Industrial Hygiene

DECEMBER 1947

VOL. 7, No. 12

NEWSLETTER

INDUSTRIAL HYGIENE NEWSLETTER

Volume 7 | December 1947 | Number 12

Issued monthly by
INDUSTRIAL HYGIENE DIVISION

FEDERAL SECURITY AGENCY
U. S. PUBLIC HEALTH SERVICE

WASHINGTON 25, D. C.

This publication is free to persons engaged in industrial hygiene in governmental agencies (Federal, State, or Local). For sale by Superintendent of Documents, Government Printing Office, Washington 25, D. C. Rates—$1 a year (Domestic); $1.25 (Foreign).

Approved by Director, Bureau of the Budget, as required by Rule 42 of the Joint Committee on Printing

CONSULTANT APPOINTED FOR DISTRICT 1

Harry Heimann, Senior Surgeon, USPHS has been assigned as the Industrial Hygiene Consultant to USPHS District 1 Office, New York City. Dr. Heimann is the first person to fill that position in District 1. In September 1946, when consultants were assigned to other Public Health Service Districts, personnel was scarce and District 1 was serviced from the Washington office.

Industries in the N. eastern area are familiar to Dr. Heimann who worked in the Division of Industrial Hygiene and Safety Standards, New York Department of Labor, for 5 years before entering the USPHS in 1943. He had been in charge of the Syracuse office for 3 years when he was transferred to Washington in 1946. Dr. Heimann recently cooperated on a public health survey of the city of Pittsburgh made by personnel from USPHS District 1. He was responsible for the industrial hygiene phases of the survey.

The States to which Dr. Heimann's services are available are Maine, New Hampshire, Massachusetts, Connecticut, Vermont, Rhode Island, New York, New Jersey, Pennsylvania and Delaware.

SHOE TRADE STUDIED IN NEW HAMPSHIRE

In a survey of 53 shoe-manufacturing plants in New Hampshire, the Division of Industrial Hygiene of the State Health Department found that the greater percentage of the workers were not exposed to health hazards.

A detailed report of the study and photographs of many of the operations have been printed in a 32-page booklet, copies of which have been mailed to all those concerned in New Hampshire.

The potential health hazards which exist in a shoe plant from the use of a large variety of chemical agents used in the manufacture of shoes are explained, and tables showing the concentration of solvent vapors in the air at the time of the survey are given. An analysis has also been made of the medical and first-aid facilities available in the plants.

Careful explanations are given for the recommendations made by the division to control the conditions which are hazardous to the health of the workers in this trade.

Single copies of this report entitled, "A Study of the Potential Health Hazards in the Shoe Manufacturing Industry," may be obtained by writing the Division of Industrial Hygiene, State Department of Health, 17 School Street, Concord, N. H.

DETROIT SALT MINE INVESTIGATED

An investigation made by the Detroit Bureau of Industrial Hygiene of a Detroit salt mine showed that gasoline-powered vehicles can be used safely in the mine without excessive carbon monoxide exposures. The mine is operated 1,300 feet below ground level and extends a number of miles from the main shaft in the 1,300-foot plane. Multiple electric drills are used for drilling the

heading. The salt is blasted out and loaded on gasoline-powered trucks and conveyed to the main shaft. These trucks have replaced an electric tramway system, requiring steel tracks. Nine motor vehicles are used in this mine.

In most instances a vertical extension pipe has been placed on the exhaust pipe to discharge products of combustion toward the 20-foot ceiling. Air determinations indicate that in most working areas the CO is below 0.01 percent and the oxides of nitrogen from the blasting are below 10 p. p. m. Mechanical ventilation and the large cubical volume of the mine dilute the CO to a safe concentration.

The mine operates a highway crew for grading and maintaining the roadways. Large trucks are successfully brought down the mine shaft by cutting the truck in two with a welding torch and rewelding it together underground.

Texas Issues Booklet on Natural Lighting for Classrooms

In an effort to improve vision in the Texas schools, the State Department of Health has issued a booklet called *Natural Lighting for Classrooms*. Studies have been made in numerous schools to determine what steps should be taken to improve the use of natural light. The investigators learned that uniformity of brightness has a very important bearing on the usefulness of light, and came to the conclusion that the goal for brightness ratios in any given field of vision should be less than 5 to 1 and preferably 3 to 1.

The recommended practices were devised for correcting existing defects in previously constructed buildings. They include painting the ceiling and upper portion of the walls, down about 24 inches, with a flat white paint with a light reflectivity of 85 percent or higher. How to paint and finish the walls, floor, woodwork, and other parts of the room is explained in detail.

COVER PICTURE

Emergency dental care for employees on the job reduces pain and discomfort and saves thousands of man-hours of working time.

WANTED— A LIGHT-WEIGHT PUMP!

Chemists at the Bureau of Industrial Hygiene, Connecticut State Department of Health, are interested in finding a portable, light-weight, compact, motor-driven suction pump. A pump is wanted that can be handled conveniently by one person taking air samples in the field for later laboratory analysis. It must be capable of drawing at least 2 cubic feet of air per minute at 50 inches of water vacuum. The pump assembly in use at the present time weighs approximately 60 pounds. A unit weighing not more than 25 pounds would be far more satisfactory for field use.

Attempts to develop light-weight air-sampling equipment having the desired rating have not been successful. The ¼ horsepower electrical motor necessary to drive an available rotary pump (weight 4.5 pounds) adds prohibitive weight to the apparatus. Light-weight, high-speed motors (1/10 horsepower and 10,000 revolutions per minute) have not been adapted successfully.

The Connecticut Bureau would welcome any suggestions about motors adaptable for this use. It would like to know how other units are meeting the problem of field air sampling equipment for use with filter papers and impingers.

Please address correspondence to Connecticut State Department of Health, Bureau of Industrial Hygiene, 1179 Main Street, Hartford 1, Conn.

McGILL RESIGNS FROM USPHS

Dr. Charles M. McGill, formerly director of the Industrial Hygiene Section, Oregon State Board of Health, has resigned from the USPHS, effective January 28, 1948. His work with the Oregon State Board of Health began in 1945 and was terminated September 30, 1947. Dr. McGill came into the USPHS in 1935. He spent several years in the district offices and during the war was on loan to the United States Maritime Commission. Dr. McGill has taken a position with the Tacoma Smelter in Tacoma, Wash.

INDUSTRIAL ORAL HEALTH

Vernon J. Forney,

Dental Surgeon, USPHS

II. ADEQUATE RECORDS

Standard record forms are needed in the operation of industrial oral health programs to facilitate uniform collection of base-line data. These data are necessary for several important reasons; namely, for use in appraisal of oral health programs: for information regarding oral disease prevalence; for correlation with other data collected in the course of medical, chemical, and engineering studies; for cost analysis of treatment service; and for development of better data through accurate recording of all clinical oral findings as well as operative procedures.

The purpose of having a standard record form is to unify collection of information which will serve as a base line in planning the scope of treatment service and, too, as a starting point in measuring the effectiveness of an industrial oral-health program before and after utilization of preventive practices. Analysis of preplacement oral-examination data will show the amount of dental service required to raise the oral-health status of those persons comprising an industrial population.

An accurate record of the oral-health status of each new employee is very important. Both normal and abnormal conditions observed in a new employee must be recorded. Knowledge of the employee's oral-health status at the start of employment is necessary if changes which may occur during employment are to be recognized. Oral changes can be recognized readily and steps taken to correct the condition. Concurrently, with diagnosis and treatment, a search of the occupational environment should take place to determine the presence of the exposure factor or factors responsible for these occupational oral-disease manifestations. The efficiency of preventive procedures adopted for control of environmental factors contributing to oral disease can be evaluated only if preplacement and periodic oral-examination data are recorded and compared.

