

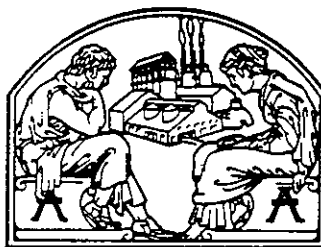
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INDUSTRIAL HYGIENE DIGEST

Literature Abstracts

- MEDICAL
- ENGINEERING
- LEGAL --- decisions and trends

Industrial Health News



Issued Monthly By

INDUSTRIAL HYGIENE FOUNDATION

4400 FIFTH AVENUE
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FOUNDATION FACTS

Foundation Facts is a monthly news-letter issued to industrial concerns holding membership in Industrial Hygiene Foundation. The Foundation is a combined research and service institution to protect the health of workers in industry.

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May, 1942

No. 5.

BULLETIN

Announcement is made of the appointment of Francis R. Holden, Ph.D., a specialist in healthful working conditions, as industrial hygienist on the staff of Industrial Hygiene Foundation. He will assist companies associated with the Foundation in controlling employee health hazards which are increasing with peak war production.

Dr. Holden, a physical and organic chemist, took his undergraduate work at Hobart College. He has specialized in industrial hygiene since completing his graduate studies at the University of Cincinnati in 1934. After a year at the Industrial Health Conservancy Laboratories in Detroit, working on hygienic problems in the automobile industry, he served as industrial hygienist for Pittsburgh Plate Glass Company for more than 5 years. For the past year and one-half Dr. Holden has been on the natural gas fellowship at Mellon Institute, Pittsburgh.

Dr. Holden will be in charge of industrial hygiene surveys for Industrial Hygiene Foundation. Industrial health problems in manufacturing are growing with the increased use of chemicals, longer hours of work, intense war efforts, and the employment of women workers and older men.

Old Member Rejoins; Agencies Subscribe for Publications

General Refractories Company, formerly affiliated with the Foundation, resumed its membership last week. Meanwhile, the National Institute of Health, the Navy Department, the States of Indiana and Montana and the Cities of Detroit and St. Louis have recently subscribed for Foundation publications. Nineteen states and four cities now receive this service. Three educational institutions subscribe: Case School of Applied Science, Johns Hopkins University and University of Colorado, as well as three independent specialists in the field of industrial health -- Dr. J.W.G. Hannon, of Washington, Pa., Dr. E.R. Hayhurst of Columbus, O. and Dr. C.O. Sappington of Chicago. These subscriptions, restricted to governmental and other non-industrial agencies, were created by the Board of Trustees, effective January 1 of this year.

"Required Reading for Industrialists"

Editorialized the PITTSBURGH SUN TELEGRAPH recently, "The report of Industrial Hygiene Foundation, which maintains headquarters at Mellon Institute, should be required reading for industrialists; for increasing production tends to increase health...hazards in industry, and the Foundation is seeking ways to eliminate them." (This refers to the Foundation's section in Mellon Institute's annual report, copies of which were distributed to members last month.)

"First Things First"

There has been a lot of emphasis lately on employee "attitudes," "enthusiasm," "morale," "cooperation," etc., but insufficient attention to employee health and safety. No opinion poll or attitude study is needed to show that healthful working conditions are fundamental in harmonious employer-employee relations. More attention to this basic subject and there will be less need for morale building. More attention to this subject and there will be fewer manhours wasted, more production!

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Industrial Hygiene Foundation,
4400 Fifth Avenue,
Pittsburgh, Pa.

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INDUSTRIAL HYGIENE DIGEST
Literature and News

Legal Developments

- 437 Industrial Commissions's Order Allowed to Become Final. Not Subject to Review. Duty of Commission to Hear and Determine Whether Award Paid.
Petitioner sustained a compensable injury and was paid \$2520. The State Industrial Commission, after hearing held on application to reopen on the ground of change in condition, made an award for permanent total disability and fixed compensation at \$8400.00. On December 3, 1937, the order became final. Petitioner undertook to show that he and his guardian had not consented to the order of December 3, 1937, insofar as it directed payment of attorneys fees and also offered evidence to show that there still remains some balance due and unpaid in the award. The trial commissioner sustained a demurrer to the evidence and failed to make any finding as to what amount remained due and unpaid on the award. This is the order under review. An award which is permitted to become final may not be thereafter reviewed by the commission on the theory that the order was erroneous in some respect. Therefore, the trial commissioner proceeded properly when he refused to reconsider the order of December 3, 1937. However, the trial commissioner misconceived the extent of responsibility which rested upon him when he declined to ascertain whether payment of the award had been made as directed. The State Industrial Commission has the mandatory duty of hearing and disposing of claims arising under its jurisdiction on the merits. The order of the trial commissioner is vacated with directions to hear the evidence and to determine whether respondent has fully paid the award, and to make an order appropriate to the facts found. Smith v. Oklahoma Portland Cement Company et al. Okla. Supreme Ct. Decided May 5, 1942. (CCH).
- 438 Injury Allegedly Due to Negligence. Steel Wool. No Inherent Danger. Simple Tool. Domestic Servant.
Plaintiff, employed by the defendants as a domestic servant, asserts that she was injured through the negligence of the defendants. The negligence assigned is the failure of the defendants to provide her with reasonably safe, suitable and adequate tools and proper and safe means of doing her work. Particles of steel wool penetrated three fingers. No medical testimony was introduced by plaintiff. A motion was then made by the defendants for a dismissal of the complaint. The court granted the motion. Thereafter, a new trial was granted. Dismissal of the complaint was proper. The article which plaintiff was using was a common household appliance. It is not inherently dangerous. There was nothing which might cause the defendants to anticipate injury. An employee cannot predicate a cause of action based upon negligence against his employer, if he is injured from

a defective simple tool. Order appealed from, reversed and the complaint dismissed. Adam v. Konvalinka et al. N.Y. Supreme Ct., App. Div. 1st Dept. Decided May 8, 1942. (CCH).

