Ken Smith, Chief, Industrial Clinic of Thetford Mines, Asbestos, Canada; Dr. J. P. Cartier, Thetford, Mines; Dr. Sven P. Forsman, professor of industrial hygiene, State Institute of Public Health, Tomtebodav, Sweden; Dr. Emil A. Paluch, director of Industrial Hygiene, State School of Hygiene, Lodz, Poland; and Dr. Leo Noro, chief physician, University Clinic for Occupational Diseases, Helsinki, Finland.

COVER PICTURE

In one of the largest steel plants in the British Empire, Canadian workers play acetylene torches on heavy steel billets.—Photo by courtesy of the Canadian National Film Board.

20

OCCUPATIONAL DERMATITIS AND METHODS OF PREVENTION

By Louis Schwartz and
Paul C. Campbell, Jr.

I. PREPLACEMENT EXAMINATION

The prevention and control of industrial dermatitis may be divided into the following headings:

1. Prevention of dermatitis in industries where basic chemicals are manufactured.

2. Prevention of dermatitis in industries where basic chemicals are processed into materials to be sold to the public.

3. Prevention of dermatitis among users of such manufactured materials.

In order to obtain the best results in the prevention of industrial dermatitis and dermatitis among the public from chemicals and manufactured products, there must be close cooperation and interchange of information among all parties concerned. The purpose in the prevention of industrial and other forms of contact dermatitis is to keep the irritant apart from those exposed, or if this is not entirely possible, then to keep the time and degree of contact at a minimum.

In the factories making basic chemicals, all processes in which irritant chemicals are manufactured should be totally enclosed. Where total enclosure is not possible, then all such processes where there is exposure to irritants should be exhausted by properly designed suction vents. The floors, walls, windows, and ceilings of these work rooms should be frequently cleaned in such a manner as to create the least amount of dust and a minimum contact of the irritants with the cleaning crew and others in the work rooms. Machinery should also be frequently cleaned so that workers have minimum contact with potentially irritant chemicals. Machinery should be so devised that irritant chemicals may be mechanically handled in such a manner as to entail the minimum degree of personal contact, and the safe handling of irritant chemicals should be developed, taught, and enforced.

The above preventive measures all

From the Office of Dermatology, Industrial Hygiene Division, U. S. P. H. S.

come under the general heading of plant sanitation. The authors will not go into detail as to the installation of totally enclosed manufacturing processes nor into the approved methods of general and local ventilating devices designed to draw away from the workers irritant fumes, dusts, mists, and vapors. These details are in the province of the industrial hygiene engineer.

The scope of the industrial dermatologist includes the devising of and advising the use of methods for personal protection from these irritants. This should begin with pre-placement physical examinations.

Applicants for jobs who have skin eruptions should not be placed in occupations where there is an unavoidable skin hazard; for instance, they should not be placed where they must come in contact with such well known skin irritants and sensitizers as tetryl, TNT, formaldehyde, alkaline bichromates, volatile solvents, insecticides, antiseptics, and others too numerous to mention.

Patch Test

It should be emphasized that pre-employment patch testing for the alleged purpose of weeding out those who are sensitive to the chemicals with which they are to work is not practicable nor advisable, because most workers are not sensitive to the sensitizing chemicals with which they are to work unless they have had previous contact with them. They only become sensitized after working several days with allergenic substances. Therefore, patch tests with sensitizing chemicals performed before the worker has had contact with them will show no reactions and may be the means of sensitizing the worker. If the worker has been employed previously in a similar occupation, then a history of dermatitis caused by the chemicals he encountered may be elicited from him.

Hardening

Discussion of sensitization dermatitis would not be complete without mentioning [a few words about] the process of hardening, which was long

ago definitely established by the Office of Dermatology, and which since has been recognized and accepted by leading dermatologists and allergists throughout the world. By "hardening" is meant the disappearance or the failure of reappearance of an allergic contact type of dermatitis in sensitized individuals on repeated exposure in industry to the sensitizing chemical. Hardening may be permanent but in most instances it disappears if exposure is discontinued for any length of time. The degree of hardening varies also. Exposure to a greater concentration of the sensitizing chemical than that to which tolerance has been established may cause a recurrence of the dermatitis until a further decrease in sensitivity occurs.

Even those who doubt that this phenomenon occurs in industry will admit that an analogous phenomenon has been observed by both allergists and dermatologists in nonindustrial allergic contact eczema, which is after all the same disease process as industrial allergic contact dermatitis.

Young workers frequently have acne vulgaris and the preplacement examinations should make note of the site and extent of these lesions, especially in applicants for work with chemicals which are known to produce acne-like lesions. Such chemicals are coal tar and its heavy oils, pitch, solid chlorinated hydrocarbons, crude petroleum, cutting oils, and lubricants derived from petroleum.

Ringworm Infections

The presence of active mycotic infections on the feet and other parts of the body should be noted. If the applicants are otherwise employable, the fungous infections should be treated while they are working, and the parts affected should be properly protected from the action of occupational irritants. If there are shower baths in the factory, care should be taken to prevent the spread of fungous infections of the feet. This can be done by providing each worker with wooden-soled bathing slippers, and he should be instructed to wear them when going to the shower

(Con. on p. 9)

American Can Company's Industrial Hygiene Organization

L. V. Taylor*

The incidence of occupational diseases among employees of the American Can Co. has been practically nonexistent for the past 45 years. This low incidence of occupational diseases is ascribed to a number of factors including a minimum of hazardous industrial hygiene exposures connected with the industry, efficient engineering practices, effective safety practices and devices, and adequate medical control supported by an interest on the part of management to provide good working environments for its employees.

**This is the First of a
Series of Articles by Lead-
ing Industrial Hygienists
in Private Industry.**

Long before the term "industrial hygiene" was commonly applied to the practice of maintaining healthful working environments for its employees, all American Can Co. plants were well equipped with extensive ventilation systems and protective devices. In addition, company plants have long had services of physicians and trained nurses, and adequate first-aid rooms. In more recent years, preemployment examinations have been required and periodic physical examinations given employees at specified locations in areas where excessive exposures might conceivably occur.