Standard oral-record forms provide a

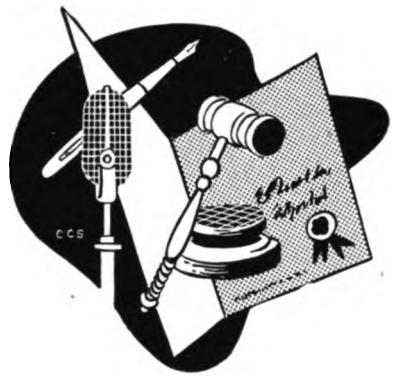
(Continued on page 4)

ORAL HEALTH

(*Continued from page 3*)

source of information regarding prevalence and incidence of oral diseases whether they are of occupational or nonoccupational origin. Early recognition of oral manifestations of occupational disease has in many instances brought about initiation of control measures before any disabling effects of exposure have occurred.

Cost analysis data of industrial oral-health programs now in operation are needed to strengthen promotion and development of new programs. Industrial management and other groups who are responsible for financial planning of industrial oral-health programs are interested in per capita costs relative to the return which they may expect for their investment in the program. It is reasonable to assume that these groups may expect a "dollar-and-cents" return, but at present there is no method of determining the monetary value of this health service. Sickness absenteeism rates for oral disease may be approaching a solution to the problem, but too little factual data are available at present to substantiate oral disease as a contributing factor in sickness absenteeism among industrial populations.



Development of a standard oral-record form for use in industrial oral-health programs must be done by persons who are cognizant of the essential items required in a record of this type. It is known that many oral-record forms are used by dentists in industry, but these oral records vary in content to such a degree that an over-all statistical analysis is difficult. Uniform recording would eliminate this hurdle. An oral-record form is being developed by the Industrial Hygiene Division in cooperation with the American Association of Industrial Dentists. This form will include the permanent oral-health record, but will be designed to serve other functions as well.

Changes and additional activities in the Industrial Hygiene Division, USPHS, have necessitated certain administrative shifts in the organization. The new chart, reproduced here, is self-explanatory.

FEDERAL SECURITY AGENCY
U. S. PUBLIC HEALTH SERVICE

ORGANIZATION CHART

INDUSTRIAL HYGIENE DIVISION

BUREAU OF STATE SERVICES

OFFICE OF CHIEF

J. G. TOWNSEND, Chief
J. W. JUSTICE, Admin. Asst.
J. J. BLOOMFIELD, Asst. Chief
in charge - STATE AID SERVICES
W. M. GAFAFER, Staff Consultant

DISTRICT CONSULTANTS

ADVISORY COMMITTEE AND TECHNICAL CONSULTANTS

Industrial Health Information

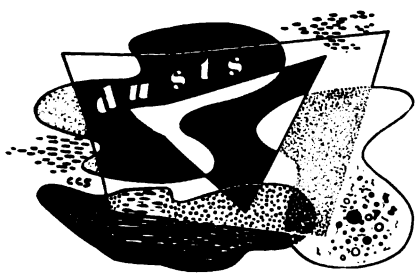
Industrial Welfare Services

SECTIONS

MEDICAL	DERMATOLOGY	ENGINEERING	LABORATORY	STATISTICAL	NURSING	DENTAL
H. T. CASTBERG Chief	P. C. CAMPBELL, JR. Chief	C. M. BERRY Chief	L. T. FAIRHALL, Chief UNITS Toxicological Analytical Radiant Energy	W. M. GAFAFER Chief	F. R. KAHL Chief	V. J. FORNEY Chief

AIR POLLUTION EXPERTS TALK AT ATLANTIC CITY

Arthur C. Stern, Engineer, Division of Industrial Hygiene and Safety Standards, New York Department of Labor, explained that New York is a hard coal city rather than a soft coal city and does not have a reputation for smoke, smog, or fog. "Though building code rules are on the books to control emission of smoke cinders and fly ash, they have not been implemented by rules for the design and installation of fuel burning equipment, nor are they enforced," Mr. Stern said. An attempt is made to enforce sanitary code provisions which declare that smoke must not be discharged to the detriment or annoyance of any person. These provisions are sometimes enforced by a "smoke squad" and sometimes through general inspection of sanitarians.



Los Angeles experiences a unique type of air contaminant which causes serious smarting of the eyes, according to Mr. Charles L. Senn, engineer-director, City Health Department, Los Angeles, Calif. The actual sources of the contaminants have not been discovered, but a project has been inaugurated for eliminating all sources of visible air pollution. Mr. Senn said, "We have not been able to identify the irritant because of the large number of complex chemicals that could be produced by incomplete combustion of petroleum products. The effect of hydrolysis, oxidation, catalytic action of sunlight and other factors must be considered." Experience in Los Angeles indicates that the health department, engineering and industrial hygiene bureaus form a logical team for air pollution control.

The question of air pollution is divided into two parts, smoke and dust, in the opinion of Sumner B. Ely, superintendent, Bureau of Smoke Prevention, Pittsburgh, Pa. Mr. Ely says, "We have cleared 1,500 smoking stacks in Pittsburgh in the last 4 years, and we believe that visibility has improved."

Mr. Ely is convinced that weather is the most important factor in dust and dust problems. A test run in February 1946 when steel mills were shut down, showed that the number of mills running does not determine the dust fall. Weather inversion seems to be responsible. When the earth is warmer than the air the atmosphere rises and carries the pollution upward. When the earth is colder than the air, a meteorological lid holds pollution down.

Cleveland has centralized its program in a new Division of Air Pollution Control, located in the Department of Public Health and Welfare. In the division are three Bureaus—Industrial Hygiene, Industrial Nuisances and Smoke Abatement. Mr. Herbert G. Dyktor, Commissioner of the division, emphasized that the program will necessitate continued public interest, as well as patience and cooperation, to succeed in clearing the atmosphere.

Mr. Dyktor bases his plan on the premise that there are two main sources of air pollution: Industrial processes, and the combustion of fuel. The Bureau of Industrial Hygiene cooperates by recommending control at the point of origin in the plants. The Bureau of Industrial Nuisances deals with not only industries but the public in general, any one who complains. The violator is consulted and a mutually satisfactory solution worked out if possible. Where an excessive smoke problem must be solved, the Bureau of Smoke Abatement works with the other two bureaus because in some cases smoke arises from both combustion and metallurgical processes. Concluding with a number of practical suggestions, Mr. Dyktor remarked that there is no magic in air pollution control, only hard work, that the program is costly, and unless the city administration is prepared to undertake it on a long-range basis, the attempt had better not be made at all.

That air pollution control is a *long* range program requiring the cooperation of all interested parties was generally agreed upon by the speakers in a panel discussion on general atmospheric pollution given in the Industrial Hygiene and Engineering Sections of the American Public Health Association meeting in Atlantic City, October 6–10.

Many cities in the United States have taken some action toward the control of air pollution during the last 5 years, but in many cases enthusiasm has waned with the realization of the immensity of the task. The need for regulations and the power to enforce them is recognized by most city governments, but the personnel and the money to carry through on such a project are often not available. In spite of these hurdles, progress was reported by speakers from New York, Cleveland, Los Angeles, and Pittsburgh.

Health Hazards in Agricultural Work Subject of Research

The recently established University of Wichita Foundation for Industrial Research is planning to study selected potentially hazardous occupations of an agricultural nature. Dust exposures which farmers, feed-mill workers, and threshers are subject to is one of the first types to be studied. An investigation of the prevalence of "grain itch" caused by a parasite may be carried on in conjunction with the dust study.

Industrialists and business men of Wichita contributed a half million dollars to set up the foundation. Laboratories and facilities for technological investigations in many fields are maintained in Science Hall, University of Wichita, Wichita, Kans. Particular attention is paid to the problems of agriculture as related to industry, and emphasis is placed upon the development and processing of natural resources and raw materials.

