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CARBON TETRACHLORIDE POISONING IN PARACHUTE FACTORY

The cause of illness among 135 employees in a Kentucky plant manufacturing parachutes was traced to carbon tetrachloride used for cleaning soiled spots on the chutes, on investigation by the Kentucky State Division of Industrial Hygiene. The outbreak of illness occurred during a period of 10 days, and was manifested by abdominal cramping, nausea and vomiting. Some individuals complained of "bloating and difficulty in breathing." Many employees were acutely ill and unable to continue work. The illness lasted from 2 to 5 days in the average case although a number of workers continued to feel bad after resuming work.

The possibilities of food poisoning were ruled out by questioning of ill employees about food consumed in the 48 hours preceding onset of illness. The absence of fever and diarrhea indicated that the disease was not an intestinal disorder of bacillary origin.

On further study, the nursing records revealed that a great many employees complained of frequent or even constant headaches, and complaints of gastric distress had been especially numerous for several weeks.

The fact that the incidence of the disease was restricted to workers on the first shift, and to those whose work placed them in the same environment, pointed to some special factor such as a toxic chemical.

A check of the records revealed that out of 137 sick employees, 135 had been engaged in sewing and cleaning the nylon used in manufacture.

It was found that more cleaning of the chutes had been done in recent weeks and that at times "pure carbon tetrachloride" had been used in place of the usual solvent. The solvent was used freely from open containers, and an estimated 4 gallons of this solvent were used daily.

With the beginning of the cold weather season 5 or 6 weeks ago, ventilation was provided only by opening windows along the skylight, side windows being closed. Since the fumes of carbon tetrachloride gas have a density 5.3 times that of air, they could only be removed by vents at floor level. It was significant that the first noted symptoms began only a few weeks ago coincidental with the beginning

of heating, and consequent reduction of ventilation in an effort to conserve fuel.

The recommendation made for substitution of some other solvent was quickly adopted. The use of carbon tetrachloride was immediately ordered discontinued, and cleaning of parachutes is now being done with mild soap and water.

"FUMES FELL 38 WORKERS"

Such were the headlines in all the Boston, Massachusetts, papers on December 11, 1943, when, according to the newspaper accounts, 38 women employed at a Cambridge plant had fallen unconscious from a mysterious gas. For the moment it appeared that the Coconut Grove tragedy had been repeated on a smaller scale.

Investigation by members of the staff of the Massachusetts Division of Occupational Hygiene revealed that the "mysterious" gas was carbon monoxide and that, of the 38 workers affected, only 8 required hospitalization for a single night. There were no fatalities nor apparent sequelae. Atmospheric contamination with carbon monoxide occurred from the use of 2 brazing furnaces and a combustion chamber in which illuminating gas was reduced to a mixture of carbon dioxide 8%, carbon monoxide 12%, and nitrogen 80%. A leak was found around the sight glass of the combustion chamber, but the primary cause of the poisonings was the breakdown of a ventilating fan.

Although the plant was immediately shut down, the furnaces were run experimentally at night, and within 1 hour concentrations in excess of 100 p.p.m. were found with a temporary 16-inch fan in operation. Experimentally, 20 minutes after the fan was stopped, concentrations in the workroom reached 280 p.p.m. Steps instituted to prevent a recurrence included more adequate exhaust ventilation, a carbon monoxide alarm and segregation of the furnaces from the main workroom.

The moral of this story would seem to be that a situation involving an extremely "close call" for a sizeable group of workers might at any time be duplicated in many plants in Massachusetts and other States, and that operations such as the one in question call for more attention than they have been getting.

Manfred Bowditch, Director
Massachusetts Division of
Occupational Hygiene

NEW REHABILITATION PROGRAM

The Federal Security Agency announces the establishment of an enlarged program of vocational rehabilitation of handicapped persons to be administered by the Office of Vocational Rehabilitation, with

funds provided by the Vocational Rehabilitation Amendments of 1943.

"The scope of services available to disabled persons now and after the war has been broadened to include any services necessary to render them capable of engaging in remunerative employment or to render them more advantageously employable. These include surgical and medical care, hospitalization, therapeutic treatment, artificial appliances, vocational guidance and training, maintenance during training, and placement in employment. In contrast, the Vocational Rehabilitation Act of 1920, under which authorization the rehabilitation program has operated during the last 23 years, limited the use of Federal funds to training and furnishing of prosthetic appliances.