For many years studies have been conducted by the research division of the company concerning possible health exposures resulting from the manufacture of containers. In addition, materials proposed for use in the manufacture of containers have been investigated and their safety from the employee, as well as from the public health standpoint, tested.

*Supervisor of Industrial Hygiene,
Research Division, American Can Co.,
Maywood, Ill.

Within the past 4 years the company reorganized its industrial hygiene program to provide additional facilities and direct access to top management. This latter arrangement was considered desirable since the complete control of hazardous practices is seldom a function of any one department in any company. A somewhat unique system in industrial approach to the problem was therefore initiated. A general health committee was established having the vice presidents in charge of manufacturing and of research and development, respectively, as co-chairmen. Other members of the committee include representatives holding executive positions in the manufacturing, industrial relations, insurance, engineering, enameling and decorating, and research departments or divisions of the company. In order to provide technical assistance to the committee, a new unit was established in the research division known as the industrial hygiene group.

The industrial hygiene group serves as an investigating and fact-finding agency and has been expanded to the point where constant instrument control of employees' working environments may be carried out. The group has also been equipped to establish the kind and intensity of illumination, to measure the efficiency of exhaust ventilation systems and natural systems, to make observa-

tions relative to temperature, humidity, and air motion, and otherwise to give attention to the various factors in the factory environment which might bear directly on the health of workers.

The American Can Co.'s approach to the problem is proving effective and this effectiveness can be attributed, in no small part, to the fact that the program has access to top management and that both staff and line management are represented in the program.

Laws in 33 States Help Disabled Workers

Since 1940, 33 States have facilitated the employment of their disabled veterans and others by workmen's compensation laws providing second-injury funds.

Thirty-three States—20 of them since 1940—have facilitated the employment of their disabled veterans and others by second-injury funds in workmen's compensation laws. In these States, employers pay compensation only for second injuries, while the fund relieves them of greater costs resulting from the combined disabilities. Thus, job discrimination against handicapped workers is minimized and injured workers get full compensation.

A second-injury fund bill drafted and approved by the International Association of Industrial Accident Boards and Commissions may be obtained from the United States Labor Department's Division of Labor Standards, Washington, D. C.

An effective law should apply regardless of how the first injury occurred—in combat, in industry, or otherwise. It should cover permanent total disability resulting from a second injury through the loss of a hand, an arm, a foot, a leg, or an eye following a previous loss of one of these members or organs. A second-injury fund should be set up, supported by payments of at least \$500 by an employer or insurer in the case of death of an employee having no dependents. The employer should be required to pay compensation for the second injury. The excess cost of both injuries combined should be paid from the fund.—*Labor Information Bulletin*. March 1947.



NOTICE TO GOVERNMENTAL INDUSTRIAL HYGIENISTS

If you are engaged in industrial hygiene in an official agency you are entitled to a free copy of the INDUSTRIAL HYGIENE NEWSLETTER. If your name is *not* on the mailing list and you want to receive your own copy, please send your name, position, street, city, zone, and State to the MANAGING EDITOR immediately.

INFREQUENTLY USED DUST SAMPLING EQUIPMENT

This material has been prepared by the Engineering Section, Industrial Hygiene Division, U. S. P. H. S.

The impinger, either large or small, has become the preferred instrument for the evaluation of atmospheric dust. However, other instruments are available to the industrial hygienist for atmospheric dust studies. Each has pertinent features that will have a bearing upon his choice of instrument. The principles of operation and the advantages and limitations of these adjuncts will be briefly discussed.

Soluble Filter

First to be considered are the filter methods, employing either soluble or insoluble materials. Soluble filters usually consist of granular or crystalline materials such as sugar, salicylic acid, naphthalene, and anthracene, of such grain size and used in such thickness that high sampling efficiency is achieved when air is drawn through the filter bed. Solution of the filtering material in a suitable solvent permits a dust count to be made.

Insoluble Filter

Insoluble filters have been developed in considerable numbers and in wide variety. Such devices have employed filter paper, cotton, cloth, aluminum and fritted glass filters, and glass wool. Filter paper especially has also been used for securing semi-quantitative information rapidly and easily by comparison with standard discolorations, either visually or photoelectrically. Recent work has indicated that dust collected on filter paper may be counted by washing out the dust with a suitable liquid and counting an aliquot by the standard procedure used with the impinger method. The resistance to air flow by filter devices is usually high and securing dust free filtering media is sometimes difficult. By employing a sufficiently large filtering area, high flow rates can be obtained. Such devices have been used to collect gravimetric quantities of air-borne dust.

Konimeter

Next to be considered are instruments of the impingement type. One that is compact, quite portable, will take a relatively large number of samples, and works well in medium to low dust concentrations is the Kotze konimeter. It has found wide acceptance abroad, especially in South Africa, but its use in this country has been rather limited. Dusty air, in 5- or 10-cubic centimeter portions, is forced through a circular orifice at high velocity and is impinged upon an adhesive covered circular glass plate. The application of the adhesive requires a considerable amount of skill and the count secured is based on a grab sample. A special microscope ocular grid is employed in the subsequent dust counting.

Owens Jet

Where a particle size distribution determination must be made, as well as a particle count, the sample of air-borne dust may be taken with an Owens jet dust counter, a thermal precipitator or an electrostatic precipitator. The Owens jet is often employed for this purpose because of its portability,

ruggedness, and the subsequent ease of mounting of the sample. The air to be sampled is saturated with water vapor in a plenum chamber attached to the instrument and a small portion of the saturated air is drawn forcibly through a slit and impinged on a microscope cover glass. The reduced pressure causes moisture to condense on the dust particles and in the wet condition they strike and adhere to the cover glass. As with the konimeter, a specially ruled microscope ocular disk is required for counting.

Also, only a grab sample can be collected. A separate cover glass is usually required for each sample but a modification of the instrument has been developed that permits several samples to be taken without "reloading."