Industrial Health Hazards and Their Effects

- 439 Maintenance of Health in Chemical Industries. H.F. Smyth, Jr. Chem. Indus., 50, 514-516 (April, 1942).
"In proportion to the potential hazards of processes and products, few workers in the chemical industries receive injuries to health. This is particularly surprising when one considers that all the accident hazards of the mechanical processes may be present in the chemical plant in addition to the dangers inherent in the raw materials themselves. However, in chemical processes fewer men are needed to produce a ton of product than in many other industries and there is less human handling of that product. Thus, the particular toxic and irritant properties of chemicals are partly counterbalanced by less opportunity for contact between man and material. This matter of contact is the crux of health maintenance in the chemical industry. Few measures other than reduction of contact will prevent injury to health." The toxicity of new chemicals produced by several chemical manufacturers is tested before they are placed in full-scale production, largely by animal experiments. Judicious choice of animals gives the best comparison with effects on human beings, and although animal results cannot be translated quantitatively into human effects, qualitatively the results are reliable. The author discusses cumulative action and elimination, the methods of contact and of entry into the system of the various classes of injurious substances, and general methods of protection. Knowledge of hazards, adequate labeling and education of workmen in health hazards are urged.
- 440 Potential Health Hazards of the Leather Industry. W.J. McConnell, J.W. Fehnel and J.J. Ferry. J. Ind. Hyg. & Toxicol., 24, 93-108 (May, 1942).
The authors report a survey of the physical environment of the leather industry, consisting of a total of 62 plants, including tanneries, shoe, and miscellaneous leather goods factories. A brief description of processes employed in tanning and making shoes and other leather goods is given, and real or potential health hazards incident to manufacturing processes are discussed. Many of the hazards formerly associated with the industry have been eliminated by introduction of new and improved methods. The chief hazards remaining lie in the common use of a wide variety of chemicals, including alkalis, acids, chromates, vegetable and synthetic tanning materials, oils, finishes, dyes, solvents, and other materials which may cause skin affections and systemic poisoning among workers either handling these materials or exposed to their vapors. In a number of plants the concentrations of volatile vapors, especially benzene, exceeded safety limits and were sometimes decidedly dangerous. Skin infections following small abrasions and cuts are hazards particularly present in all tannery jobs. While the less dangerous pus-producing organisms usually are the causative agent, the possibility of anthrax infection among workers handling hides must not be overlooked. Many tannery workers are also exposed to varying temperatures and humidities and wetness, which may be influencing or contributing causes of illness. Practical measures for the safe operation of plant processes are outlined. The paper as a whole is a thorough summary of the hazards of the industry.

- 441 Silicosis in New Zealand. Report of a Case, with Histological Details and Chemical Analysis of the Lung. W.J. Gwynne. New Zealand Med. J., 39, 132-136 (1940).
A case of silicosis in a New Zealand gold miner is reported in detail. The lung contained ash 77.09, combined silica 13.00, free silica 9.30, alumina 9.30, ferric oxide 0.14, lime 1.68, magnesia 0.55, phosphoric acid 10.85, and free carbon 4.00, mg. per g. dry lung. It was estimated that one lung contained 1.05 g. free silica and 1.43 g. combined silica. By the histological examination conducted in South Africa and the chemical analysis of the lung performed in Australia it is shown that the lesions closely resemble conditions of silicosis seen in these countries.
- 442 Pneumoconiosis in the Talc Industry. F.W. Porro, J.R. Patton and A.A. Hobbs, Jr. Am. J. Roentgenol. & Radium Therapy, 47, 507-524 (April, 1942).
Literature pertaining to pneumoconiosis due to exposure to certain silicate dusts is reviewed. Fifteen cases of pneumoconiosis in talc workers are reported, including 5 autopsies. Disability or death is directly attributed to the pneumoconiosis in 13 of the cases; of the remaining two, pneumoconiosis is contributory in one and incidental in the other. The nature of the dust, symptoms, pathology, roentgenographic findings, diagnosis, complications and prophylaxis are discussed in some detail, with 17 illustrations and several tables. The authors conclude: (1) that pneumoconiosis causing disability and death does occur in talc workers, and (2) that the disabling changes are principally due to the talc itself.
- 443 Further Lung-Dusting Experiments. A.E. Barclay and others. Am. J. Roentgenol. & Radium Therapy, 47, 362-367 (March, 1942).
The authors report a continuation of work published in 1938, which was undertaken to determine the course of removal of large quantities of dust introduced into the lungs of cats. The dust was administered both by insufflation and by inhalation. Roentgenograms were taken before and after introducing the dust and the lungs were removed and examined roentgenographically and histologically after killing the animals. The dusts used were lead glass, bismuth carbonate and un-compressed flame gas carbon varying in fineness from 45 to 0.5 microns. The authors are not ready to draw final conclusions, but a few points are of interest. The amount entering the alveoli was small and never discernible with certainty in the roentgenograms. However, there was always some dust in the alveoli as shown by histological examination, and that point was not discovered in the earlier report when less exact methods were used. The alveolar dusting did not run parallel with bronchiolar dusting. Introduced dusts appear to collect in greater amounts in inflated areas of the lung. Removal of dust from the alveoli was found to be rapid; sometimes alveolar dust cells ingested dust particles within a few minutes of their introduction. Removal took place through the bronchioles, and out on the layer of viscid mucus by the action of the cilia. There was no roentgenological evidence of deposition of dust in the bronchial lymph nodes, and this point seems to indicate that in healthy animals the dust is not transferred to the lymph nodes to any great extent. The outstanding feature of the experiments was the apparent existence of a defense mechanism preventing the entry of large quantities of dust into the alveoli. The lungs can also deal effectively with suspensions of active fungi. However, preexisting disease may well interfere with the normal excretion of dusts and be a potent feature in the causation of industrial pulmonary complaints. One factor is the excessive watery secretion that may carry dust into the alveoli.
- 444 Lead Poisoning. H. Replik. Med. Klin., 36, 291-293 (1940). (German).
The peculiarities of lead absorption and of the distribution of lead in the organism cause great difficulties in persons exposed to lead. This is especially true in repeated lead absorption. Various technical improvements have made possible extensive reductions in the danger of lead poisoning, but not all possibilities of danger can be removed.

