



FOUNDATION FACTS

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This news-letter is issued monthly to member companies and trade associations affiliated with Air Hygiene Foundation. Its purpose is to report Foundation news and activities. Air Hygiene Foundation is a partnership of industry and science organized to protect the health of the 15 million workmen in heavy industry.

Vol. 3.

July, 1941

No. 7.

BULLETIN

Name Changed to "Industrial Hygiene Foundation"

The Board of Trustees of Air Hygiene Foundation of America, Inc. announces the change of the organization's name to Industrial Hygiene Foundation of America, Inc. At the same time the Foundation, originally incorporated in Ohio in 1935, was reincorporated under the laws of Pennsylvania. Foundation members voted almost 4 to 1 in favor of the name change in a poll conducted some months ago. After this expression, legal steps were started and the charter was granted on July 23 in Pittsburgh. Reason for the name change is to more clearly describe the Foundation's expanding activities and membership services for the protection of employee health.

From the Foundation was organized emphasis was placed on silicosis, No. 1 industrial health problem at that time. The Foundation's scientific approach to that problem is credited with having helped calm the hysteria then rampant. With the rapid advances of industrial hygiene and the multiplication of new occupational health problems, the Foundation's work has naturally broadened.

A study is now underway, with the collaboration of the U.S. Public Health Service, to help reduce sick absenteeism which is costing the heavy industries alone about one billion manhours yearly. Other accomplishments include, continuing studies of X-ray techniques for large-scale physical examinations in industry; studies of the control of toxic fumes and gases, including proper precautions in welding; a research, now in progress, to develop further practical data on exhaust ventilation for employee health protection; investigations in "protector" dusts, including aluminum, to combat dust diseases.

A "storehouse" of industrial health literature has been built up at the Foundation's headquarters in Mellon Institute. Current literature is digested each month for the information of the members and to keep them posted on progress. This digest covers about 300 journals in a dozen languages. Industrial hygiene laboratory facilities are also maintained at Mellon Institute. The Foundation now has industrial hygienists spending most of their time in the field making surveys for member companies. These surveys show the presence or absence of potential health hazards. Where hazards are found, remedies are recommended.

Advances in technology plus defense-spurred production are increasing old health hazards and creating new ones. The Foundation's function is to help keep precautions abreast with production for its member companies and their million workmen.

Sixth Annual Meeting - Nov. 12 and 13

The Foundation's sixth annual meeting will be held at Mellon Institute, Pittsburgh, on Nov. 12 and 13. The program geared to produce practical data for today's needs, will revolve around the theme: Defend the Defense Worker! Program suggestions are now being received from members of the Board of Trustees and the Medical, Engineering, Legal and Membership Committees. Members are cordially invited to submit suggestions. Meanwhile, reserve Wednesday and Thursday, Nov. 12 and 13. Increased production increases health hazards.

PLAINTIFF'S
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Foundation Facts --- 2.

Half A Million Workers "AWOL"

Business and government report "Labor requirements are constantly climbing" --- defense production requirements had mounted last month (June) to 44 billion manhours, a jump of 16 billion since January -- a recent survey showed "Serious shortages of qualified workers in important shipbuilding, aircraft and machineshop operations."

Yet, about one billion manhours will be lost this year in the heavy industries alone through sick absenteeism! That is equivalent to half a million workers in the industrial army leaving the lines being "AWOL" from the all important task of preparedness production. To compensate for sick absences additional manpower must be secured or production lags. But such additions would not be practical, even if the necessary workers were available, since absences can't be foretold. Therefore----

Larger companies are urged to take every possible precaution to combat the health hazards that increase with increased production. The average worker is losing about 8 days a year because of illness. For every day that figure can be reduced there will be a gain of 120 million manhours equivalent to the services of 60,000 workers full time.

The Foundation's function is to help its members Defend the Defense Workers. The "helps" are summarized in the attached memo to members.

A construction job that does not include health protection is not a finished job. It is easier to change plans than plants. The Foundation can help companies "build in" precautions. Ask for information.

William S. Knudsen---"Safeguarding the health of our employees is, in my opinion, the greatest and most important task before us at all times."

Defend the Defense Worker!

Increased Production Means Increased Health Hazards, So ---

This memorandum is to advise you of the services for protecting employee health which are available through Air Hygiene Foundation, a strictly non-profit association of industrial concerns with headquarters at Mellon Institute, Pittsburgh. Most important of these services now are the Industrial Hygiene Surveys. The surveys, conducted for member companies at cost, disclose the presence or absence of occupational health hazards, such as, excessive silica dust, lead, chemical fumes, gases, skin irritants, etc. If hazards are found remedies are recommended. Surveys help protect companies against unjust claims which flourish in depressions. Other services include:

Medical and Engineering Research on industrial health problems is conducted at the Saranac (N.Y.) Laboratory, Harvard, Pennsylvania and Mellon Institute. Members share in the economy and results of mutually-supported investigations.