Thermal Precipitator

The thermal precipitator is conceded to have the highest efficiency of all the methods employed for sampling atmospheric dust. In operation, dusty air is introduced into a space in which a considerable temperature gradient is maintained. This condition may be produced by a heated central wire and cooled

(Con. on p. 11)



KONIMETER

Illinois Advises in Labor-Management Dispute on Health Problems

Management and labor representatives from one of the large transportation companies recently requested the Division of Industrial Hygiene, Illinois Department of Public Health, to assist in the arbitration of a dispute which arose due to an alleged health problem from the use of paint remover.

The paint remover was applied by hand to large interior and exterior surfaces of railway cars without the provision of adequate control equipment. A sample of the paint remover, analyzed by our laboratory, revealed that it contained the following ingredients:

	Percent
Dichloromethane.....	67.5
Dichloroethane.....	26.0
Ethyl Alcohol.....	6.5
Plasticizer	

Our *Trade Names Index* indicated that this solvent was free of dichloroethane.

It was quite evident, without the necessity of atmospheric samples, that excessive concentrations of solvent vapors were present in the air. In addition to the engineering survey, the three men in question were given physical examinations and laboratory tests at a nearby hospital. Analyzing the subjective symptoms of the three patients, we found the following present: abdominal pains, nausea, vomiting, diarrhea, anorexia, sore throat, back pain, painful urination, frequent urination, dizziness, sleepiness, and headache. Physical examinations revealed no positive objective findings. Two individuals had leukocytosis and two had red blood cells in their urine. On reviewing the subjective symptoms of the patients, however, the similarity of their symptoms referable to the gastrointestinal, genito-urinary and central nervous systems was noted. Certain symptoms, such as those of the genito-urinary system which were substantiated by the findings of red blood cells in the urine, strongly suggested the possibility of toxic effects of the solvent on the kidneys or urinary bladder. The symptoms of narcosis indicates that the patients were inhaling sufficient concentrations to result in anaesthetic effects.

Based upon these medical and engineering findings, it was felt that the chlorinated solvents, dichloromethane and dichloroethane, were most likely the causative agents for the complaints and that the workers' complaints were merited.

Seven recommendations were made to plant management in the report, which included medical and engineering findings, and it was requested that the report be discussed jointly with the union and management representatives. At this meeting, a very fair attitude taken by both sides resulted in management agreeing to initiate immediately six of the seven recommendations advanced, and holding the seventh in abeyance until such time as the paint removing operations are more extensively conducted.

The division has noted the more frequent calls to determine facts in management-labor disputes relative to health problems. In such cases, the division serves only in the capacity as an impartial, fact-finding agency.—*K. M. Morse, Acting Chief, Division of Industrial Hygiene, Illinois Department of Public Health.*

Calling Your Attention

Two Government publications you will want to know about are "Some Basic Readings in Social Security" and "State Workmen's Compensation Laws." The former is a 94-page compilation of books and articles on the legislation and administration of the general social security program; social insurance, including old-age and survivors, unemployment and health; vocational rehabilitation; maternal and child health and welfare services; social security planning; the railroad social security system; and references in English to foreign systems of social insurance. This publication, No. 28, released by the Federal Security Agency, is available for 25 cents a copy from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

"State Workmen's Compensation Laws as of June 1, 1946" is a Department of Labor publication, available from the Superintendent of Documents for 15 cents a copy.

Arkansas Passes Act to Protect Workers' Health

The Arkansas State legislature passed the Industrial Health Service Act which establishes a Division of Industrial Hygiene within the State Board of Health. The act "provides for the protection of the health of the industrial workers by ameliorating and preventing occupational diseases and improving the environmental health conditions in industrial establishments."

The act authorizes the Division to investigate places of employment and to study the conditions which might be responsible for ill health of the industrial worker. The Board of Health will also adopt rules and regulations pertaining to the control of industrial health hazards.

OCCUPATIONAL DERMATITIS (Con. from p. 6)

bath, while he is under the shower, and when coming from it.

It is not sufficient to have antiseptic solutions in troughs into which the workers are required to step after they have taken their showers, because in general the feet are not soaked long enough for the fungi to be killed, but even if they were, walking barefooted from the troughs to the lockers allows plenty of opportunity to pick up or spread the infection. The workers should also be instructed to dry their feet thoroughly and dust powder between their toes before putting on their hose. The fungi do not grow in dry media. There are many powders on the market for this purpose, and most of them contain some antiseptic, such as oxygen in the form of perborates and peroxides, and other fungicidal chemicals.

Applicants who have dry skins should not be placed at jobs where they must immerse their hands in fluids that defat the skin, such as strong soaps, alkaline solutions, or the volatile solvents.

(The second subject to be covered in this series is "Cleanliness" and will appear in the July issue.)

CANADA PREPARES FOR SPECIAL INDUSTRIAL HEALTH SERVICES

Peering over our northern fence, we find the Industrial Hygiene Division of Canada's Department of National Health and Welfare concerned with many of the same problems encountered in the United States.

In the Canadian Trades and Labour Congress Journal, industrial hygienists, looking at the job ahead, say: "A glance at the industrial scene will show why so many specialized services are required in an industrial health division. The techniques of modern industry are developing at an ever expanding rate and have accentuated the need for industrial health facilities. Although a great deal has been learned about many of the new materials introduced during the war and scheduled for wide use in consumer production, industry is faced with the potential hazards of entirely new processes, new types of jobs, and still newer materials. The manufacture and processing of plastics and synthetic rubber on a large scale are here to stay. So, also, are welding and fabrication of light and heavy metals, X-ray inspection of industrial materials, and a dozen others.

"Each of these new technologies harbours a potential hazard of a serious nature which must be investigated and controlled. Persistent research must provide the answer to new hazards and define our control of old ones. Towards this end, the close cooperation of industry and governmental industrial health services is essential to coordinate the knowledge and experience of both groups."

Emotional Tension

"The reconversion period has emphasized the need for industrial health measures in still another direction. The demobilization of our armed forces and of war industries has resulted in a large turn-over of workers to new jobs with attendant social and economic dislocation that augments the problem of medical care, particularly in relation to industrial health. In a period of rapid change and adjustment to new work situations, employees may be affected by emotional tensions as well as by exposure to unhealthy physical

environments. Accidents, absenteeism, and labour turn-over may occasionally be symptoms of lack of adjustment to new jobs, new responsibilities, and new situations either at home or at work.