- 445 Trauma and other Occupational Factors in Tuberculosis. P.A. Guaintance. Ind. Med., 11, 199-201 (May, 1942).
Occupational environments, such as exposure to free silica, certain silicates, war gases, temperature changes, and physiological states, and mechanical and surgical trauma are factors in the development and reactivation or aggravation of tuberculosis. The relation of trauma from industrial accidents to tuberculosis is often difficult to decide, but each case should be decided on its own merits after considering all essential criteria for establishing an occupational relationship. Pre-employment examinations aid not only in case finding, but also in prevention of the spread of tuberculosis due to occupational factors.
- 446 Health Hazards in Pearl Button Industry. Queries and Minor Notes. J. Am. Med. Assoc., 119, 232 (May 9, 1942).
A woman working in a pearl button factory had respiratory symptoms, and loss of weight, which raised the question whether they were due to her employment. In 1920 Birge and Havens published the results of a survey of the industry (J. Ind. Hyg., 2, 81 1920), showing that the general health of employees was good, but that "catarrhal conditions" were common and that there was a good deal of dust in spite of exhaust systems. No more tuberculosis was found among employees than in the general population. Infections of the hands and osteomyelitis of the bones of the hand and forearm were not found. Rheumatism and indigestion were common complaints. The cause of the symptoms described is undecided.
- 447 Milk as a Preventive of Lead Poisoning. Queries & Minor Notes. J. Am. Med. Assoc., 119, 115 (May 2, 1942).
Milk has no specific action in preventing lead poisoning, but is an excellent supplementary dietary agent. The arguments for and against high daily milk intake for persons exposed to lead poisoning, are presented. The therapeutic value of the milk, if any, lies in its calcium content, and the effect of calcium is the subject of controversy. The viewpoints of several authors on that point are presented. There appear to be good reasons for stating that the use of milk for lead workers is most commendable, but not as the keystone of a program for the prevention of lead poisoning.
- 448 Paints and Multiple Sclerosis. Queries & Minor Notes. J. Am. Med. Assoc., 119, 116 (May 2, 1942).
The question is whether multiple sclerosis in a spray painter is attributable to lead poisoning. The reply lists the common symptoms of lead poisoning -- anemia, abdominal pain, headache, blue line on the gum, arteriosclerosis, basophilic degeneration of the red cells and lead deposits on the long bones, but there is no clinical or pathological proof that lead intoxication can cause multiple sclerosis.
- 449 Cadmium Poisoning. Div. of Industrial Hygiene, U.S. Public Health Service. Pub. Health Repts., 57, 601-612 (April 24, 1942).
This is a brief but thorough review of the literature on cadmium poisoning, with 109 bibliographic references. The table of total number of cases is of interest; 346 cases in all have been reported, of which 218 were contributed by Cangelosi in 1941.
- 450 Gasoline Intoxication. M.Z. Gross. Hygeia, 20, 257, 293-295 (April, 1942).
In a paper reviewing current opinion the author points out that motorists, filling station operators, and industrial workers are increasingly exposed to gasoline fumes. In addition to the factor of increased use, the changes in the chemical nature of the hydrocarbons found in modern gasoline add to the health hazard. The findings of Machle, Hamilton and Fieldner are reviewed. The author gives a few typical cases of poisoning and describes the signs and symptoms that may be expected in acute and chronic exposures.

- 451 Nitrogen Oxide Fumes. Treatment After Their Inhalation. W.D. McNally. Ind. Med. 11, 207-208 (May, 1942).

The poisonous action of nitrogen oxide fumes is that of nitrites produced by their reaction with water and with the alkali of the blood. Exposure to these fumes is becoming more common with the increase in manufacture of nitric acid and nitrates. The poison is insidious as the effect may not be produced for some hours or even days. The treatment recommended by the author includes inhalation of oxygen by catheters for 12 hours, followed by tent method oxygen inhalation, with injection of calygran and glucose in case of severe edema. Recovery of serious cases has followed this treatment. Men who have been gassed several times are more sensitive to the gases and should not return to the same work. The period of incapacity varies from 6 days to 6 weeks. The gases have also a narcotic effect which may make the early symptoms unnoticeable. The fumes may be found wherever nitric acid is used.

- 452 Trichloroethylene. Industrial Data Sheet D-Chem. 27. (Revised). Nat. Safety News, 45, 54, 56 (April, 1942).

This is a revision of a Data Sheet issued in 1938 and abstracted at that time, but the increasing use of this material and additional knowledge of its properties have called for a revision. The hazards of using trichloroethylene include poisoning through inhalation of the vapor, and dermatitis from contact with the liquid or vapor. It is similar to chloroform in general properties, and is used principally as a solvent for oils, greases and waxes. Authorities disagree as to the toxicity of the vapor, but 1 part in 100 parts of air (53.6 mg. per liter) is agreed to be definitely narcotic. Some states have set the maximum allowable concentration at 1/50 of that amount, 200 parts per million or 1.07 mg. per liter. Trichloroethylene has anesthetic effects but apparently does not cause fatty degeneration of the liver. Acute symptoms include drunkenness, dullness, irritation of the upper respiratory tract, vomiting and unconsciousness, followed by diarrhea, headache, anorexia, vertigo, disturbed heart action and general illness. However, the effects do not appear to be cumulative. Contact with the skin should be avoided on account of drying of the skin and possible sensitization. Treatment includes immediate removal from the fumes, artificial respiration if breathing has stopped, keeping the victim warm and calling a doctor. Preventive precautions involve a number of points in the design and operation of degreasers, all with the purpose of preventing escape of the vapor. Speed, cleanliness of work, shape of work, shock load and fullness of the tanks are factors. Downdraft exhausts are sometimes necessary. Contact with open flames and hot surfaces should be avoided. Men should not be permitted to enter sludge tanks to remove the sludge. On large apparatus where entrance is necessary, hose masks should be provided. Exposure of the skin must be avoided, and contaminated clothing should be removed at once and not worn again until laundered. Employees should have physical examinations regularly. Approved hose masks and chemical cartridge respirators may be used in temporary exposure to low concentrations of trichloroethylene but they should not supplant a suitable exhaust system.