Edwin C. Hyatt, an industrial hygienist and research chemist on the staff, has announced that the foundation will cooperate closely with the Division of Industrial Hygiene, Kansas Board of Health.

DERMATITIS FROM PLASTICS

Donald J. Birmingham, Surgeon, USPHS

Plastics are artificial resinous compounds. They have been known to the chemical industry for almost 100 years. Their usage has become so vast that but few individuals live through a 24-hour day without coming into contact with at least one of the plastics. They have become personal accessories such as dresses, lingerie, gloves, hosiery, shoes, and cosmetics; household items such as brooms, brushes, sweepers, lamps, radios, telephones, clocks, and decorative pieces. Numerous other plastic articles which embrace even the fields of medicine, surgery, and dentistry are now available. In these fields, the new plastics are being utilized for suture materials and artificial eyes, legs, arms, and teeth.

Dermatitis occurs somewhat frequently among the workers engaged in the manufacture of plastic materials. It seldom occurs among the users of the finished plastics. The reason for the frequent incidence among the workers is because they are exposed to the basic ingredients from which plastics are made, many of which are primary irritants and/or sensitizers to the normal skin. The following are some of the many basic ingredients: phenols, aniline, aldehydes, styrene, acrylonitrile, and vinyl compounds.

The nature of plastics manufacture is such that under heat and pressure, the basic ingredients are combined by a series of chain reactions assisted by other chemicals known as catalysts. When the chemical reaction is complete, the resin is termed as being completely polymerized or completely condensed.

Polymerization means that a number of molecules of the same composition called monomers unite to form a larger molecule of the same composition called a polymer.

Condensation means that a number of molecules not necessarily of similar composition unite to form a molecule dissimilar in composition to the components, some compounds being liberated.

So long as the basic materials remain in an incompletely combined state, the skin irritant properties of the chemicals are still present. It can be generally stated that the irritant properties are inversely proportional to the stage of the cure of the resin. In other words, the more completely the resin nears its end stage, the less harmful it will be to the human skin. This offers the explanation for the fact that the finished plastics seldom cause dermatitis among their users. When a marketed plastic causes dermatitis, it is usually because the resin has not reached a completely cured or finished stage and some of the irritant component chemicals are still present.

Hazards in Manufacture

Plastics are usually produced in three forms:

1. The solid type which can be cut or has been cast in the desired shape.
2. The powdered types which are later fabricated into the desired products by molding methods.
3. The liquid types which are soluble in certain solvents and are designed for use as paints, varnishes, and lacquers.

All three types may be prepared by similar chemical methods but may represent different stages of cure. The preparation of these plastics may require the handling of the component chemicals, catalysts, and plasticizers, which can act as primary irritants and/or sensitizers to the normal skin. Usually most plastic manufacturing processes are conducted under closed systems; however, fumes and dusts or irritant compounds such as phenol or formaldehyde can escape and thereby become a dermatitis hazard.

Molding powders are formed by grinding and drying the unfinished resin. Uncombined irritants may be present in sufficient quantity to exert varying degrees of irritation of the normal skin. Workers who mix, grind, pack, and mold the powders are frequently affected with dermatitis from the ingredients, the most common offender being formaldehyde.

Liquid plastics contained in a variety of solvents can be a skin hazard because of the skin irritant properties of the unfinished plastic as well as the solvent in which it is contained.

In a study of 41,000 cases of occupational dermatitis, approximately 1 percent of the cases occurred among workers handling the synthetic resins. Dermatitis has been noted to occur among the plastic workers where the dust and fume concentrations of the manufacturing materials were high. In such plants as many as 10 percent of the exposed workers may develop occupational dermatitis. The eruption usually occurs on the exposed surfaces of the body such as the wrists, hands, face, and neck. Friction sites such as the collar line, belt line, and shoe-top line are favorite sites to become affected. At times the covered surfaces of the body are affected when the clothing becomes impregnated with the chemicals used in the manufacturing process.

PREVENTION:

1. Institute closed processes wherever possible in the chemical process.
2. Install proper ventilating equipment to remove the excess dusts and fumes.
3. Provide adequate washing facilities so that the workers are able to wash during the course of the workday as well as before leaving the plant at the end of the work shift.
4. Provide the workmen with impervious protective clothing—this to include coveralls, gloves, and sleeves designed to fit over the cuff of the glove and prevent the entrance of chemicals via the glove cuff.
5. Avoid the use of harsh industrial cleansers in the washrooms.
6. Educate the workers as to the skin hazards of their jobs.

Hazards Among the Users of Plastics

Most outbreaks of dermatitis among the consumer public are due to contact with insufficiently cured plastic. There is no way that the purchaser can be expected to know whether a plastic will cause dermatitis. When an eruption of the skin occurs subsequent to contact with a plastic material, the individual

INDUSTRIAL TOXICOLOGY

Lawrence T. Fairhall, USPHS

PENTACHLOROPHENOL

Owing to its toxicity to fungi, bacteria, yeasts, and other micro-organisms, pentachlorophenol has received wide application in the field of industrial preservation. Its high degree of toxicity to different types of organisms, its low solubility in water, and low vapor pressure (which insures permanence), its good chemical stability, and its relatively low cost have made it particularly important for industrial use.

Pentachlorophenol, C_6Cl_5OH, is but very slightly soluble in water (0.018 gram per liter at 27° C.), boils at 309°–310° C. with some decomposition, and has a low vapor pressure at ordinary temperatures.[1] At 20° C. the vapor pressure is 1.7×10^{-4} mm. of Hg and at 50° C. is only 3.1×10^{-3} mm. of Hg. The sodium salt of pentachlorophenol, commercially called Dowicide G, is soluble in water (33 grams per 100 grams at 25° C.), in acetone (37 grams per 100 grams at 37° C.), and in ethyl alcohol (64 grams per 100 grams at 25° C.).

[1] Carswell, T. S., and Nason, H. K.: Properties and uses of pentachlorophenol. Ind. Eng. Chem. *30:* 622, 1938.

The smallest lethal dose of sodium pentachlorophenate in aqueous solution or in one percent sodium chloride solution when applied to the skin was found by Kehoe and his associates[2] to be 257 milligrams per kilogram expressed in terms of free pentachlorophenol. When administered by mouth the corresponding dose was found to be 218 milligrams per kilogram and when given intravenously 22 milligrams per kilogram. No indication of chronic poisoning was found. Acute and chronic poisoning of rabbits with sodium pentachlorophenate was investigated by Boyd and his associates,[3] in which the toxicity by oral, subcutaneous, and intraperitoneal routes of administration was studied. These investigators state that contact dermatitis represents the most likely industrial hazard. Skin contact over a period of 14 days with one percent solutions caused erythema, and with 1.5 percent caused microscopic evidence of skin irritation. Greater concentrations caused gross changes—edema, inflammation, and eventual "tanning." Machle and his associates[4] found that pentachlorophenol can be absorbed through the skin into the blood. Pentachlorophenol is but little likely to emit harmful vapors when cold because of its high boiling point. When heated, however, this substance gives rise to highly pungent odors and irritant fumes. Its dust is also irritating. Urinary determination of pentachlorophenol has been suggested by Machle as a means of estimating the extent of human absorption and consequently the severity of exposure to pentachlorophenol.

References

[2] Kehoe, R. A., Deichmann-Gruebler, W., and Kitzmiller, K. V.: Toxic effects upon rabbits of pentachlorophenol and sodium pentachlorophenate. J. Ind. Hyg. Toxicol. *21:* 160, 1939.

[3] Boyd, L. J., McGavack, T. H., Terranova, R., and Piccione, F. V.: Toxic effects following the cutaneous administration of sodium pentachlorophenate. N. Y. Med. Coll. and Flower Hosp. Bull. *3:* 323, 1940: McGavack, T. H., Boyd, L. J., Piccione, F. V., and Terranova, R.: Acute and chronic intoxications with sodium pentachlorophenate in rabbits. J. Ind. Hyg. Toxicol. *23:* 239, 1941.