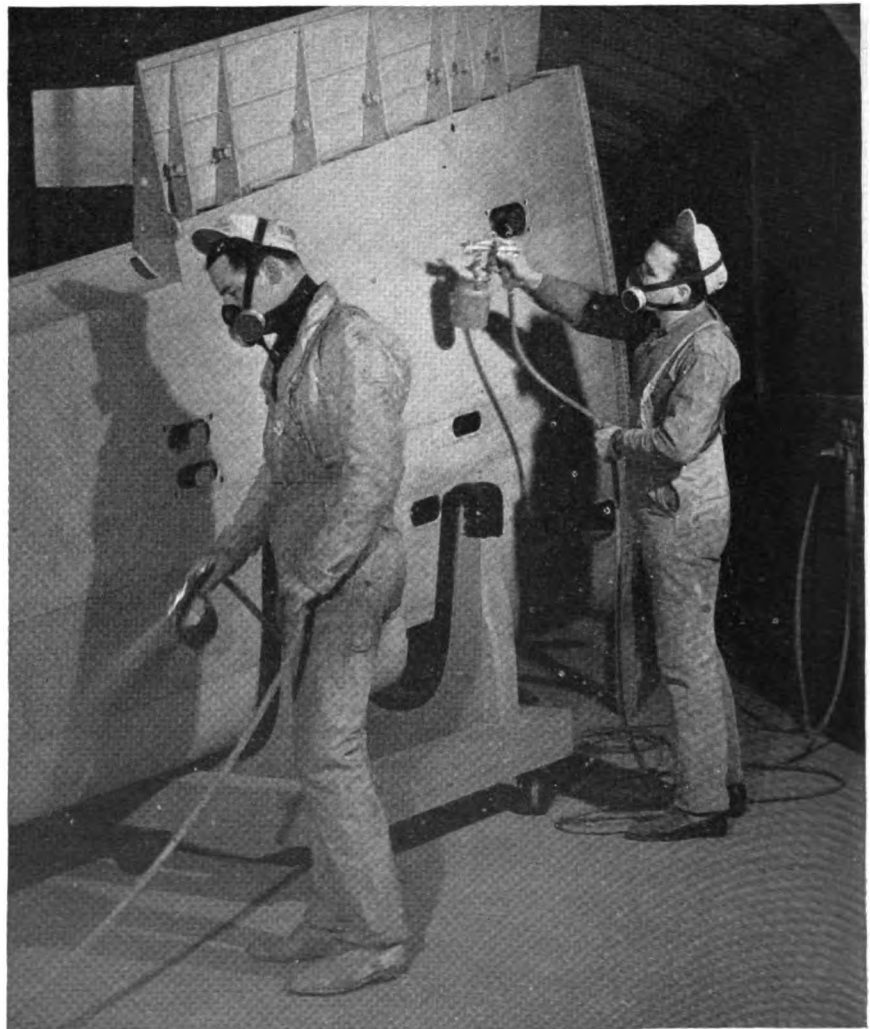
"The anxieties of industrial personnel associated with the reconversion phase can be eased by the application of common sense psychology or 'man management' and the spirit of give and take. There is an urgent need to alleviate needless emotional stress by approaching personnel and rehabilitation problems in industry in a rational and not

too hurried a manner. Health services in industry are an essential part of any method which seeks to cope with these problems.

Signpost to the Future

"If the war has taught any lesson, it has demonstrated conclusively that the health and even the lives of wage earners can and must be protected from hazardous exposures. It has taught that occupational disease and disabilities can be controlled and that industrial hygiene methods therefore should be a part of modern industrial practice.

"The war showed that labour and management can cooperate in a field of mutual benefit such as industrial health.



Protected by respirators, these workmen are giving the plane wing a generous spray of "dope" in this Montreal plant.—Courtesy of Canadian National Film Board.

Several hundred plants created Labour-Management Committees among whose functions was health and safety control. Despite disputes in other matters, the accomplishments of these committees have shown that through such cooperation between labour and management, and with technical assistance from governmental industrial health divisions, better industrial health programs have resulted.

"Much has already been accomplished through general public health endeavours as evidenced by the gradually increasing health standards of our people. But much remains to be done. Large numbers of Canadian plants still do not make use of the industrial health services available to them. With the proper cooperation of industry, labour, government, and the various professional agencies, the Canadian people should be able to accomplish far more in the achievement of high health standards for industrial workers within the next decade than in all the past years of our industrial history."

BERRY TALKS TO GEORGIA GRADS

Upon the invitation of the Division of Industrial Hygiene of the Georgia Department of Public Health and the Georgia School of Technology, Clyde M. Berry addressed the engineering graduates of Georgia Tech on careers in industrial hygiene. Dr. Berry, who is Chief of the Engineering Section, Industrial Hygiene Division, U. S. P. H. S., spoke to a group of about 75 on the opportunities open to them in the field of industrial hygiene.

In pre-arranged, personal interviews with 18 men, Dr. Berry discussed in more detail the professional advantages of careers in industrial health work. He learned from each senior what phase of engineering he was particularly interested in, what part of the United States he preferred to live in, and other pertinent information. These data are available to the States that need personnel.

In view of the shortage of trained men and women in this field, recruitment efforts of this kind are important. District industrial hygiene consultants have been requested to get salary and

qualification information to graduates in engineering and medicine in their States. A consultant may also serve as intermediary for both States and industries in need of industrial hygiene personnel.

Alert to the necessity for training these men, Georgia School of Technology is offering an intensive, 12-weeks training course, starting June 16. Details appear on page 4.

DUST SAMPLING

(Con. from p. 8)

walls. The dust is precipitated on the cold surface. The device may be static or dynamic. If dynamic, the volume of air sampled is proportional to the sampling time, but the rates of air flow are very small, usually less than 10 cubic centimeters per minute.