Plans for new plants, designs for exhaust ventilation, materials used in manufacturing, etc., are checked for health significance -- a double safeguard.

Sick Absenteeism studies help reduce the losses suffered by management and labor through illness. This practical plan audits absences and shows when-where-and why they occur. Sickness causes 13 times more absences than accidents.

A Digest of Industrial Hygiene literature is prepared for members each month. This "news service" covers about 300 journals in a dozen languages. It reduces hours of reading to minutes, keeps companies posted on progress.

Informative Bulletins are issued periodically giving practical plant data for conserving health, Use and Care of Respirators, Design of Exhaust Systems, Determination of Lead, Benzol, Industrial Dusts, Choice of Methods for X-ray Examinations, and legal bulletins on occupational disease laws and compensation.

Counsel on medical, engineering and legal problems is available within reasonable limits from specialists comprising the Foundation's professional committees.

Facilities include an industrial hygiene laboratory and hygienists at Mellon Institute plus an exhaustive library. The Foundation also works in close cooperation with the Department of Industrial Hygiene at University of Pittsburgh's School of Medicine, the U. S. Bureau of Mines, the U. S. Public Health Service and the research institutions listed above.

Tangible and Intangible assets include, lower compensation costs, less litigation, improved working conditions, improved employer-employee relations, public goodwill and even less spoilage and increased production.

Increased production demands increased precautions.
The Foundation helps provide the precautions.

July, 1941.

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

DIGEST OF INDUSTRIAL HYGIENE
Literature--News--Developments

News Items

534 Prevention of Heat Sickness in Industry.

Attention to the use of salt in preventing heat sickness or heat cramps is now timely. Salt lost from the body through perspiration may be conveniently replaced by adding salt to the drinking water (0.5% or two heaping teaspoons per 10 quarts) or by supplying salt tablets near the drinking fountain. A number of reports state that the proper use of salt has practically eliminated heat cramps and heat sickness. The only possible harmful effects from moderate use of salt are in cases of heart or kidney disease, but distress and gastro-intestinal disturbances may result from excessive and erratic use of salt tablets by sedentary workers. Connecticut Health Bull., 55, 173, (June, 1941).

535 Office of Scientific Research and Development Established.

The Office of Scientific Research and Development has been created by President Roosevelt by Executive Order dated June 28, as a branch of the Office for Emergency Management. The functions of this Office are: (a) to advise the President concerning the status of scientific and medical research relating to national defense and the measures necessary to assure continuing progress in this field; (b) to serve as the center for the mobilization of the scientific personnel; (c) to coordinate, aid, and supplement the scientific and medical research activities of the Navy, War and other departments; (d) to develop broad and coordinated research plans, in collaboration with representatives of those departments. The fields of research include mechanisms and devices of warfare and medical problems affecting national defense. An important branch of the Office is a Committee on Medical Research, whose special function is to advise concerning the need for and character of contracts to be entered into with universities, hospitals, and other agencies conducting medical research activities; also to make findings and submit recommendations with respect to the adequacy, progress and results of research on medical problems related to national defense. Defense, p. 8 (July 9, 1941).

536 Safety Training Supervisor Appointed.

Laurence B. Tipton of Rutgers University was named by Secretary of Labor Perkins as Safety Training and Field Service Supervisor for the National Committee for the Conservation of Manpower in Defense Industries. This Committee was set up last June by Miss Perkins to provide safety advisory service to Government contract plants, and to aid in the speeding up of the National Defense program by keeping skilled and trained workers off the casualty list. Mr. Tipton will work with defense agency officials on safety training programs for workers and supervisors and will have the responsibility for the organization and development of

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programs for Defense Safety Engineering training at college level in principal industrial centers. Intensive courses in safety engineering, industrial hygiene, occupational disease and industrial accident prevention will be offered. U.S. Department of Labor release.