- 453 The Treatment of Acute Carbon Tetrachloride Poisoning with a Report of Two Cases. B.R. Allison. Ann. Intern. Med., 16, 81-93 (January, 1942).

Two cases of acute carbon tetrachloride poisoning are described, one by inhalation and the other, which was fatal, resulting from drinking a cleaning fluid. The most important factors in the treatment are the immediate and continuous administration of calcium and glucose until evidences of intoxication and organic damage have disappeared. Insufficient attention has been given to carbon tetrachloride as a poison in textbooks and in teaching, and a plea is made for fuller recognition of its poisonous properties. Laws requiring proper labeling of products containing carbon tetrachloride are urged, and education of its users is suggested.

16-0010561

- 454 External Contact with Monoethyl Ether of Diethylene Glycol (Carbitol Solvent). A.G. Cranch, H.F. Smyth, Jr. and C.P. Carpenter. Arch. Dermat. & Syphil., 48, 553-559 (March, 1942).

The authors present experimental results bearing on the effect of external applications of the monoethyl ether of diethylene glycol, often known under the trade name of carbitol solvent. In the rabbit eye dilute solutions of this solvent are less irritating to the mucous membrane than similar solutions of glycerin. When concentrated solutions are kept in contact with large wounds in the rabbit flank extending into the muscular fascia, insufficient irritation to the tissue results to retard healing, and during as many as 23 days' contact no injury was observed from absorbed material. The authors obtained indications that fewer persons have a cutaneous allergy to carbitol solvent than to glycerin. As a sensitizer of human skin carbitol solvent may be regarded as equivalent to wool fat and oerate U.S.P.

- 455 Effect of Mercury Vapor Lamps on the Eye. Queries & Minor Notes. J. Am. Med. Assoc., 119, 232 (May 9, 1942).

Mercury vapor lamps, when the rays are directed into the eye, can cause an irritating conjunctivitis and superficial punctate keratitis. The lights used industrially, however, are usually very high and of insufficient intensity to cause irritation to the average person. Blondes are more susceptible to such rays than brunets. Long exposure to sun lamps without wearing goggles can cause the above symptoms and even opacities of the cornea.

- 456 Study of Certain Epidemiological Features of Leptospirosis Jaundice in Baltimore. T.G. Ward and T.B. Turner. Am.J.Hyg., 35, 122-133 (January, 1942).

The diagnosis of 8 cases of acute leptospiral jaundice in Baltimore from July, 1940, to June, 1941, led to some epidemiological studies, involving over 800 persons. Positive agglutination tests for *L. icterohaemorrhagica* were obtained in 46 cases. Except for the patients from the medical wards of 2 hospitals and persons submitting sera for routine serological tests, the selection was by occupation, and every case giving a positive test worked under unsanitary conditions where rats were common. Out of 8 other cases all but one were traceable to rats or to a polluted well. From these studies it was concluded that leptospiral jaundice occurs more frequently among residents of Baltimore than available records indicate. The risk of infection was highest in persons whose work brings them in contact with water subjected to pollution by rat urine. Poultry dressing and meat packing are two occupations of this type. Wells subject to pollution by rat urine may serve as sources of human infection.

- 457 Some Medical Problems Encountered in Modern Air Travel. J.W. Heim. J.Ind.Hyg. & Toxicol., 24, 109-115 (May, 1942).

The principal injurious effects of high altitude flying include those due to lack of oxygen and the mechanical effects of reduced barometric pressure. Both subjects are discussed, and experiments on oxygen deprivation are reported. The cumulative effect of repeated anoxia over a period of time is at least as important as its effect in a single flight, and the experiments dealt with that phase of the problem. Five college students were exposed to an altitude pressure of 12,000 feet for 4, and later for 7 hours daily for 27 days. The usual mental and physical fatigue and other symptoms of single exposures were experienced but there was no adaptation to conditions and no permanent deleterious effects. It is recommended that flying personnel subjected to altitudes of 12,000 feet and above should utilize oxygen at all times during flights in order to maintain their efficiency, but also for the succeeding 24 hours. The best suggestion for the solution of the anoxia and low pressure problems is the use of sealed aircraft compartments, within which artificial conditions may be created and maintained.