Electrostatic Precipitator

Electrostatic precipitators have been demonstrated to be highly versatile. The dusty air is introduced into a space between two electrodes maintained at a high difference in potential. Provision may be made to ionize the particle or the charge already existing on the particles may be sufficient to insure the movement of the particle in the electrical field to the collecting electrode. Alternating or direct current may be used but a higher alternating current voltage is required for an equivalent sampling efficiency. This instrument, too, may be static or dynamic. If dynamic, the efficiency is usually a function of the sampling rate. By suitable adaptation of the principle, the air-borne dust may be evaluated gravimetrically, by particle count, and by particle size distribution. Since it may be used at high rates of flow it is usually the instrument of choice for small particles in low concentrations such as fumes.

For dust work, emphasis is placed mainly on the gravimetric data it may supply. The sample may subsequently be subjected to chemical analysis to provide pertinent information on the composition of the air-borne contaminant to correlate with similar information secured by the analysis of settled particulate matter and the parent material.

WISCONSIN SPONSORS IN-PLANT CLINICS

Three industrial in-plant medical clinics sponsored by the Committee on Industrial Health of the State Medical Society of Wisconsin in cooperation with the Industrial Hygiene Unit of the State Board of Health proved to be a success, according to the physicians and nurses who attended the sessions. The meetings were held April 8, 9, and 10 at Racine, Fort Atkinson, and Green Bay, respectively. A total of 369 persons registered. Among those were 235 physicians, 113 industrial nurses, and 21 other representatives interested in industrial health programs.

In each clinic, the morning was devoted to a complete tour of an industrial plant where the manufacturing processes were explained, paying particular attention to the health and safety hazards of each operation and the control measures used to prevent disabilities. Emphasis was placed on the plant medical department—its operation, the procedures and policies developed, records and forms in use, and the health and accident experience of that department.

During the afternoon sessions, the following outstanding national industrial medical authorities presented discussions on common industrial health problems:

"Providing Health Services in the Small Plant"—Dr. Carl M. Peterson, secretary, Council on Industrial Health, American Medical Association.

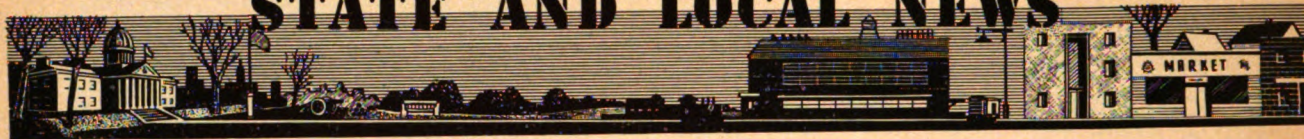
"Occupational Skin Diseases"—Dr. Harry R. Foerster, chairman, Committee on Occupational Dermatoses, Section on Dermatology, American Medical Association.

"Pulmonary Affections Caused by Dusts, Fumes, and Gases"—Dr. Norbert Enzer, clinical pathologist with special interest in industrial medicine.

"Metal Poisons"—Dr. Robert A. Kehoe, director, Kettering Laboratory of Applied Physiology, College of Medicine, University of Cincinnati.

"Health Hazards Resulting From Exposure to Organic Solvents"—Dr. John H. Foulger, medical director, Haskell Laboratory of Industrial Toxicology, Wilmington, Del.; Associate Professor of Industrial Health, Medical College of Virginia.

STATE AND LOCAL NEWS



LOS ANGELES, CALIF.

Electroplating—A major activity of the Division has been the continuation of the inspection and survey of the electroplating industry, in compliance with the action taken by the city council following the explosion in a plating plant. Over 50 electroplating establishments were visited and no evidence was found to indicate the use of dangerous chemicals or processes likely to produce a disaster. So far in the survey it seems that the greatest hazard arises out of the improper storage and placement of materials used in the plating processes. The storage or placement of acids in close proximity to cyanide salts constitutes one of the chief dangers against which operators have been cautioned. Other hazards are those commonly associated with the industry, largely inadequate local ventilation of plating tanks and degreasers, and poor housekeeping.

ILLINOIS

Industry Survey—The Chicago-Cook County survey which was conducted during 1946 has been completed. One phase of this survey related to industrial hygiene and consisted of a very extensive analysis of the problem with sound recommendations. At the request of various interested individuals and agencies, the State department of public health has agreed to publish the Industrial Hygiene Survey separately, since the entire report will be somewhat delayed. The Department plans to multilith 2,000 copies of this report for limited distribution.

Laundry Service—A new type of laundry service inaugurated in the Chicago area since the war has presented certain health problems caused by the lack of ventilation. Washing machines and driers have been installed where housewives can bring their clothes for washing and drying for a small charge. Most of these laundries are

installed in what were previously small stores with no ventilation facilities. The driers are gas heated in most cases and during the winter months when there is no provision for introducing fresh air into the rooms, attendants have complained of poor ventilation and possible carbon monoxide problems. Since health officers in surrounding cities also have requested assistance, the Division is investigating the problem.

KENTUCKY

Foundry Survey Reported—"An Evaluation of Lead and Zinc Fume Hazards in the Brass Foundries of Kentucky" by W. W. Stalker is the principal article in the February issue of the *Kentucky Health Bulletin* which is devoted almost entirely to the subject of industrial hygiene. W. W. Stalker and J. Emma Grady, chief nurse, General Electric Co., Ken Rad Division, Owensboro, collaborated on an article entitled, "The Standardization of Industrial Nursing Service."

Personnel—Wilber A. Mitchell, chemist, has been added recently to the Industrial Hygiene staff. Mr. Mitchell has had wide experience in the field of organic chemistry through his former connections in dyes, textiles, and petroleum.

MASSACHUSETTS

Health Services—A committee is working to provide health services for industries in the Massachusetts south-shore area. Participating on the committee are representatives of the Quincy Chamber of Commerce, Massachusetts Department of Public Health, Committee on Industrial Health of the Massachusetts Medical Society, the Norfolk County Medical Association and the Massachusetts Division of Occupational Hygiene. A preliminary survey of the area, including 131 plants with 15,252 workers, indicated that only 9.9 percent of the plants had nursing

services, covering 65.3 percent of the employees, and 40.5 percent of the plants had medical services, affecting 80.6 percent of the employees.