"Other changes made by the new Amendments concern the groups of disabled individuals to be served and the methods of financing this Federal-State program. Mentally as well as physically disabled individuals are now eligible for rehabilitation. Specific provision has been made for the rehabilitation of the blind and war disabled civilians, the latter of whom are defined to include members of the citizens defense corps, aircraft warning service, civil air patrol, and the merchant marine.

"The fiscal provisions have been liberalized, with the old limitation of 3-1/2 million dollars appropriated annually by the Federal Government for matching purposes having been removed. Grants to the States may now be based on actual requirements and the amount of State funds available for matching, rather than on the basis of population as provided by the Act of 1920.

"Under the Amendments of 1943, the Federal Government will assume the entire cost of administration of State programs in contrast to the previous requirement of matching on a 50-50 basis. It will assume one half of the cost of medical examinations, surgical and therapeutic treatment, hospitalization, prosthetic appliances, transportation, occupational tools and licenses, rehabilitation training, and maintenance. The entire cost of these services will be assumed by the Federal Government in the case of war disabled civilians.

"Sole responsibility for the administration, supervision, and control of this program rests with the State Boards for Vocational Education. Where there is a State Commission or other Agency authorized to provide rehabilitation services to the blind, that Commission or Agency will administer the part of the rehabilitation program pertaining to this group."

Mr. Michael J. Shortley heads the new agency as Director of Vocational Rehabilitation. Mr. John A. Kratz, Associate Director, is transferred from the Office of Education where he directed the Division of Vocational Rehabilitation which now becomes the nucleus of the new organization. Dr. Dean A. Clark, Surgeon (R), U. S. Public Health Service, has been appointed as chief medical officer in charge of the newly established Physical Rehabilitation Section.

PNEUMONIA IN THE SHIPBUILDING INDUSTRY--
A Report from the U. S. Maritime Commission

In the 12-month period from September 1942 to September 1943, 864 patients with pneumonia were treated at the Permanente Foundation Hospital, Oakland, California. Through a health plan, this hospital furnishes complete medical care to 90,000 employees of the 4 Kaiser shipyards at Richmond, California. The diagnosis of pneumonia was substantiated in every case by a positive roentgenogram of the chest. No questionable cases of "minimal" pneumonia, "pneumonitis," or similar indefinite diagnosis were included in this series. Patients with pneumonia as a contributory diagnosis to another illness were excluded.

A study of the epidemiology of pneumonia at the shipyards indicated: (a) The annual frequency rate of pneumonia was 9.5 per 1,000 workers. There were no reliable data to indicate that the incidence of pneumonia is different among shipyard workers than it is among the general population; (b) Evidence was presented showing that the type of pneumonia which has been seen among shipyard workers was in no way different from that seen among the general population; (c) There was no indication that workers who had recently migrated to this area from other States were more susceptible to pneumonia than those who have lived in this region for a long period of time; (d) Data were presented showing that the incidence rate of pneumonia is independent of the length of employment at the shipyards; and (e) There was no relationship between the incidence of pneumonia and occupation. Statistics presented demonstrate that the incidence rate of pneumonia among the workers is independent of the type of work done.

Relationship between Incidence of Pneumonia and Occupation

<u>Occupation</u>	<u>Number Cases*</u>	<u>Number Deaths</u>	<u>Number Employed</u>	<u>Morbidity Rate per 1000</u>
Welders	159	14	15533	10.2
Shipfitters	74	11	7998	9.3
Flangers	60	6	4842	12.3
Laborers	53	5	4923	10.8
Burners	42	2	4389	9.6
Electricians	41	2	3575	11.5
Pipefitters	38	5	3117	12.2
Machinists	36	4	3153	11.4
Shipwrights	29	1	2768	10.5
Chippers	24	1	3076	7.8

* Includes only the 10 largest occupational groups

Obviously the morbidity or illness rate from pneumonia is practically the same for all crafts in shipyards. It belies the oft repeated statement that welders were more prone to get respiratory diseases than are men in other shipyard trades. As pneumonia

is commonly accepted as an index of both the seriousness and general occurrence of severe respiratory illness, it is important to the steel fabrication industry in general and especially to the ship-building industry that these figures be known.