- 458 Occupational Health Hazards in Aircraft Production. J.P. Russell and F.R. Ingraham. *War Med.*, 1, 811-816 (November, 1941).
Many processes and operations in the manufacture of aircraft involve exposure to potentially harmful gases, fumes, dusts, vapors, chemicals and skin irritants. These processes include the making of wood and plaster patterns for dies; the pouring of lead and zinc die for drop hammers, which form duraluminum sheets into required shapes; the construction of jigs, or racks, for assembling parts; the cleaning and plating of metal parts; the preparation of control cables and electric wiring; the painting of parts, subassemblies and planes, and the preparation of rudders and moveable wing parts from cloth, which is treated with a nitrate dope. The aircraft engine manufacturing industry is not included in the scope of the paper. The hazards of each of these operations are discussed, and suitable protective devices and precautions are recommended.
- 459 Deforming Arthritis Found Among Compressed Air Workers. G.N. Edson. Quoted in *Labor Stands.*, 5, 7-8 (January-February, 1942).
The ordinary caisson disease, or "bends", is not the only form of disability encountered by men who work under compressed air. Examination and observation of many caisson workers show that they may develop diseased bones and joints, culminating sometimes in disabling arthritis. Incomplete decompression results in accumulation of nitrogen gas in the bones, and there is no test to show whether decompression is complete. The accumulation of nitrogen causes either blocking of the artery or stopping the blood supply by direct pressure in the bone cavity. Under those conditions death of part of the bone occurs. This dead bone can be definitely shown in x-ray pictures and its x-ray appearance is very characteristic. This process occurs mostly in the extremity bones because they are highest in fatty marrow. If the necrosis borders on a joint, it leads gradually to absorption, collapse and new bone formation, ending in deforming arthritis.
- 460 Industrial Fatigue. Meyer Brown. Pamphlet, published by Zurich General Accident and Liability Insurance Co., Chicago, April, 1942. 18 pp.
The author reviews and summarizes the literature on industrial fatigue first giving Vernon's distinction between physiological and industrial fatigue, in that the latter is partly physical and partly mental. The factors affecting fatigue, including personal health, non-occupational influences, working environment, noise, lighting, morale, and monotony, are discussed. The studies on effect of length of the working day and week on production are reviewed, and absenteeism, accidents, labor turnover, spoilage and errors are given as additional results of fatigue. Rest periods and control of non-occupational disability are discussed as additional factors in the prevention of fatigue. A bibliography is included.

Methods of Detection and Determination

- 461 The Analysis of Atmospheric Samples of Explosive Chemicals. F.H. Goldman. *J. Ind. Hyg. & Toxicol.*, 24, 121-122 (May, 1942).
Electrically operated equipment is unsafe in the sampling of many explosives, and sampling is thus limited to the gas sampling bottle and the midget impinger. Color reactions and brief methods of analysis for the following explosives and intermediates are recommended: diphenylamine, mercury fulminate, nitroglycerine, PETN (pentaerythrite tetranitrate), dimethylaniline, tetryl, mono-oil (mononitrotoluene), DNT and TNT.

- 462 A Laboratory Apparatus for Studying Settling Rate and Fractionation of Dusts. J.W. Heuberger and M. Turner. *Phytopathology*, 32, 166-171, (1942).
The construction of an apparatus suitable for the study of the settling rate of dusts is described.
- 463 A Method for Determining Unsaturated Hydrocarbons in the Air. D.P. Senderikhina. *Trudy Moskov. Sanit. Inst. in Erismann*, pp. 88-101 (1939). (Russian).
The methods of Huebl, Manus and Rosemund for the analysis of unsaturated hydrocarbons in the air were found to give inaccurate results on such materials as chloroprene, pseudobutylene and bivinyl, the errors sometimes running as high as 15 to 23%. The author proposes a colorimetric method for determining very small concentrations of unsaturated hydrocarbons in the air, based on their ability, in glacial acetic acid solution to produce in the cold a yellow color in the presence of diazotized p-phenylenediamino sulfate. The color is stable for 20 minutes. This method can be used for the analysis of chloroprene and bivinyl.

Control Methods

- 464 Physics and Protection Against Industrial Dust. K.L. Goodall. *J. Sci. Instruments*, 19, 33-40 (March, 1942).
The various old and new instruments for determining dust are described briefly, with illustrations. Protective measures against industrial dust are treated briefly. Fire and explosion risks from industrial dusts are discussed.
- 465 Ventilation Requirements for Radium Dial Painting. W.C.L. Hameon and R.D. Evans. *J. Ind. Hyg. & Toxicol.*, 24, 115-120 (May, 1942); *Heat. & Vent.*, 39, 23-26 (May, 1942).
The recent unprecedented demand for luminous dials for aircraft instruments and other war machines has engaged the attention of industrial health authorities on account of the hazards of the occupation. The authors discuss the ventilation phase of the problem, leading to recommendations which ensure a radon concentration below 10^{-11} curie per liter of air. They include an exhaust rate of 50 c.f.m. in the booths, alternative specifications for storing and drying cabinets, location of painted dials so that the radon formed is withdrawn by local exhaust or diluted to a safe concentration, and opening sealed paint containers only inside a hood or ventilated cabinet when they have been sealed for several hours.
- 466 Less Toxic Substitutes for Materials in Industrial Use. S. Moskowitz. N.Y. *State Ind. Bull.*, 21, 115-118 (March, 1942).
The manufacture of self-sealing gasoline tanks requires the use of neoprene adhesive, for which the usual solvent is benzene. Serious exposure to benzene was found in a factory producing such tanks, and a number of the employees were suffering ill effects. Substitution of toluene for benzene and installation of exhaust ventilation resulted in marked improvement in health and alertness of employees. The aircraft and airplane parts industries are large consumers of toluene, and sometimes it is difficult to obtain as a paint thinner. Some thinners are high in benzene and the composition is not always correctly stated. Such thinners should be analyzed and are being analyzed by the New York Department of Industrial Hygiene. Solvents high in benzene should not be used in the aircraft industry without thorough ventilation, and it is simpler and less expensive to use toluene, for which the ventilation requirements are less stringent.

In the paper and in an editorial following, it is made plain that there is no law prohibiting the use of benzene, as erroneously stated in some newspapers, but that the ventilation requirements are severe where benzene is used.

- 487 Ventilation as a Means to Prevent Silicosis in Ontario Gold Mines. C.S. Gibson. Presented at Annual Meeting of Canadian Institute of Mining, Toronto, March 9, 1942. Multigraphed. 38 pp.