[4] Deichmann, W., Machle, W., Kitzmiller, K. V., and Thomas, G.: Acute and chronic effects of pentachlorophenol and sodium pentachlorophenate upon experimental animals. J. Pharmacol. *76:* 104, 1942; Machle, W., Deichmann, W., and Thomas, G.: Observations on the fate of pentachlorophenol in the animal organism. J. Ind. Hyg. Toxicol. *25:* 192, 1943.

PUBLICATION

Dry Cleaning Safely with Synthetic Solvents is the subject of a new pamphlet released by the Safety Research Institute, 420 Lexington Avenue, New York 17, N. Y. Price 10 cents.

DERMATITIS—*Continued.*

should seek the services of a dermatologist and be patch tested with the suspicious article. Patch testing, however, can produce erroneous implications and for that reason should be performed only by those familiar with the technic of application and with the interpretation of results.

Dermatitis among the public has been reported from several plastic materials among which can be mentioned fabrics, artificial leather, watch straps, and nail polishes.

PREVENTION:

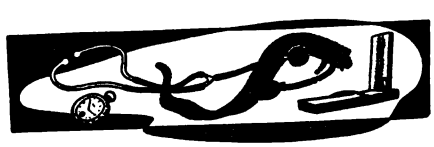
The occurrence of dermatitis among the consumer public must be safeguarded by the companies which market the plastic materials. New materials intended to be in contact with the skin, such as wearing apparel, should first be tested to be sure that mass usage will not create a widespread outbreak of dermatitis.

The Industrial Hygiene Division has advocated the *Prophetic Patch Test* for determining the dermatologic hazards associated with a certain fabric or article. Two hundred subjects who have not had contact with the test material are patch-tested with the article or fabric in question with two series of patch tests. The second series is applied 10–14 days after the first series. If one in the two series of tests shows evidence of primary irritation or sensitization of the skin as the result of the patch test, the article should not be marketed because it will probably be capable of producing dermatitis among the users.

If all of the tests are negative on both trials, the material is then subjected to an actual usage test among several thousand people in some small community.

The important points to be remembered about plastics are:

1. Some ingredients and their incomplete chemical combinations are fully capable of causing occupational dermatitis as well as outbreaks of dermatitis among the consumer public.
2. Completely finished or cured plastics rarely cause dermatitis.
3. Occupational dermatitis can be prevented in the manufacture of plastics by proper environmental and personal protective measures.
4. Manufacturers can prevent outbreaks of dermatitis among the public from plastics by completely curing the materials and by the proper use of the prophetic patch test.



New Jersey Reports Survey of Nurses

As a part of the Nation-wide survey to ascertain the number and qualifications of industrial nurses, the New Jersey Department of Health, Division of Adult and Industrial Health, made a report reprinted in part here because it is exceptionally complete in its findings and clear in its interpretations.

The survey was conducted by Agnes E. M. Anderson, Industrial Nursing Consultant for New Jersey, assisted by Mr. Jack C. Radcliffe and Dr. Marie A. Sena of the Division of Adult and Industrial Health, and Mr. Samuel Strickland, statistician, Bureau of Preventable Diseases.

Miss Anderson says of the survey: "The splendid cooperation and assistance with this survey which was given by the industrialists and their nursing personnel bears witness to their genuine interest in their responsibility—the health protection of their workers. Surveys such as this aid industry as well as this division in evaluating their health programs and problems."

The break-down of information in this report provides a guide, not only for planning a State's industrial nursing program, but for the work of the entire division. This is evident from the titles of the various tables, three of which are included here. Titles of those not included are:

TABLE IV

Number and type of personnel rendering nursing and/or first-aid services according to plant population.

TABLE V–A

Number and percent of employees to whom nursing and/or first-aid services are available according to plant population.

TABLE V–B

Number of personnel rendering nursing and/or first-aid services and ratio of employees to such personnel according to plant population.

TABLE V–C

Number and percent of employees to whom nursing and first-aid services are available according to plant population. (Trained attendants and first-aid workers not included.)

TABLE V–D

Number of personnel rendering nursing and first-aid services according to plant population and ratio of employees to person rendering such services. (Trained attendants and first-aid workers not included.)

TABLE V–E

Number and percent of employees according to plant population to whom full-time professional registered nursing service is available.

TABLE V–F

Total number of nurses according to plant population and the ratio of employees to each full-time professional registered nurse.

TABLE VI–A

Number of full-time professional registered nurses according to size of plant and county of employment.

TABLE VI–B

Number of full-time nonregistered, undergraduates and practical nurses, according to size of plant and county of employment.

TABLE I

Year	Number plants contacted	Number plants reported	Total plant population	Total professional registered nurses[1]
1945	1, 452	1, 237	674, 106	400
1947	1, 456	926	472, 479	502

[1] *The New Jersey State Board of Examiners of Nurses reported that 743 industrial nurses had registered during 1946. Marriage, retirement, or choice of some other field of nursing have been mentioned as some of the factors causing this discrepancy, as well as the limitations of our mailing list.*

TABLE II

Item	Total	Supervisors	Staff
I. Type of service engaged in at present			
Total registered nurses employed full-time by industry	511	40	471
In-plant	489	40	449
Home or visiting nurse	5		5
Industrial hospital nurse (technician)	4		4
Personnel department	4		4
Consultant or advisory nurse (V. N. A.—part-time)	9		9
II. General education of those for whom data are known			
Total nurses with the following education	511	40	471
Less than high school graduation	90	3	87
High school graduation only	287	22	265
Some college	127	14	113
1 or more academic degrees	7	1	6
III. Postgraduate professional education of those for whom data are known			
Total nurses included in 1 or more of the following groups:			
Clinical courses, total	53	10	43
Less than 1 month	6	1	5
More than 1 month but less than 3 months	47	9	38
3 months or more	50	9	41
Industrial hygiene courses, total	28	4	24
Without credit	22	5	17
With credit, total	14	4	10
Less than 1 full-time academic year	8	1	7
1 or more full-time academic years	30	4	26
Public health program of study, total	22	3	19
Less than 1 full-time academic year	8	1	7
1 or more full-time academic years			
IV. Nursing experience of those for whom data are known			
Total nurses included in one or more of the following groups:			
Industrial nursing, total	511	40	471
Less than 1 year	112	3	109
More than 1 year but less than 5 years	292	18	274
5 or more years	107	19	88
Public health nursing, total	44	2	42
Less than 1 year	1	2	1
More than 1 year but less than 5 years	36	1	35
5 or more years	7	1	6
Other fields of nursing, total	405	39	366
Less than 3 years	96	10	86
3 or more years	309	29	280

TABLE III

Item	Plant population						
	Total	Under 100	101–250	251–500	501–1,000	1,001–5,000	5,001 and over
Percent of plants reporting nursing and/or first-aid services	48.4	17.7	40.9	64.5	86.7	97.0	100.0
Percent of plants reporting no nursing and/or first-aid services	51.6	82.3	59.1	35.5	13.3	3.0	0.0

ILLUMINATION

George Clayton, USPHS

III. Brightness and its Measurement

The report numbered one of the Committee on Standards of Quantity and Quality of Interior Illumination of the Illuminating Engineering Society is an authoritative summary of many researches pertaining to brightness and brightness ratios (*1*). It reads in part:

Brightness Ratios in the Visual Field

"The effect of the brightness of a light source or of a luminous portion of a luminaire upon visibility, comfort or ease of seeing depends largely upon the ratio of that brightness to that of the background against which it is seen. Similarly, the effect of the brightness of the immediate surroundings of a visual task (such as this printed page) depends upon the ratio of the brightness of the task to that of its surroundings. Therefore, the specification of brightness ratios is a basic necessity. The results of extensive researches reveal the proper brightness ratios in the visual field where critical tasks of seeing are performed for prolonged periods. The following specifications are for relatively large areas and do not involve purely aesthetic considerations.