This paper is the work of Dr. Morris F. Collen, Gerhardt L. Dybdahl, and George F. O'Brien of the Permanente Foundation Hospital, Oakland, California. It will appear in full in the January issue of the Journal of Industrial Hygiene and Toxicology. The Division of Shipyard Labor Relations, U. S. Maritime Commission, Washington, D. C., will be glad to send copies to the medical directors of all shipyards and to such others as may request them.

STATE ACTIVITIES

ALABAMA.--An institute on Industrial Nursing was held in Birmingham on December 8 and 9 under the joint auspices of the Alabama Department of Public Health, Division of Industrial Hygiene, the Birmingham Visiting Nurse Association, District #1 Alabama State Nurses Association, and the Jefferson County Health Department.

ARKANSAS.--A program of mass chest X-raying and blood serology is being arranged in the larger industrial plants of the State through the cooperation of the Divisions of Industrial Hygiene, Tuberculosis Control, and Venereal Disease Control. An additional portable X-ray unit has been ordered for use in this program. The Industrial Hygiene Committee of the Arkansas Medical Society has approved the new program.

CONNECTICUT.--The Bureau of Industrial Hygiene has prepared a pocket size, loose leaf manual describing "some of the potentially hazardous industrial operations encountered in Connecticut industry." This material, organized in outline form, was "prepared expressly for engineers and inspectors to assist them in recognizing potentially hazardous conditions during the preliminary plant survey."

ILLINOIS.--The Illinois Nurses Association has recently accepted the request of the Industrial Nurses to form an Industrial Nursing Section in the Illinois Nurses Association.

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The Division of Industrial Hygiene has developed a program for routine breath sample analyses of radium dial painters. They are being assisted in this project by the only two laboratories in the country equipped to handle these samples, namely, the Radioactivity Section, U. S. Bureau of Standards, and the Massachusetts Institute of Technology.

This test is the only available index for determining the amount of ingested radium paint in workers. A concentration of radon in the breath exceeding the equivalent of one ten-millionth of a gram of ingested radium is considered dangerous. It is recognized that by using this standard method the health of the approximately 500 radium-luminous dial painters in Illinois may be safeguarded.

In addition to these tests, the Division is continuing its periodic checks of the working environment in order to call the attention of plant managements to conditions requiring additional control measures.

INDIANA.—The Monthly Bulletin of the Indiana State Board of Health is sent to industries in the State regularly. Articles on industrial health are usually included in its contents.

MASSACHUSETTS.—Several inquiries from industries using "neoprene rubbers" have been received by the Massachusetts Division of Occupational Hygiene. The Division expects more complaints of this nature since a WPB order became effective January 1, 1944, forbidding the use of natural rubber in cements.

MISSOURI.—The Industrial Hygiene Section, Missouri Board of Health, initiated publication of the "Missouri Industrial Health Bulletin" in December 1943. Attached to the first bulletin is a one-page statement on cold prevention and treatment intended for employees.

NEW HAMPSHIRE.—The State Division of Industrial Hygiene has recently issued an attractive folder describing its services and the special additional services available to industry from other divisions of the New Hampshire Board of Health. This folder lists publications and selected educational materials available from the Division, the U. S. Public Health Service, and other sources.

NORTH CAROLINA.—An article on "Tuberculosis in North Carolina Industry," by Dr. T. F. Vestal, Director of the Division of Industrial Hygiene, appeared in the December issue of the Health Bulletin, the monthly published by the State Board of Health.

Personnel of the Division of Industrial Hygiene recently visited property located in Vance County, North Carolina, which is under development for the purpose of mining tungsten ore. Estimated tonnages of the ore have received very favorable comment from various persons interested in the enterprise. The potential silicosis hazard created by the mining and milling operations is being evaluated by the Division.

OHIO.—A series of conferences and programs, carrying out the general theme, "Industrial Health and the Doctor," will be presented the second week in February 1944 at Toledo, Cleveland, Columbus, and Cincinnati, by the Ohio State Medical Association and the Ohio Department of Health. The speakers for each of these meetings are: Dr. Carey P. McCord, Medical Consultant, Chrysler Corporation, Detroit; Dr. Frank F. Tallman, Director of Mental Hygiene, Michigan State Hospital Commission, Lansing, Michigan; Dr. Rutherford T. Johnstone, Director, Department of Occupational Diseases, Golden State Hospital, Los Angeles, author of "Occupational Diseases."