The report covers an extensive study of ventilation in Ontario metal mines. In the survey of each mine 100 to 200 dust samples were taken with the konimeter at locations chosen to show most decisively the effects of ventilation. In mines depending only on natural ventilation, whether single or dual entry, shallow or deep, the greatest amount of dust was at the lowest levels and where the dust was generated, showing that it was not effectively removed, although in deep mines natural ventilation is at its best. Natural ventilation is improved by door control, and one of the surveys demonstrated that point by dust counts when doors in the natural pathway were left open. Controlled forced draft in a deep mine reduced the dust concentration at all points tested to below 200 particles (under 5 microns) per cc. (the konimeter results cannot be absolutely correlated with impinger figures, but the figure of 200 particles per cc. is about the formally accepted safe limit corresponding to 10 million particles per cubic foot with the impinger.) In mines with natural ventilation only, the dust concentration was in several cases above 1000 particles per cc. In Ontario mines, topography does not favor natural ventilation, as there is usually not more than 100 feet difference in height between inlets and outlets. Mechanical ventilation is being used in a number of mines and its use should be extended. Heating of the intake air is sometimes necessary in winter. A number of mines now use shafts to deliver air to the bottom levels, so that the fresh air is available for dust removal and cooling at the working face, and dust and excess moisture are driven up and out of the mine. This plan also allows some surface raises to be kept open in winter, and keeps fresh air in service channels at all times, which is especially important in case of fire. Several means of accomplishing downcasting shaft methods are described. Timber exposed to the moving air becomes dry and should be kept moist. The effect of method of stoping on ventilation is discussed, and arguments for mechanical ventilation in the stopes are presented. Most dust in the stopes is caused by percussion drills, and good ventilation should be supplemented by the use of dust control devices on the drill itself. Next in order of dust production are secondary blasts, slushing and hand shoveling, and the dustiness of these operations is being decreased. Primary blasts are no longer fired during the shift. Control chutes and dumps to passes are totally enclosed in some mines. Underground crushers should be completely enclosed and evacuated, with filtration of the air. There is no exact method for determining the volume of air required for ventilation. Experience and dust counts aid in giving estimates. Types and duties of fans in service are listed in a table, with a rough estimate of cost. Auxiliary ventilation of dead ends and other places inaccessible to ordinary ventilation are discussed.

- 488 Air Conditioned Chemistry Laboratory Does its Part in Winning the War. L.T. Avery. Heat., Pip., & Air Cond., 14, 295 (May, 1942).

In one of the rooms in a Chemistry laboratory for an industrial plant engaged in war production, temperatures must be varied over a range of 68° to 86° F. and relative humidities from 35 to 65 per cent. Air requirements of the exhaust hoods also complicate the problem---. The scheme used for air conditioning involves a refrigerator compressor for cooling, steam coils for heating, a pan type humidifier, and a silica gel machine for dehumidification -- thus, separate control of temperature and humidity is provided. --- Hunting of the room temperature curve on the heating cycle was corrected by using an anticipating type of control. Author's summary.

- 469 Protecting Life, Property and Production in the Foundry Industry During the War. Anonymous. Foundry, 70, 110 (May, 1942).
A code of recommended practices developed by the Industrial Hygiene Codes Committee of the American Foundrymen's Association is presented. The code was developed at the suggestion of the Office of Civilian Defense and has been revised and passed by that office. It proposes practices, rules and admonitions designed to prevent the serious curtailment of production in the foundry industry through subversive activities or actual bombings.
- 470 Maximum Efficiency from Modern Equipment for Collection of Dust. Anonymous. Concrete (Cement Mill Edition), 50, 5, 166 (1942).
A characteristic of all cement plant dust is its small particle size. This is true of both the raw materials and the finished product. The collection of the dust carried by kiln gases is the most difficult problem faced by the industry, in a large part due to the large volume of gases involved. One investigator reports that the average particle size of the dust encountered is 1 micron (0.001 mm.). A discussion of the use of various dust collecting systems includes (1) the filter type; (2) the mechanical types; (3) washing systems, and (4) electrostatic systems.
- 471 Study of the Effects of Various Types of Gas Masks on Working Capacity. T. Bruce and S. Helander. Nordisk. Med., 7, 1181-1187 (1940).
Working with a gas mask results in oxygen debt, in other words raises the oxygen requirement above that normally incident to the work done. This increase is attributed to the dead space of the mask and to the resistance of inspiration and expiration. Masks without an expiratory valve (in which the expired air is forced out on the cheeks) bring about a less marked rise in oxygen debt than those with an expiratory valve, although the latter exert less resistance to respiration. The use of both inspiratory and expiratory valves gives the lowest increase in oxygen debt. Practice in the wearing of masks is of great significance in diminishing respiratory difficulties. The oxygen debt can be diminished more and more by practice in wearing the mask until almost basal values are reached.
- 472 A Mask Apparatus which Provides High Oxygen Concentrations with Accurate Control of the Percentage of Oxygen in the Inspired Air and Without Accumulation of Carbon Dioxide. A.L. Barach and M. Eckman. J. Aviation Med., 12, 39-52 (1941).
The mask apparatus is described in which an air injector is used to provide known percentages of oxygen in the inspired air, accurately controlled by a dial of the apparatus. It is recommended for clinical oxygen therapy, and also in commercial and military aviation, at altitudes between 10,000 and 33,000 feet. It is economical in the use of oxygen and offers no resistance to breathing.
- 473 Heat Gain Through Walls and Roofs as Affected by Solar Radiation. F.C. Houghten and others. Heat., Pip., & Air Cond., 14, 306 (May, 1942).
Design heat gain rates for 11 walls and 18 roofs at various orientations are reported in this paper based on experimental observations conducted in an 18 x 18 x 8 ft. high exposed cubicle. Results indicate that with minor variations the heat flow through east, south and north walls was 83, 75 and 46 per cent, respectively, of that of the west wall. -- Authors' summary.
- 474 Determining Sound Attenuation in Air Conditioning Systems. D.A. Wilbur and R.F. Simons. Heat., Pip., & Air Cond., 14, 317 (May, 1942).
The requirements are stated for a basic method of determining attenuation. A detailed description of a method satisfying these conditions is given with experimental evidence to show the necessity of requirements and the degree to which they are met. The results of the application of this method to straight unlined

ducts show that attenuation in this case is less than 0.2 db per foot except in the regions of panel resonance of the duct walls, and except for high frequencies in small ducts. -- Authors' summary.