Best Seeing Conditions

"*The ratio of the brightness of the visual task to the brightness of its immediate surroundings is unity.* The effect of any portion of the surroundings decreases as the angular distance with the line of vision increases. There is no sharply defined boundary between the immediate surroundings and the outer peripheral visual field. However, the surroundings in this case should have a reasonable angular extent and might well be considered to extend to 30° from the line of vision in all directions.

"*The brightness ratio of a light source or luminous portion of a luminaire to its background is unity.* Obviously, when this is achieved with ceiling luminaires, in which case the ceiling is the background, indirect lighting is approached. To refine the seeing conditions still further for prolonged performance of a task of critical seeing and to meet certain other conditions, additional light can be supplied to the visual task by a non-glaring direct component of light. In small rooms where little or no appreciable area of bright ceiling is in the visual field, the necessity for an additional direct component of light becomes less, or even of little or no importance.

Good Seeing Conditions

"*The brightness ratio of the visual task to its immediate surroundings should be no greater than three.* The reverse of this condition in which the surroundings are brighter than the visual task is not included even though certain criteria might permit it. From physiological and psychological viewpoints, it is well to have the task as bright or brighter than its surroundings or any substantial area in the visual field when there is a difference in brightness between the two. Limiting the brightness of the visual task to three times that of its surroundings has adequate support in the results of researches dealing with the sensitivity of the visual sense, accuracy of work done, and ease of seeing.

"*The brightness ratio of a light source, or luminous portion of a luminaire, to its background should not be greater than three.* Inasmuch as light sources and luminaires are generally more removed from the line of vision when one is looking at the visual task, it may appear that this brightness ratio can have a greater limiting value than the brightness ratio of the visual task and its surroundings. However, inasmuch as the criteria used as the basis of this specification do not take into account all possible accumulation of the effects of prolonged seeing, it appeared desirable, for the present at least, to specify the same limiting brightness ratio as in the case of the visual task."

To make a thorough diagnosis of visibility in seeing conditions involves the following (*2*):

1. Brightness levels of the task and the immediate entire surroundings.
2. Brightness contrasts between critical details and their background.
3. Brightness ratios of the surroundings and the task.
4. Brightness and brightness ratios in the entire visual field.

High visibility, ease of seeing, and good seeing conditions are overwhelmingly the results of good brightness engineering.

INSTRUMENTS

Luckiesh-Taylor Brightness Meter

The Luckiesh-Taylor brightness meter is shown in figure 1. Through the upper eyepiece at the right-hand end,

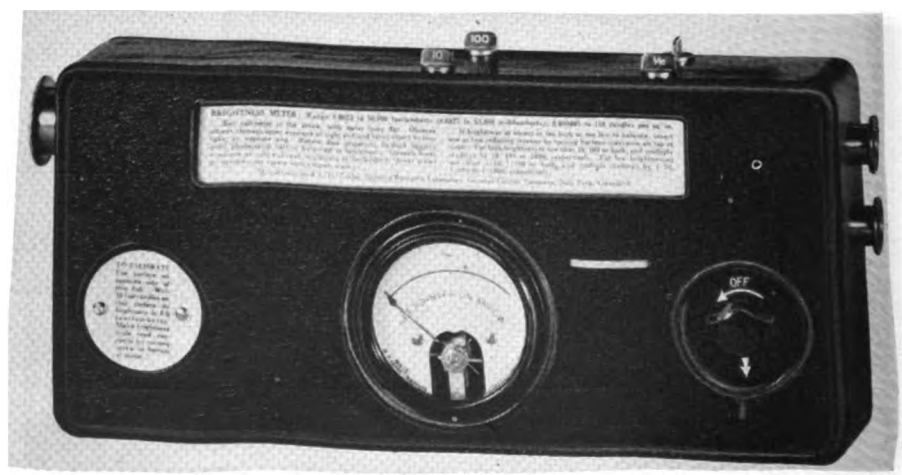
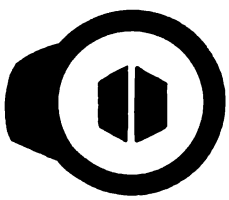


Figure 1—Luckiesh-Taylor brightness meter.

the observer sees the photometric field as illustrated in figure 2. It consists of two small aluminized trapezoids which image the comparison field. The external test field is brought into focus in the plane of the photometric field by means of the lens tube at the left-hand end of the meter. The brightness of the comparison field, the trapezoids, is adjusted by rotating a small knurled wheel projecting through the side of the case. This rotates a photographic film gradient to increase or decrease the brightness of an opal glass illuminated by a small tungsten-filament lamp. The test field, seen in the space between the trapezoids, can be matched in brightness with the adjacent trapezoids. After a photometric balance is obtained, the brightness of the test-object is read from a scale seen through and magnified by the lower eyepiece at the right-hand end. The values are given both in candles per square inch and in foot-lamberts.

Figure 2—Photometric field as seen through the Luckiesh - Taylor brightness meter.



PHOTOMETRIC FIELD

The scale of the meter reads from 0.0045 to 0.11 candle per square inch; also 2 to 50 footlamberts. Its range can be extended upwards by two multiplying screens with multiplying factors of 10 and 100, respectively. These can be used together, with a multiplying factor of 1,000. Brightnesses below the normal range of the meter may be measured by use of reducing screens with multiplying factors of 1/10 and 1/100. Used together, the factor is 1/1000. The range can be extended downward by adding denser filters but the small field which is advantageous in its normal usage becomes disadvantageous at brightnesses much below its normal range.

When any multiplying or reducing screen is in use the flat side of the button is faced toward the observer, with the multiplying factor plainly marked on it. The test object is clearly focused in the photometric field, hence there is no uncertainty as to the object being measured. The optical system is such that an object one-foot wide and several feet long can be measured at a distance of 500 feet.

Figure 3—Macbeth illuminometer.

Macbeth Illuminometer

The Macbeth illuminometer is shown in figure 3. There is direct reading in foot-candles for rapid measurement of illumination on a surface. Its normal range of 1 to 25 foot-candles is extended by two neutral absorbing screens to cover a range from approximately 0.02 to 1200 foot-candles. The range can be further extended by additional screens if specified when ordering the instruments (*4*).

This instrument is used not only to measure illumination on surfaces (foot-candles), but to determine brightness of illuminated surfaces or illuminating sources (candles per square foot) and candle powers of sources. When using the instrument, the individual has to sight on the test plate placed at the point where illumination is to be measured, turn a knob until concentric fields in a Lummer-Brodhun type head show equality of brightness, then read the calibrated scale. This procedure is used in determining foot-candles.

To determine brightness, procedure is the same as in measuring foot-candles except that the test plate is not used. Light is received directly from the surface or source under test. However, since the test plate is used for standardizing the instruments, allowance must be made for the reflection factor of the plate's surface.

To determine candle power of a light source the test plate is set in a plane normal to the light rays. Foot-candles read from the square, multiplied by the square of the distance from the test plate to the light source, give us the candle power of the source in that direction. As shown in figure 3 this illuminometer consists of a Lummer-Brodhun cube mounted in a rectangular head at one end of the tube which encloses the working standard plate. Turning a knob on the illuminometer moves the lamp back and forth in the tube so that it can be adjusted to balance the light emitted from the source under observation. Current in the lamp is set and held at a predetermined value indicated on a milliammeter supplied as part of the equipment.

References

(*1*) Recommended Practice of Office Lighting, Illuminating Engineering, 42: 673 (July) 1947.