PENNSYLVANIA.—The Pennsylvania Bureau of Industrial Hygiene annually provides speakers on industrial hygiene subjects for the

senior class at Hahnemann Medical College, Philadelphia. Dr. Joseph Shilen, Director, and Frank J. Willard, Jr., Industrial Hygiene Engineer, have already presented lectures.

RHODE ISLAND.--The first occupational disease death reported in Rhode Island in the past 8 years occurred recently as a result of Halowax poisoning. In the industry concerned, properly designed and installed protective equipment had proved its efficiency in several tests. The moral of this particular case appears to be that continued and meticulous supervision of the workroom is necessary to prevent careless habits on the part of workers.

UTAH.--A 3-day meeting of labor, management, and State health and safety agencies was held at the State Capitol, November 15, 16, 17, 1943. This meeting was held to discuss the responsibility of labor and management for the promotion of health and safety procedures in industry. All local and State union officials, representatives from industry, industrial hygiene, and the industrial commission were invited to participate on the program and in the panel discussion which followed each day's program. This meeting, the first of its kind held in Utah, met with outstanding success. Each group represented gave its viewpoint on who is responsible for promoting health and safety in industry. The meeting was well attended at all times, especially the panel discussions which gave each individual a chance to present his idea or particular problem.

The demand for the industrial hygiene brochure entitled, "Useful Criteria in the Identification of Certain Occupational Health Hazards," by the Division of Industrial Hygiene, Utah Department of Health, 1942, exceeds all expectations. Two thousand copies have been sent to fill the requests of 241 different agencies and individuals. Forty copies were requested by the Office of War Information for use in the libraries of the Armies of Occupation in Europe. Foreign requests include England, Australia, Mexico, Puerto Rico, Cuba, Canada, and Chile. Reprinting of this pamphlet is being contemplated.

WEST VIRGINIA.--The Bureau of Industrial Hygiene has recently printed a new service bulletin outlining briefly industrial hygiene services available through the Bureau. This pamphlet has been sent to all county health officers and industrial plants in West Virginia.

An article on "Sewer Gas Hazards in Sewage Plants, and Their Control," by Dr. C. Scott McKinley, Director of the Bureau of Industrial Hygiene, appeared in December issue of Industrial Medicine. This article was written for the purpose of informing operators of sewage treatment plants of the serious health hazards from hydrogen sulfide and/or oxygen deficiency in plants treating combined domestic and industrial waste, the latter extremely high in combined sulfur content.

COOPERATIVE ACTIVITIES OF THE U. S. PUBLIC HEALTH SERVICE
AND STATE DIVISIONS OF INDUSTRIAL HYGIENE

Mr. J. J. Bloomfield, Chief, States Relation Section, made an appraisal of the services of the Michigan and Detroit Bureaus of Industrial Hygiene during the week of January 17.

Miss F. Ruth Kahl, Public Health Nursing Consultant, assisted the industrial hygiene divisions in Alabama and Missouri in January, advising on industrial nursing programs.

Dr. L. D. Heacock, Dental Surgeon (R), recently visited the TVA Chemical Plant at Wilson Dam, and the Alabama Department of Public Health, to consult on industrial dental problems.

Dr. F. H. Goldman, Senior Chemist, surveyed the industrial hygiene laboratory facilities of the Louisiana, Mississippi, Alabama, Georgia, South Carolina, and North Carolina departments of health during January.

COURSES

Industrial Nursing

The University of California Extension Division at Los Angeles announces a special group of public health courses for industrial nurses. These include classes in "Industrial Nursing and Occupational Injuries," Dr. Hugh Dierker and Miss Heiltje Wolzak, instructors; "The Industrial Nurse and Community Resources," Miss Zdenka Buben, instructor; "Industrial Hygiene for Nurses," dealing with occupational diseases, Dr. Francis E. Ballard, instructor; and "Public Health and Preventive Medicine," Dr. Kenneth H. Sutherland, instructor. In the same announcement nurses are informed that the new Extension program includes among courses of interest to them, classes in psychology, social institutions, individual health in industry, and one in minor crafts which will be definitely related to the problem of rehabilitation.

A course in industrial nursing (12 two-hour sessions) is being conducted at Loyola University, Chicago, by the staff of the Division of Industrial Hygiene of the Illinois Department of Public Health.