Industrial Medical Practice

- 475 Medical and Surgical Service in a Large Plant. J.H. Chivers. Ind. Med., 11, 208-211 (May, 1942).

The functions of a medical department in a large plant (5,000 or more employees) are described. One point emphasized is that the personnel of a medical department should be large enough to render individual care to every employee who needs the service of that department. Personal service cannot be rendered on a mass production basis. The field of industrial medicine and surgery is sufficiently important to warrant full-time service at an attractive salary. The author believes that a first-aid kit should consist only of sterile dressings, bandages, a tourniquet, a bottle of boric acid solution for caustic eye burns and nothing more. Other material in incompetent hands may complicate the injury. It should be understood that the simplest first aid is to be given and the patient taken at once to the physician. Some common sources of contamination should be forbidden and nurses should be trained in aseptic handling of injured parts. In discussion of the general duties of the department, the plant physician's interest in non-occupational diseases, his relation with the private physician, the confidential nature of reports, the author agrees substantially with many others whose papers have been summarized. He believes that the same kind of service can be conducted at a plant with only 500 employees.

- 476 Industrial Health in Wartime. M.N. Newquist. Ind. Med., 11, 236-237 (May, 1942). In 1940, occupational deaths increased by 10% with an increase of 2 to 3% in total employment, and disabling injuries increased accordingly. Twelve factors of increased accidents, and of impaired health, which is not included in the statistics, but must be considered, are given: (1) inexperienced workers; (2) increasing numbers of women workers; (3) greater number of physically handicapped; (4) lack of general physical fitness; (5) lack of adequate safety measures and instruction; (6) speeding up of machines and production processes beyond optimum human rhythm; (7) overcrowding; (8) unhealthful working conditions; (9) fatigue (discussed at some length); (10) inadequate nutrition; (11) disturbed transportation and home living conditions; (12) epidemics. The nine remedies suggested for these factors include safety organization, first aid and medical facilities, adequate health service, arrangement of work hours for maximum production without impairment of health or efficiency, keeping adequate records of accidents, health and absenteeism, encouraging rest, diet and recreation for the worker, and a few others that are obvious.

- 477 Industrial Health Program. Organization and Cost. A.G. Kammer. Ind. Med., 11, 216-218 (May, 1942).

The general procedure in conducting physical examinations and recording and using their results at the Indiana Harbor works of the Inland Steel Company is described. The annual cost of the program, about \$25,000, is analyzed.

- 478 Outline of Procedure for Physicians in Industry. Council on Industrial Health. J.A.M.A., 118, 895-896 (March 14, 1942).
The Council on Industrial Health has prepared this outline as a convenient reference and guide for physicians interested in industrial medical relationships. The objects of promotion of health and physical well-being of industrial employees should be accomplished by: (1) Prevention of disease or injury in industry by establishing proper medical supervision over industrial materials, processes, environments, and workers; (2) Health conservation of workers through physical supervision and education; (3) Medical and surgical care to restore health and earning capacity as promptly as possible following industrial accident or disease. The duties and relationships of the physician in industry are outlined.
- 479 The Health of the Executive. H.C. Habcin. Ind. Med., 11, 216-221 (May, 1942).
The author uses the word executive in the broad sense of one who earns his living largely by the use of his mind, and explicitly includes all professional workers. The importance of health measures for our industrial workers has been recognized, and disease and accidents have been greatly reduced by such measures, but no such health record can be credited to the executive's side of the ledger, and it is only recently that any attention has been given to the health of the executive. The life span has been greatly lengthened over the last 150 years, but the incidence of diseases of the cardiovascular system has increased. Among professional men, these diseases account for a high percentage of deaths (62% among physicians who died in a particular month). Physical examination of 176 executives revealed hypertension in 13%, duodenal ulcer in 18%, and coronary sclerosis syphilis, gout, sigmoid or rectal polyp, diabetes and carcinoma in percentages ranging from 2 to 7. Hypertension, sclerosis and ulcers have the highest incidence in persons under heavy emotional strain. Many executives who were examined were noted as nervous and high strung, physically and mentally exhausted, smoked too much, had not had vacations, etc. Smoking habits are discussed at some length. The question of the effect of tobacco on health is not absolutely proved, but the general evidence is that excessive smoking, at least, shortens life, and most executives smoke excessively. Excessive use of alcohol is not common among executives, and the effect of its moderate use is undecided. The author believes that more people die of excessive eating than of excessive drinking, and is more concerned with the abnormal conditions that lead to drinking than with its detrimental effect. Periodic examinations for all executives should be at least as thorough as those for workmen, and history and present habits should be carefully considered. Frequent short vacations are advised, rather than one long period, and they should provide real relaxation not strenuous golf games or driving. In the author's opinion the summer is the poorest time for vacation. In the present national emergency, speed must be increased even more, but there is no question that this speed will have deleterious effects. Moreover, the difficulties will not end with the war, and keen minds and sound bodies will be needed more than ever. Pauses for rest and relaxation are needed.
- 480 Reduction of Industrial Absenteeism by Preseasonal Immunization Against Catarrhal Illness. M.R. Brady. Am.J.Med.Sciences, 203, 469-473 (April, 1942).
In a large chemical factory 950 persons were inoculated with a mixed anti-influenza and common cold vaccine containing local strains. Absenteeism due to catarrhal illness in this group compared with an uninoculated group showed a reduction of 34.1% in the number of days lost. The total absenteeism from catarrhal illness in the factory in 1941 was compared with that of the previous year and a substantial reduction in the number of days lost was recorded. The rate of absenteeism per 1000 was recorded for 3 groups from January to March in 2 years and the peak absenteeism from catarrhal illness in each group was found to occur in February.