Photoengraving—The Division has recently conducted a survey of 15 photoengraving plants located in Boston. Nine of these plants used benzol for the cleaning of plates. Quantities of benzol used varied between one-half and ten gallons per month. While this use probably does not result in excessively high concentrations, recommendations for substitution of this solvent by toluol are being made. In three of the plants toluol is used which indicates that this recommendation is practical.

It was also found that the original containers for the benzol were labeled in accordance with the Massachusetts benzol labeling law, but that the plant operators had transferred the benzol to unlabeled bottles of varying descriptions. The division is recommending the elimination of these bottles and the substitution of safety cans.

The Division of Industrial Safety, in cooperation with the Division of Occupational Hygiene, has promulgated rules and regulations relative to the sale, distribution, and use of benzol.

Static Eliminators—The engineering staff of the Division has made a survey for hazards due to radiation in radioactive static eliminators which are currently being used in plants where paper cloth is handled. The static eliminators are extremely valuable to the industries, in that they permit proper processing of paper and they minimize the fire hazard where cloth is coated with volatile organic compounds.

Publication—"New Clinical Syndrome: Delayed Chemical Pneumonitis Occurring in Workers Exposed to Beryllium Compounds," by Dr. Harriet L. Hardy of the Massachusetts Division of Occupational Hygiene, has been published in the *Bulletin of the New England Medical Center*, for February 1947.

ST. LOUIS, MO.

Reporting of Occupational Diseases—The Industrial Hygiene Section has revised the reporting card on which physicians are expected to notify the Health Division of cases of occupational disease under their care. This new card is more simple in form, requires the filling in of less information than previously requested and may be mailed to the Health Division without a stamp under the franking privilege extended the Division for such purposes. With the issuing of the new communicable disease code and this new card an effort is being made to stimulate physicians in the reporting of occupational diseases. The Section expects, through a continuing educational campaign, to secure a more adequate reporting of occupational diseases in St. Louis.

Floor Coverings—Among the educational activities carried on by the Section was a lecture given by the industrial sanitarian on proper floor coverings, their cleaning and maintenance. The lecture was given for Food Control Section inspectors and sanitarians. Samples of various floor covering materials and examples of the results of proper and improper maintenance procedures were used to demonstrate the lecture.

MONTANA

Stray Ray Survey—A complete State-wide survey of the exposure of technicians and radiologists to stray X-ray radiation has recently started. Several hospitals and clinics have already been studied in the evaluation of this hazard.

NEW JERSEY

New Bulletins—"Ventilation" is the subject title of the fifth in a series of industrial health bulletins written and distributed by the New Jersey Division of Industrial Health. General ventilation, local exhaust, and maintenance of exhaust systems as they are used in an industrial plant are explained simply and effectively for the layman in industry.

The sixth of the series of bulletins is a review of the purpose and procedure of a plant survey. In the first phase of a survey the surveyor with the direction and assistance of a plant supervisory employee observes all the plant opera-

tions, the materials used and the facilities provided for the protection of the worker's health.

The second phase of the industrial hygiene plant survey is the atmospheric study at those operations where toxic or harmful conditions were thought to exist, and to measure the controls in effect over other known toxic materials. The third part is the recommendatory report, and the last is the follow-up.



OREGON

Visual Study—Arrangements have been completed with Portland City Health Department and Bausch & Lomb Optical Co. to conduct a 4-year study of visual capacities as related to vocational guidance and placement at Benson Polytechnic Institute. This study, as a part of industrial hygiene education for technical students, will be based upon the ortho-rater program. The city is sending a public health nurse to Purdue University to learn the details of statistical compilations and operation of the program. All arrangements have been completed to institute the study next fall. As this is the first such study made on high school students, the entire program is of interest to all concerned with industrial hygiene education and safety.

Nursing Services—The annual census of registered nurses in industry shows that in spite of the elimination of large war-time staffs the number of industrial nurses is 65 as compared to 68 in 1946. Within the year, three new nursing services have been established—one in a large department store, another in a transportation industry, and the third, in a lumber plant.

PENNSYLVANIA

Survey of Nurses—A survey to determine the number of full-time industrial nurses employed in Pennsylvania has recently been completed by one of the industrial nursing consultants of the Bureau of Industrial Hygiene.

The results of the survey, reflecting conditions as of March 1, 1947, show that a total of 570 full-time industrial nurses, all females, are employed in the State. These 570 nurses are employed in 273 of the State's industrial establishments. The greatest number of nurses, 509, was found to be engaged in the ordinary "in plant" type of nursing service, the care of minor accidents, and the operation of dispensaries, etc. Other types of nursing service and the number of nurses engaged in each included industrial hospital nurses, 2 personnel department nurses, 17; visiting nurses, 11; and supervisory nurses, 5. The metal industries employ 336 or 59 percent of the industrial nurses in the State.

High School Talk—Mr. Wm. H. Taylor, assistant industrial hygiene engineer, lectured on "Protective Devices" before a group of mechanical arts students at the Chester High School, Chester, Pa. Many of these young men intend to enter mechanical trades upon their graduation and Mr. Taylor's subject was of special interest to them.

RHODE ISLAND

Personnel—Raymond J. Kelly, who served in the Army until recently, has resumed his duties as chemist with this Division. Mary O'Brien, chemist, has also joined the staff.

Textile Industry—Plans are under way for a complete study of the textile industry which is the largest industry in Rhode Island.

VIRGINIA

Conjunctivitis—Three cases of acute conjunctivitis occurring among the employees of a painting contractor were reported to this Bureau by the Industrial Commission. Investigation to determine the cause of these cases disclosed that the men had been painting the ceiling of a restaurant in which indirect ultraviolet lamps had been installed. The painters were not aware of the injurious effects of these emitted rays, and the proprietor of the establishment did not warn them. This hazard could have been controlled by turning the light off. With the increased use of ultraviolet lamps, it is not unlikely that injuries of a similar nature will occur with increasing frequency.

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.



HERE'S HOW

Similarly the following advantages over conventional mechanical instruments are experienced:

1. Lower initial cost.
2. Lower maintenance cost.
3. No recalibration required after extended period of use.
4. No skill required for cleaning.