(*2*) Matthew Luckiesh, Brightness Engineering. Illuminating Engineering, 39: 75–92 (Feb.) 1944.

(*3*) A. H. Taylor, Brightness and Brightness Meters. Illuminating Engineering, 37: 19–30 (Jan.) 1942.

(*4*) Leeds and Northrup, E–72.

ARKANSAS

Nurses' Seminar—An industrial hygiene nurses' seminar was conducted at the Little Rock City Health Department from September 22 through the 26th. This seminar was sponsored by the Little Rock City Health Department and the State Health Department, Division of Industrial Hygiene.

Lecturers at this meeting included Miss Ruth Kahl, Industrial Hygiene Nursing Consultant, U. S. Public Health Service; Mr. Riddick Riffel, Workmen's Compensation Commissioner; Dr. A. C. Curtis, Director, Division of Tuberculosis Control of the State Health Department; and William A. McQuary, Director, Division of Industrial Hygiene.

Dr. Walter E. Doyle, Industrial Hygiene Consultant, was unable to attend but sent a paper which was read at this meeting.

Nurses attending the seminar were from the Little Rock City Health Department, the Visiting Nurses' Association, and various industries. Considerable interest was expressed by the nurses attending this meeting.

CALIFORNIA

Conjunctivitis—An increasing number of contagious conjunctivitis cases were reported in the southern part of the State, which concerned all three industrial hygiene units, Los Angeles City, Los Angeles County, and the State Department of Health. A program and plan of operation to control the epidemic was developed.

Occupational disease reports received by the Bureau of Adult Health, California Department of Public Health were sorted for possible epidemic conjunctivitis cases for the month of July and the first part of August. These were utilized in personal plant visits as an effective means for opening a discussion of possible cases. The doctors were both interested and cooperative. As a result of interviewing local eye specialists and other doctors, 39 diagnosed cases of "epidemic," "kerato," or "infectious" conjunctivitis, and 22 probable cases in 27 plants were found in the area above mentioned. A few scattered cases were reported from the remainder of the State. In addition, 11 plants in the area had at least 12 possible cases and concerning 6 others there were rather vague reports. By August 8, however, no new cases had been seen by any doctors reached during the investigation and it appeared that the outbreak had been controlled. It was arranged however, to continue an epidemiological study and an educational program by the nurses in the various factories.

IOWA

TB Program—In the Iowa miniature film program for industries, approximately 45,000 employees were surveyed by September 1, 1947. The program is of a highly cooperative nature. It is conducted under the joint sponsorship of the Iowa Tuberculosis Association and the State Department of Health. The Division of Industrial Hygiene promotes the program among industries, and the Division of Tuberculosis Control takes, processes, reads, and reports the findings of the pictures, including the full-size follow-up plates. Local sponsoring agencies, such as County TB Associations, Junior Chambers of Commerce, or other community organizations, work out local arrangements and details of scheduling.

Each person receives a preliminary report, but the final reports are forwarded only to physicians. Each person must name his family physician on the identification card, and final reports of abnormal conditions are forwarded to this physician, who advises, treats, and instructs the individual. The plant physician receives a report on persons in his plant who exhibit abnormal findings.

MASSACHUSETTS

Speeches—Two members of the staff were contributors to the Sixth Saranac Symposium on beryllium held September 29 to October 3, 1947. Dr. Harriet L. Hardy spoke on the clinical and epidemiological aspects of the chronic or delayed disease, while Dr. Hervey B. Elkins discussed chemical methods for the determination of beryllium.

Publication—"Possibility of Chronic Cadmium Poisoning" by Dr. Harriet L. Hardy and John B. Skinner, physician and director, respectively, of this division, appeared in the *Journal of Industrial Hygiene and Toxicology* for September 1947. Urinary and atmospheric findings are recorded as well as actual case histories and citations from the literature on this too-little-known occupational entity.

NEW HAMPSHIRE

New England Conference—Ten New Hampshire nurses attended the thirty-second annual conference of the New England Industrial Nurses Association, held in New Bedford, Mass., October 4 and 5.

For the opening session, the large group of nurses were guests of the Pepperell Manufacturing Co. A trip through the modern medical department, and lunch in the plant cafeteria were followed by speeches by Russell H. Leonard, president of the Pepperell Manufacturing Co. and Dr. Karl Reiland, medical director.

Both of these men paid high tribute to the work of the industrial nurses. Dr. Reiland reviewed the progress made in this field during the last 30 years.

Following the banquet at the New Bedford Hotel, Dr. Henry H. Ritter, professor of clinical surgery at New York Post-Graduate Medical School, gave the principal talk. Dr. Ritter emphasized the importance of careful first-aid treatment, pointing out that the industrial nurse in charge of a first-aid case may be responsible for the future earning power of the employee she treats in an emergency, and must therefore use her ability and judgment to the fullest.

NEW YORK

Air Pollution Studies—The City of Niagara Falls requested assistance in the preparation of a city ordinance and charter amendment to set up the necessary regulations for the control of atmospheric pollution. As the first step in aiding Niagara Falls, a brief engineering survey was made by our engineering unit of the over-all atmospheric problem in the city, and a report was prepared and sent to the City Manager, roughly outlining the approach to the control problem. After this report had been studied, we were requested to aid in the drafting of the detailed ordinance and charter amendment. At the conclusion of a series of conferences, the ordinance was adopted.

This ordinance is unique in that it is, to our knowledge, the only ordinance in any city in the United States providing complete coverage for all types of atmospheric pollution: dusts, gases, fumes, mists, vapors, smokes, and odors. It is further unique in that it sets up an air pollution control board with rule-making and administrative powers so that rules adopted for the control of atmospheric pollution may be kept flexible. These rules have yet to be written, and this division has been asked to cooperate in their preparation.

PENNSYLVANIA

Conference—Dr. E. R. Aston, Dental Consultant for the Bureau, is a member of the committee which laid plans for the annual conference of the five industrial hygiene groups to be held in Boston next March. The committee met recently in that city. Dr. Aston represented the American Association of Industrial Dentists and will arrange the scientific program to be presented before this dental group at the March meeting.

Electrocardiograph—The bureau has recently received an electrocardiograph as an addition to its medical equipment. This apparatus will be used as a further diagnostic aid after X-ray surveys of industrial workers have indicated the possibility of cardiac involvement. The equipment will be operated by one of the bureau's industrial hygiene physicians.

Personnel—Miss Ellenor A. Williams, R.N., has joined the staff of the bureau as industrial nutritionist. Miss Williams holds a bachelor of science degree in nursing from the University of Pittsburgh and has done considerable work toward a master's degree. For the past 3 years she has been an instructor in the School of Nursing at the University of Pittsburgh.

TEXAS

University Course—Plans are now under way in Houston to set up a 4-year university course for industrial hygienists. Representatives of the University of Houston and the city of Houston health department have been working on the 4-year program for several months and the course should be ready to offer by mid-term.

The 4-year course will be available to undergraduates and has been designed to include the study of industrial hygiene problems common to this section of the United States. Required courses will include physics, chemistry, principles of sociology, dermatology, toxicology with laboratory experience, safety problems in industry, and economics. An internship will be offered at the end of the third year. Mr. Harvey R. Mobley was a member of the committee that worked on the curriculum during the summer.

Ice Plants—Houston's 21 ice plants came in for their share of industrial hygiene service during the summer months with a special survey completed in August by Mr. Harvey R. Mobley, Industrial Hygienist, Houston City Health Department.

Mr. Mobley had special conferences regarding his inspection findings with the plant owners and managers, and also took ice specimens for bacteriological analysis. Recommendations regarding the 21 plants included everything from proper disposal of waste water to projecting precoolers which were open and subject to contamination. Hazards found in several plants included high humidity, ammonia vapors, and possibility of dermatitis. Instructions as to means of controlling these exposures were given and necessary corrections by plant owners are being made.