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- 481 Absenteeism in Fifteen Wisconsin Plants During 1940. Wisconsin State Board of Health. (1941).
Fifteen plants reported all disabilities of one day and over. An average of 6817 males and 675 females were included in the study. No salaried workers were included. The statistical analysis of this absentee data is presented in three different ways: (1) Frequency -- annual number of absences per 1,000 employees; (2) Disability -- annual days lost per 1,000 employees; (3) Severity -- number of days lost per case. Data is presented in the form of tables and charts which show the relative importance of the various causes of absence and the variation by month, sex, and department. Charts are also presented to compare the plants as to various causes of absence.
- 482 Disabling Morbidity Among Industrial Workers, Final Quarter of 1941. W.M. Gafarier. Pub. Health Repts., 57, 588-589 (April 17, 1942).
The final quarter of 1941 was marked by high incidences of bronchitis, diseases of the stomach except cancer, and appendicitis, and the rates for each of these causes are the highest yielded during the past 10 years. The following rates for the entire year are the highest in the 10-year period and are in excess of the 10-year average by the percentages given: pneumonia, 42; bronchitis, 33; appendicitis, 24. The rate for all disabilities, 101.8, is the highest recorded for the 10-year experience, the rate being 12% in excess of the 10-year mean.
- 483 Nutritional Fitness Surveys in Industry. C.O. Sappington and A.J. Pacini. Ind. Med., 11, 201-203 (May, 1942).
The next significant advance in industry is the improvement of the health of the worker through better nutrition and every indication suggests that the advance can outdo in economic advantages the tested and approved values derived from accident prevention. The first step in initiation of corrective measures is fact finding. A procedure for fact finding is suggested, including nutritional charts, record of worker's diet, checking weight and height, and use of a bio-photometer.
- 484 Industrial Hygiene and Occupational Diseases. Course Outline and Digest of Lectures given in Cooperation with the National Conservation Bureau. Center for Safety Education, New York University. Mimeographed, 200 pp. 1941. Price \$1.25.
This volume contains full outlines and abstracts of the course in Industrial Hygiene and Occupational Diseases, given at New York University in the Spring Semester of 1941. The course is divided into the following units, each corresponding to one lecture given by an authority in the field: (1) occupational diseases, their nature, incidence and prevention (an introduction to the course); (2) dusts; (3) metallic poisons; (4) toxic gases; (5) toxic organic solvents; (6) dermatoses and venereal diseases; (7) other factors affecting industrial health; (8) miscellaneous exposures and sick absenteeism; (9) air sampling methods and analyses; (10) occupational disease engineering control methods; (11) personal protection equipment; (12) ventilation; (13) plant surveys, industrial processes and operations; (14) legal phases and (15) medical control and industrial health education. Space does not permit abstracting the individual lectures, but the publication should be valuable for any school or organization giving similar courses as well as for reading for general information. Some of the individual lectures have been abstracted in this Digest.
- 485 The Background of Industrial Medicine. L. Vaccaro. Nat. Safety News, 45, 34 (May, 1942).
The earliest priest-physicians of Egypt practiced safety and industrial medicine as proven by the Edwin Smith papyrus. Dr. Vaccaro presents a review of ancient literature showing that the existence of occupational diseases was well known in ancient times.

- 486 Workers' Health Education. E. G. Pritchard. Am. J. Pub. Health, 32, 395-400 (April, 1942).

Health education for workers, and for adults in general, has lagged behind activities directed to health of infants and children. The average worker has very meager ideas about general health care, and he relies on patent medicine advertisements rather than sound medical knowledge. The need for health education is increasing on account of the aging of the population, but only a small number of employers are trying to meet it. Some government and other organizations have published some health information for workers, but it is limited in scope and not always in language that will interest those to whom it is directed. The author describes means now being pursued by the U. S. Public Health Service, especially by the distribution of a series of leaflets, covering 10 occupational hazards and 10 non-occupational diseases, written briefly in a style appealing to the average worker. The titles of those issued so far include "Leonard's Appendix and How it Burst," "KO by CO Gas," "Clara gives Benzol the Run Around." Copies are supplied free to state agencies and the others sold. In addition to the leaflets, posters, photographic exhibits, electrically transcribed radio programs and a motion picture are features of the general program.

- 487 Visiting Nurse Service for the Small Plant. L. Harmon. Ind. Med., 11, 238-239 (May, 1942).

The method of selection, routine performance, duties and aims of nurses acting under the plan of the Visiting Nurse Association are described. Nurses for particular plants are selected by the Association on the basis of experience and preparation. The nurses' duties vary somewhat with the size and nature of the plant, but in general include first aid to accidents occurring when she is in the plant, seeing all employees who were given first aid since her last visit, interviewing employees who have been ill, general observation of working conditions, cooperation with the physician and reports on the number of workers receiving her various services. Since the beginning of this program no plant has decreased the number of the nurse's hours or cancelled its contract with the Association. On the other hand the work has almost always increased in facilities and importance.

- 488 The Application of Mental Hygiene to the Problems of the Industrial Nurse. Meyer Brown. Ind. Med., 11, 97-100, (February, 1942).

One field in which the industrial nurse can be helpful is in the recognition and amelioration of slight mental disorders before they become serious. It must be recognized that such disorders are diseases and not occasions of disgrace. There are three types of mild disturbances: (1) the nervous or mental disorder which is not severe enough to require hospital care but which can become so if it remains untreated; (2) minor disorders which rarely becomes severe enough to require institutional care and which can be relieved wholly or in part by prompt and suitable medical care; and (3) those which show some emotional or mental maladjustments. The nurse can be of assistance with all three classes of patients and others with minor abnormalities by broadening her knowledge of psychiatry and by showing sympathy and understanding toward workers in the course of her treatment of physical injuries, and in general contacts.

- 489 Bulletin of the Czechoslovak Medical Association. Czechoslovak Research Institute, London. No. 1, 28 pp. 1941.

In this small pamphlet well-known experts give a good picture of work now being done in Great Britain by Czechoslovaks. It also includes an article by J. Loowy and W. Recht on health services in the Czechoslovak Republic during the 20 years of its existence. One object of the government has been the improvement of the health of laborers, and research on labor conditions has been conducted by government agencies and by the leading universities.

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