The following disadvantages may be experienced when modified for other uses:

1. Not readily adapted to more than one rate of flow unless multiple or graduated floats are used.
2. Not adapted to large differences in liquid level. (Such instruments could be constructed but would need protection from breakage by more rugged construction.)

The following precautions should be observed in constructing and maintaining an instrument similar to that shown in figure 1 for use on the electrostatic precipitator.

1. Select tube sizes to permit:
 - a. Bubbling before the outer

tube liquid level reaches the top.
b. Approximately equal liquid levels at no flow.

c. Free movement of the float in the annular space between the inner and outer tube.

2. Make the floating scale of such buoyancy that the bulb will touch the outer tube below the liquid level. Several trial floats must be made to obtain the minimum desired buoyancy to prevent the floating scale from sinking.

3. Make the floating scale as small as practical not to sacrifice sturdiness.

4. Use distilled water in the flow meter.

5. Make the hole in the inner tube for fluid passage near the bottom to utilize the entire tube length.

6. Periodically disassemble and thoroughly wash the tubes and float with warm soapy water to remove any foreign matter; rinse in distilled water before reassembly.—D. P. Roberts, Tennessee Department of Public Health.

FLUID FLOW MEASUREMENT With a Modified Manometer

A pressure difference indicating instrument designed for use on electrostatic precipitators in place of the mechanical gage furnished with the apparatus is described. It is believed to have some advantages over this mechanical gage or the conventional U tube.

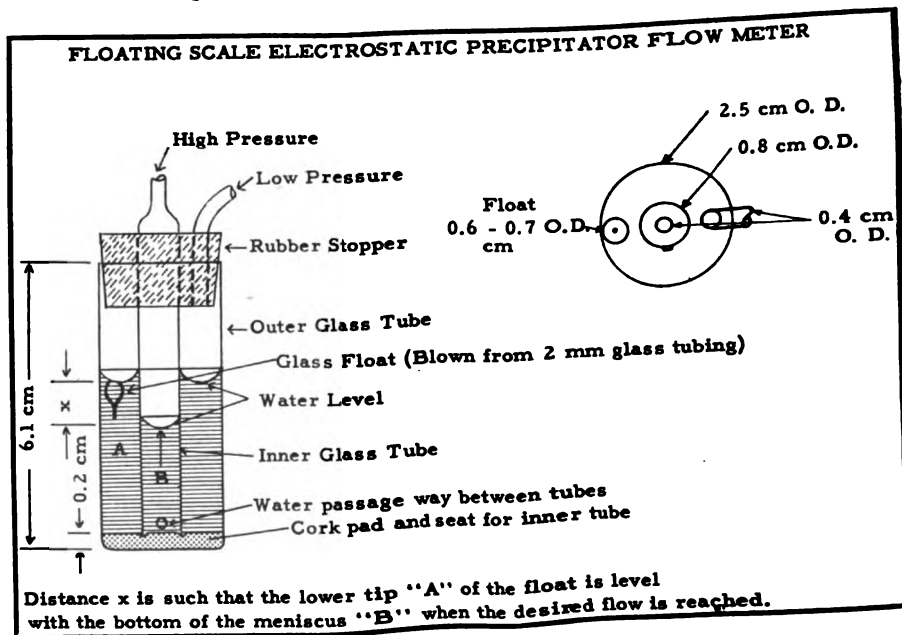
The instrument shown in figure 1 consists chiefly of concentric glass tubes with provision for the flow of fluid from one to the other near the bottom of the inner tube, and a floating scale in the annular space between tubes for determining the depression of the liquid in the inner tube when the liquid in the annular space is at a lower pressure than that in the inner tube.

When constructed as shown the in figure and used in metering gases the following advantages over a conventional manometer or U tube are experienced:

1. No appreciable loss of liquid to the gas being metered when the flow exceeds the capacity of the instrument.

2. Variations from the vertical position result in no errors so long as the floating scale is free.

3. No exact initial liquid level is required even though only one liquid level need be observed.



HOW WE RECORD NEW PLANTS

The system of checking new plants in the State, now in effect at the Bureau of Industrial Hygiene, Connecticut State Department of Health, may be of interest to other bureaus. A list of plants registered during the month (State law requires all plants to register) is sent to the bureau by the State Department of Labor and Factory Inspection. For each factory on the list a card is typed giving the name and address. These cards are filed by town, and, within town, alphabetically by company. A labelled folder is also made for the company and filed in the same manner as the cards.

When a bureau engineer or chemist sets out to resurvey a plant in Bristol, Conn., for example, he will also take along some new plant folders and make as many surveys as time permits. Or it may be that a field worker will have an assignment made up entirely of new plant surveys.

From the plant survey report, the following information is added to the company card—number of employees, classification (by product), date of survey, and date scheduled for resurvey. The card is then checked in red in the upper right corner and transferred from the "New plant file" to the "surveyed plant file."

When the survey report is typed, the survey and resurvey date are written inside the front flap of the folder. A duplicate or "copy" folder is made up containing a carbon copy of the report. While the original folder is filed (after being reviewed and any necessary follow-up initiated) in the "plant file," arranged alphabetically by company, the duplicate folder is filed in the "copy file," arranged by town. The two folders have different colored labels and the plant folder is always kept in the office, while the copy one may be taken into the field.



INDUSTRIAL TOXICOLOGY

Lawrence T. Fairhall, Ph. D., U. S. P. H. S.

CHROMIUM

The commercially important chromium compounds relate principally to the trivalent and hexavalent types of which the latter are by far the more important. The toxic action of chromium is confined to the hexavalent compounds of chromium. Trivalent salts show none of this toxic effect. In animal experiments cats which have been given as much as one thousand milligrams of chromic phosphate or chromic carbonate in their food per day or caused to inhale up to two hundred milligrams of carbonate over a period of seventeen weeks, exhibited no sign of illness, loss of weight or tissue damage. The growth of chromium plating and the increased household utilization of stainless steel has posed the question of the hygienic significance of chromium in food and drink. However, the chromium that is taken up from chrome steels or chromium plated ware by food and water enters solution as a chromic salt and not as a chromate or a dichromate. The latter require powerful oxidizing agents for their formation. Chromium plating exposes the worker to spray or mist and has given rise to much occupational ill health. Workmen are frequently afflicted with dermatitis, with perforation of the nasal septum and, where splashing of the liquid occur in contact with skin abrasions, with chrome ulcers or "chrome holes."