Nurse Students Get Experience in Industry [1]

To meet the need for better preparation of industrial nurses, the University of Washington, in cooperation with the Industrial and Adult Hygiene Section of Washington State Department of Health, has developed a curriculum for graduate nurses which gives a bachelor of science in nursing with a major in industrial nursing.

The field practice for the course of study will be provided in various industries in the State. The Industrial Advisory Nurse, Industrial and Adult Hygiene Section, selects the industries and directly supervises the students' experience. The first student began her field work in September and the second student in October.

When considering a plant for the field practice, it is necessary to secure the willingness of the professional personnel of the medical department to participate and permission from management. After this preliminary agreement has been reached, a conference is then arranged for the following people: Top management, the industrial medical director, the nurse-in-charge, the director of field work, University of Washington, and the industrial advisory nurse. In this meeting the objectives of and the policies governing the field work experience are carefully reviewed. Policies that govern the field work require agreement of all parties concerned. For example, the status of the student in the plant must be carefully understood, and the responsibilities of both the university and the industry must be definitely stated. The main objectives of the field work are enumerated as follows:

1. To give the student practice in procedures required of an industrial nurse.

2. To give the student an appreciation of the concept of individual health work in relation to the worker's environment and the family unit. (To give the student an understanding of all that is special about the industry.)

(Continued on page 15)

[1] Washington University is one of several institutions that offers a program of study which includes field practice for industrial nurses. Articles concerning other courses are welcome.—Managing Editor.

NEW MATERIALS AND PROCESSES REQUIRE MEDICAL VIGILANCE

"Health problems associated with the newer technology have been most prominent ever since the news of the atom bomb was released," said Dr. R. Emmet Kelly, Assistant in Medicine, St. Louis University School of Medicine, in the opening statement of his talk at the APHA meeting in Atlantic City.

Radioactive materials are inherently hazardous, but they can be handled safely, Dr. Kelly said, proving his point with this illustration: "On August 2, 1946, the first shipment of radioactive isotopes produced in the chain reacting pile at the Clinton Laboratories at Oak Ridge, Tenn., was made to the Barnard Free Skin and Cancer Hospital in St. Louis. During the following year over 1,000 shipments were made throughout the continental United States and the Territory of Hawaii. The shipments approximated 1,500,000 miles, and were sent to about 150 scientific and research institutions. These isotopes are being used in fundamental research, in medical research and treatment, in cancer study and treatment, in biological research and in industrial research. Radioactive isotopes are used in oil well logging, in metallurgy, in aircraft engine development and in structural analysis of heavy objects, such as casting and girders. In agriculture, tracer elements are used to study soil chemistry, plant hormones, photosynthesis, and the entomological aspect of farming."

SHIPPING

Extreme care has been taken in the production, transportation, and use of these isotopes to protect the personnel. Dr. Kelly explained that shipping containers may vary from less than a pound to a ton. In one case a 23-gram unit (approximately the weight of a half-dollar) containing radioactive cobalt (Co^{60}) was shipped in a container weighing 1,600 pounds.

Future health problems in this field are classified by Dr. Kelly in three groups: accidents and their prevention, unfamiliarity or insufficient knowledge of how to handle these materials, and that of chronic low-level exposure. The serious character of the disposal problem becomes evident when one considers the sum total of all the radioactive isotopes used over the entire country. The answer to this problem is not known.

INDUSTRIAL USE

In the industrial chemical field, expansion is so rapid that one company alone developed 50 new products in 1 year. Dr. Kelly said that the problem for a manufacturing concern is to make certain that no product is used in a manner in which systemic toxicity or skin irritation might result to its workers or consumers. For example, every new textile chemical, such as the melamine resins, is subjected to a laboratory study for systemic and skin reaction, culminating in patch testing on 200 human subjects. In plastics and plasticizers, animal experimentation, involving in some cases 2-year feeding tests, must be made before they can be marketed.

In discussing the toxicology of the newer metals, Dr. Kelly pointed out that very little is known about some of these substances; namely, beryllium, cadmium, tellurium, uranium, and vanadium.

"High-frequency radiations had been known prior to 1939," said Dr. Kelly, "but their wartime use in radar vastly stimulated their use and development. These high-frequency radiations are the basis of the electronic field and have wide industrial application. It is important that their effect on the workers be determined." Dr. Kelly told of two groups of men who were exposed while operating radar, and there were no abnormal clinical or laboratory findings and no effect on the blood-forming or reproductive systems was found.

Concluding with a brief discussion of ultrasonic waves, Dr. Kelly noted "that since 1928 ultrasound has been shown to have destructive capabilities for biological tissue. The indications are that the danger limits will turn out to be very high and probably will be encountered only under special conditions."

Protection Measures for Radioactive Dust Hazard

In the case of x-radiation, careful studies have been made of beam patterns, attenuation, and absorption to determine standards for protection in industrial plants, hospitals, and research laboratories. (See, for example, the recent article, Protection against X-Radiation, Technical News Bulletin, National Bureau of Standards, vol. 31. pp. 89–92, 1947.)

Precautionary measures for those radioactive salts, which have come into wider use only recently are still in a stage of active evolution. The use of film badges has been discussed in August and October 1946 issues of this NEWSLETTER, but another factor of great importance, the hazard of radioactive dust, requires particular attention. It is a common effect when shaking soap powder into a dishpan to experience the acrid sensation of soap in the throat and nose, even though a visible cloud of powder may be absent. This is due to the small amount of dust which reaches the region of the face and is inhaled through mouth and nose. Workers with radioactive salts in scientific laboratories may weigh out portions of such chemicals to determine effects quantitatively. In so doing, while they may be protected adequately against rays by screening materials, they may not take sufficient precautions against the less obvious dust hazard.

It is advisable to use an adequately ventilated hood where possible, but where certain types of routine operations make this difficult or impossible, the following suggestions are made. A mask approved for protection against toxic dusts should be used to prevent the inhalation of radioactive dusts into the lungs where they may go into solution, diffuse into the blood stream, and so be carried to all parts of the body. If they are not readily eliminated from the body, prolonged intimate contact with the living cells and tissues may make up for lack of intensity in producing a damaging effect.

Another portal of entry which should not be neglected is the skin of the face, neck, and arms, particularly in warm weather, when the radioactive salt dust may dissolve in the perspiration, and

be absorbed partially into the body. The hair should be protected with a cap. It is advisable after handling the salts to wash carefully all exposed portions of the skin, or perhaps, as a still greater precaution, to use the shower and to wear special clothing during these operations. An acceptable design would be the type of gown and cap worn during surgical operations, which may be washed readily afterwards.—**Herbert Shapiro, Special Research Fellow, Laboratory of Physical Biology National Institute of Health, USPHS.**

NURSE TRAINING

(Continued from page 13)

3. To give the student an opportunity to assist in program planning.

4. To provide an understanding of the health services in industry as an integral part of community health services.

5. To provide an opportunity for an understanding of the variations in the types and development of health programs in industry.

A manual containing all the material pertinent to the field work has been prepared. Included are policies and objectives of the field practice, students' application blanks, instructions relative to students' responsibilities, work hours, uniforms, reports (daily, monthly, and final), the plant nurse's responsibilities in guiding the student's experience, and the evaluation forms for the student's work.

The total period for the field work experience is 11 weeks. The plant or plants selected for the student will depend upon her past experience, her interest, and her need. Some students will be given an experience in several plants of various sizes while others may spend more time in a large or small industry. Each student will be given an opportunity to participate in an experience where there is a full-time medical director, a part-time medical director, and a physician on call.