The Johns Hopkins University is offering an advanced course for nurses who completed the initial course in "Industrial Nursing" given the first semester of this year. The new course is entitled "Special Problems in Industrial Nursing."

Indiana University is extending the plan of offering courses in "Industrial Hygiene for Nurses," in cities throughout the State. In the current semester, courses will be held in Indianapolis, Richmond, and Fort Wayne. These courses are cooperatively arranged by the Indiana Board of Health, the Nursing Education Staff of Indiana University, and industrial nurses.

The St. Louis University School of Nursing announces an evening course in "Industrial Hygiene for Nurses."

Industrial Medicine

A postgraduate course in Industrial Medicine and Hygiene is being offered to physicians in Chicago under the direction of the Illinois Division of Industrial Hygiene and the University of Illinois College of Medicine, and under the auspices of the Committee on Industrial Hygiene of the State Medical Society and the Chicago Medical Society. The lectures will be given by experts in industrial hygiene and medicine. Forty-four physicians have registered for the course which will run from January 4 to March 28.

NEW MATERIALS

Copies of "Occupational Lead Exposure and Lead Poisoning," A Report Prepared by the Committee on Lead Poisoning of the Industrial Hygiene Section, American Public Health Association, may be purchased from the Association headquarters at 1790 Broadway, New York 19, New York, for 75¢ per copy.

PERSONNEL

Miss Doris A. Ramsey, R.N., has joined the staff of the New Hampshire Division of Industrial Hygiene as Industrial Nursing Consultant. Miss Ramsey was formerly with the Brown Company of Berlin, New Hampshire.

Mr. Dohrman H. Byers, Assistant Sanitarian (R), has been transferred from the Massachusetts Division of Occupational Hygiene to the Montana Division of Industrial Hygiene. He has been replaced in Massachusetts by Mr. Andrew D. Hosey, Assistant Engineer (R), formerly employed by the Virginia Department of Health.

MESSAGE TO DIVISIONS OF INDUSTRIAL HYGIENE

The questionnaires used in the industrial nursing survey conducted in 1942 will be returned to the respective State divisions on request to Miss F. Ruth Kahl, Public Health Nursing Consultant, Division of Industrial Hygiene, U. S. Public Health Service, Bethesda, 14, Maryland.

TVA HAS DENTAL PROGRAM SURVEYED

Dr. E. L. Bishop, Director of Health, Tennessee Valley Authority, requested the U. S. Public Health Service to survey and evaluate the dental program at Chemical Plant II, Wilson Dam, to make recommendations regarding the expansion and modification of the dental service as proposed by the plant's dental officer, Dr. V. B. Smith. This survey was made early in January by Dr. L. D. Heacock, Senior Dental Surgeon (R). In addition to specific recommendations on the dental

personnel, quarters, equipment, and record system for an enlarged program in the particular plant surveyed, suggestion was made that serious consideration be given to the development of dental service in the several medical services throughout the 4 TVA districts.

NEW PUBLICATIONS

(Supplement to Publications List of the Industrial Hygiene Division, U. S. Public Health Service, January 1944.)

SICKNESS ABSENTEEISM AMONG INDUSTRIAL WORKERS, SECOND QUARTER OF 1943, WITH A NOTE ON THE OCCURRENCE OF THE RESPIRATORY DISEASES, 1934-43. Pub. Health Repts., 58: 1885-88 (Dec. 24, 1943).

LEAD EXPOSURES AT THE GOVERNMENT PRINTING OFFICE. A. D. Brandt and G. S. Reichenbach. J. Ind. Hyg. Toxicol., 25: 445-50 (Dec. 1943).

ANALYSIS OF ATMOSPHERIC CONTAMINANTS CONTAINING NITRATE GROUPINGS. Herman Yagoda and F. H. Goldman. J. Ind. Hyg. Toxicol., 25: 440-44 (Dec. 1943).

Reprints Available

Reprint No. 2520. Frequency and duration of disabilities causing absence from work among the employees of a public utility, 1938-42. W. M. Gafafer.

News items for publication in INDUSTRIAL HYGIENE NEWS LETTER should be submitted to: Senior Sanitary Engineer J. J. Bloomfield, Industrial Hygiene Division, U. S. Public Health Service, Bethesda 14, Maryland.