While systemic poisoning from chromates is rare, the unpleasant effects of exposure to chromic acid mist or to chromate dust where environmental control is inadequate are likely to lead to a large labor turn-over. A more recent type of exposure to chromic acid mist occurs in anodizing operations which is an operation in which a coating highly resistant to corrosion is formed on aluminum and its alloys through the anodic oxidation of the aluminum. Chromic acid is used as the solution in which the anodizing operations are carried out and may attain a concentration as high as 10 percent. The hydrogen liberated during the anodizing operation carries a significant amount of chromic acid mist along with it. Greenburg and his associates

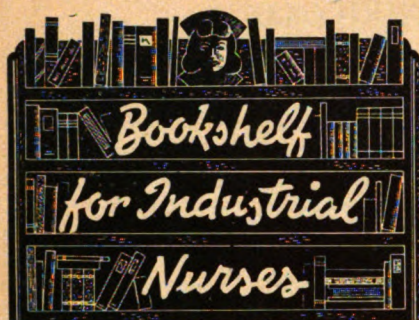
have indicated a new source of chromate exposure with reference to spray painting. In a survey of 106 painters in a large airplane factory in New York State, five cases of perforated septum were found which were attributed to the large amount of zinc chromate pigment present in the paint. Gross has reported several cases of lung cancer in Germany during the war in plants where workers were exposed to zinc chromate dust.

The maximum allowable concentration of chromium as chromate or dichromate dust, or as chromic acid mist has been suggested as one-tenth milligram of chromic oxide (Cr_2O_3) per cubic meter of air.

(This is a continuation of a series of articles by Dr. Fairhall, Industrial Hygiene Division, U. S. P. H. S., on the toxicology of various substances of industrial hygiene significance.)

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INDUSTRIAL RELATIONS HANDBOOK, J. C. Aspley, and E. White-more. The Dartnell Corp., Chicago, 1943.

While this handbook was written for American employers, it will give the nurse a general background of the policies and practices that have been tested and used successfully by leading business and industrial plants in promoting sound human relationships. The duties and responsibilities of management and labor are presented to stress cooperation which is essential to obtain the ultimate in production.

The sections of particular value to the industrial nurse are: Women in Industry; Employment Methods; Confidential Employee Record; The New Employee; Problem of the Old Employee (Retirement Plan); Nutrition Programs for Workers; Specifications, Equipment and Approximate Cost of Setting up a Medical Department; and Relations with Employee's Family and the Public.

SOcial ASPECTS OF INDUSTRY (A Survey of Labor Problems), Howard S. Patterson. McGraw-Hill Book Co., Inc. Third Edition, New York, 1943.

This readable textbook presents a general survey of social problems in industry.

The book is divided into six parts, namely: (1) The Background of Labor Problems; (2) Problems of Income; (3) Human Conservation and Labor Legislation; (4) Collective Bargaining and Labor Organizations; (5) The Approach of the Employer; and (6) Comprehensive Programs of Economic Reconstruction.

Conflicting points of view are presented and the reader is left to make his own selection. Each chapter is fol-

lowed by questions for discussion and selected references. While the book is a textbook the nurse who is interested in the problems mentioned will find it profitable and interesting to study one of more of the chapters. It should be available for loan at the local or State library.

THE TB PROGRAM AT EASTMAN KODAK, C. R. Allison, M. D. "Breakdowns held to minimum by Rochester company's policy of pre-employment and periodic chest X-rays plus close supervision by medical department."

The description of this program which was initiated in 1933 includes the schedule for the periodic examinations, a report of the active cases, and the constructive effect of early discovery of the disease both upon the period necessary for cure and upon the resulting degree of handicap.

The article appears in the March 1947 issue of the *Bulletin of the National Tuberculosis Association*. The *Bulletin* is usually available in the office of the local Health Department and perhaps in the local library. It may also be obtained from the National Tuberculosis Association, 1790 Broadway, New York 19, New York.

THE TRUTH ABOUT UNIONS, Leo Huberman. Reynal & Hitchcock, Inc. New York, 1946.

This short and readable book expresses concisely the purpose of the unions, why they were started and how they function. There is a good discussion of the differences between management and labor, and contrasts the position of the unorganized workers with those who are organized in unions. It explains the important difference in the types of organization of the AFL and CIO programs.

Of interest are the graphic diagrams illustrating the structure of the AFL and CIO organizations, also one on the distribution of the workers' dues.

The book is divided into several parts discussing briefly the employer, the worker, the law, the various unions, collective bargaining, strikes and the necessity for Unions.

The appendix carries the Directory of American Labor Unions, classified according to industry and affiliation.

HEALTH-BENEFIT PROGRAM ESTABLISHED THROUGH COLLECTIVE BARGAINING (Bulletin No. 841, U. S. Bureau of Labor Statistics), E. M. Kassalow and J. R. Nelson. U. S. Government Printing Office, Washington 25, D. C. Price 10 cents.

In this bulletin health-benefit programs are evaluated, and divided into three types according to their method of administration: (1) Those administered solely by the union, (2) those administered jointly by the union and employer, and (3) those administered by a private insurance company which undertakes the responsibility for determining eligibility claims and payment of benefits.

General characteristics of the programs, such as financing of plans, benefits provided, eligibility requirements, transfer and conversion of policies, and enforcement of provisions are discussed briefly.

This article has appeared in the *Monthly Labor Review*, August 1945, but is now available as a reprint.



"Guide to Health Organization in U. S." Available

A reference guide to the organization and relationship of health agencies in this country has been prepared by the U. S. P. H. S. and may be bought for 20 cents from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. "Guide to Health Organization in U. S." is Miscellaneous Publication No. 35.

The pamphlet brings together in simple, brief form the functions of the many agencies which render health services in the United States. The authors have pointed out the contributions of Federal, State, and local official and voluntary agencies and of private physicians, dentists, and nurses. The result is a panoramic view of the entire health structure of our Nation.