The personnel in industries who have been asked to participate in this experience have all exhibited interest and eagerness to take part. They recognize the additional work involved but also perceive the value of the stimulation which a student program provides.—**Gladys A. Jahncke, Nursing Consultant, Washington, State Department of Health.**

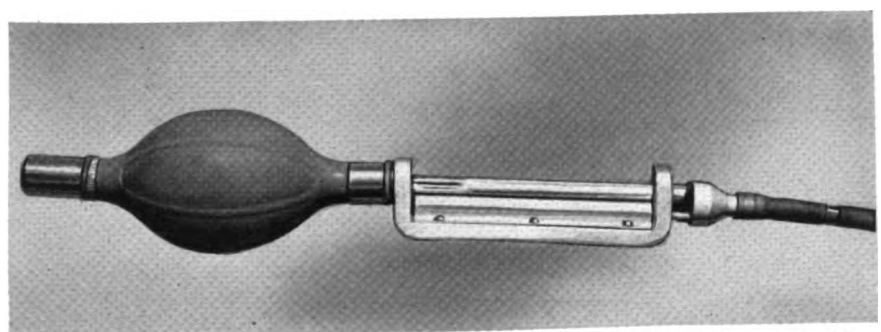
COLORIMETRIC CO INDICATOR

The Mine Safety Appliance hydrogen sulfide or hydrogen cyanide detector may be used with the National Bureau of Standard's colorimetric carbon monoxide indicator tubes for rapid and convenient determinations of carbon monoxide concentrations. (See National Bureau of Standards preliminary report on colorimetric method for rapid determination of carbon monoxide in air.)

The NBS CO indicator tube contains white and blue solids which absorb substances such as water vapor and gasoline fumes. They also contain a sensitive yellow chemical which turns green when exposed to CO. Carbon monoxide concentrations can be determined by comparing the green color developed with an NBS color chart. These chart colors correspond to the color developed in the NBS indicating tubes which have been exposed to the specified concentrations of CO by passing specific volumes of the sample through the tubes at a rate of 1.5 ml. per second. For the apparatus developed by the National Bureau of Standards, one bulb full of air or "one squeeze" is equal to 54 ml.

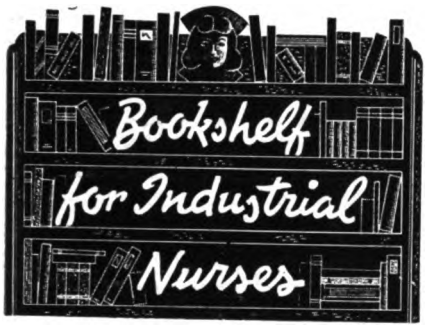
In using the MSA detector, the rate of 1.5 millimeters per second can be secured by using a glass capillary, or orifice calibrated for this rate. This calibration and the volume of the MSA bulb can be determined by using a stopwatch and measuring the volume of air displaced by squeezing the bulb. The volume of air in the glass orifice, rubber tube, and that portion of the apparatus connecting the orifice to the indicator tube should be subtracted from the bulb volume. This volume correction can be determined by measuring the volume of water required to fill this portion of the assembled apparatus.

The figure shows the assembly with the calibrated glass orifice on the right connected by a section of rubber tubing. The small section of rubber tubing at the extreme right has been placed over the glass orifice to afford protection from breakage.—**H. C. Clare, Idaho.**



The hydrogen sulfide or hydrogen cyanide detector (MSA) may be used with a calibrated orifice and National Bureau of Standards carbon monoxide indicator tubes in rapidly and conveniently determining CO concentrations.

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.



PITHEAD NURSE. Nursing Times, Journal of Royal College of Nursing Vol. 43, No. 24, June 28, 1947.

The industrial nursing program in a coal mine in England is vividly portrayed. The medical department is large, well-equipped and has one corner set aside for eye injuries only. Miss Drury, the industrial nurse, works under medical direction and has two male assistants under her supervision. Most of the nursing care is given in the medical department but at times the nurse and her assistants "go down the shaft" to give care to the injured miners.

In addition to her generalized nursing training, Miss Drury has had a course in venereal diseases and has her industrial nursing certificate from Royal College of Nursing.

VENEREAL DISEASE EDUCATION. Terrence E. Billings, Surgeon, USPHS. Journal of Venereal Disease Information, Vol. 28, No. 8, pp. 162–163, August 1947. For sale by Superintendent of Documents, Washington 25, D. C. Price 10 cents.

To attain effective results from public health educational materials for use in the venereal disease program, the author believes that all such material should be presented in simple, easily grasped language and with a positive approach. He suggests the comic book or comic strip as an excellent method of reaching the group of people that needs such information. It would supplement other mediums, such as magazines, motion pictures and lectures, and could be portrayed in a dignified as well as interesting manner.

COSMETICS AND DERMATITIS. Louis Schwartz, M. D. and Samuel M. Peck, M. D. Paul B. Hoeber, Inc. Medical Book Department of Harper & Brothers, New York and London, 1947.

As the title indicates, this book describes, briefly and clearly, the substances in various cosmetics that may cause dermatitis. From it the nurse in industry may gain an awareness of some of the possible causes of skin irritations.

HOW TO SAY "YOU HAVE TB." John C. Ham, M. D. Bulletin of National TB Association, Vol. 33, No. 8, September 1947.

The author reviews the main principles that should be applied when telling a patient he has tuberculosis: (1) The patient's temperament should be considered in order to decide who should be told—the patient, a member of his family, or both; (2) to overcome any erroneous ideas pertaining to tuberculosis factual information should be given concerning the disease, its treatment and an estimate of the probable minimum period of sanatorium care; and (3) to gain the patient's confidence and to impress the need for his cooperation, the doctor should be unhurried, moderately optimistic and straightforward, as well as positive in his approach.

These cardinal points to a large degree should be employed when any diagnosis is to be presented. They may also be put into practice when a nurse finds it necessary to discuss a serious illness with a patient or the family.

This magazine may be obtained from most local libraries, health departments, and tuberculosis associations.

TUBERCULOSIS IN INDUSTRY. Herman E. Hilleboe, M. D. Journal Missouri State Medical Association, December 1945, pp. 769–771 (reprint).

This article gives information relating to the exective control of tuberculosis in industry. The objectives of the Tuberculosis Control Division, USPHS, are stated to be as follows: (1) Case finding, (2) isolation and treatment, (3) aftercare and rehabilitation, and (4) protection of the family of the tuberculous person against economic distress. Auxiliary methods of control include research, health education, and the establishment of clinic facilities.

Three definite recommendations conforming to these objectives are offered for effective effort in the control of tuberculosis in industry: (1) Establish an equitable labor policy for dealing with the problem of tuberculous workers, (2) plan a specific program for the rehabilitation of tuberculous workers, and (3) plan a program of community participation in helping workers.

Because tuberculosis is a social and economic as well as a medical problem, the author states that the whole community must be drawn into any really successful program. He says there is no greater opportunity than this for protecting the health of America's manpower.

TUBERCULOSIS CONTROL IN INDUSTRY. Herman E. Hilleboe, M. D. and David M. Gould, M. D. Diseases of the Chest. Vol. 11, No. 3. May-June 1945 (reprint).

The authors cite factors leading to the incidence of tuberculosis in industry. These involve (1) high concentrations of tubercle bacilli due to industrial and urban crowding, and (2) the lowered resistance of the individual due to subsidiary social and economic factors. They suggest that these may be partially controlled by improvements in community and industrial environments and by raising the standard of living. However, the spread of tuberculosis cannot be successfully prevented unless continuous use is made of X-rays for its detection.

Statistics are included to show the significance of this measure which also has aided in bringing to light non-tuberculous conditions of the lungs. Special treatment of cases by a chest physician is thought to be of much value.

In conclusion there is a brief paragraph on the employability of the inactive tuberculous case, when properly placed and under medical supervision.

Season's Greetings from the Industrial Hygiene Division, U. S. Public Health Service

U. S. GOVERNMENT PRINTING OFFICE: 1947