Legal Developments

537 Occupational Disease Statute Held to Apply to Disease Contracted Prior to Effective Date of Act.

The employee in this case became affected with a disease of the bronchia tubes known as bronchiectasis due to fumes and dust inhaled in the course of his employment. The Workmen's Occupational Disease Act of Indiana was passed in 1937. The employee was engaged in the employment in which he incurred his disease prior to that time. The contention was made that no award should be granted because the disease was contracted before the Act became effective. The Court rejected this contention. It stated that the Act provides for compensation for disabilities resulting from occupational diseases, and not for contracting such diseases. Although the employee may have contracted the disease before the Act was passed, he did not become disabled from the disease until a year after the effective date of the Act, and consequently he came within its provisions. Hirst vs. Chevrolet Mfg. Co. of Gen. Motors Corporation (Indiana) 33 N.E. 2d 773 (May, 1941). Occup. Hazards, 3, 28 (July, 1941).

538 Compensation Granted for Mercurial Poisoning.

The claimant was engaged as a hatter for some time prior to October, 1931. His work required him to handle and come in contact with furs. These furs were treated with mercury. The claimant exhibited symptoms which included a toxic mercurial dermatitis, nervous manifestations which recurrently flared up acutely; marked tremors and general nervous and mental symptoms. The Court found that the claimant was suffering from, and totally disabled by mercurial poisoning, a compensable occupational disease under the New Jersey Compensation Act. The disease was found to have been contracted while in the course, and by reason of the claimant's employment, and an award for his disability was allowed. Borowitz vs. Rothenberg Hat Co. (N.J.) 18 att. 2nd 852 (March, 1941). Occup. Hazards, 3, 24 (July, 1941).

539 Bursitis Compensable as Occupational Disease.

The claimant's work consisted in pouring medicine into bottles and pasting labels on the bottles. She was employed for nine years prior to June, 1939. Previous to 1938 she did her work by pouring the medicine from a graduate which she held in her right hand. In 1938 a machine for filling and labeling the bottles was installed. The claimant placed the bottle in the machine with her right hand and took them off with her left. In 1935 her right shoulder began to hurt. In 1937 it grew worse, and in June 1939 she was found to be suffering from bursitis. Bursitis is a specified occupational disease under the Michigan Compensation Act when it is caused by a process involving continuous rubbing, pressure or vibration of the parts affected. The Court held that the facts in this case justified an award. Three judges dissented on the ground that bursitis is not an occupational disease in the occupation of filling and labeling bottles; that the process required under the act did not include the process used by the claimant in this case. Kalee vs. Dewey Products Co. (Mich.) 206 N.W. 826 (March, 1941). Occup. Hazards, 3, 24, (July, 1941).

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540 Complete Recovery from Occupational Disease. Inability to Return to Same Occupation. Right to Compensation.

The question is whether the minimum compensation rate of \$8.00 per week contained in Workmen's Compensation Law, Sec. 15 subd. 6 applies to an employee who had fully recovered from an occupational disease but who to avoid recurrence is unable to return to her former occupation and whose wage earning capacity in her new occupation is less than it was in her former occupation. The portion of the Workmen's Compensation Law dealing with occupational diseases is found in Art. 3. Sec. 39 of such article treats of disability or death caused by occupational diseases. The method provided in Sec. 39 would give her compensation at the rate of \$7.45 per week. Consequently the board erred in applying the minimum rate of \$8.00. The findings do not show the amount of reduction in earning capacity, nor the actual earning capacity of the claimant after her recovery. Such failure compels us to reverse this award and remit the matter for the preparation of proper findings. The award is reversed and remitted. Matter of Spang. N.Y. Supreme Ct., App. Div., 3rd Dept. Decided July 2, 1941. (CCH).

541 Pneumoconiosis. Resulting Tuberculosis. Improper Ventilation. Negligence of Employer.

Appellant charges that he became afflicted with pneumoconiosis, and in addition thereto that by reason of the weakened condition of his respiratory tract he also contracted tuberculosis. The court directed a verdict for the defendant. Any occupational disease which is the proximate result of the negligence of the employer is actionable and any occupational disease which is not the proximate result of the negligence of the employer is not actionable. Appellee contends that appellant failed to prove appellee guilty of negligence proximately causing the disease with which appellant is suffering. The evidence shows that appellant worked in the same room under the same conditions for seven years, at an emery grinding machine which never at any time was equipped with any kind of blower system or exhaust fans to carry off the dust. The dust was thick. No windows or ventilation of any kind existed. The medical testimony was that pneumoconiosis is a lung disease caused by dust, one form of which is silicosis which results from breathing dust containing silica; and that appellant is permanently and totally disabled by reason of the disease. Judgment reversed with instructions to sustain appellant's motion for a new trial. Dean v. The Dalton Foundries, Inc. et al. Ind. App. Ct. Decided May 27, 1941. (CCH).

Papers on Dust, Gases and General Industrial Hygiene

- 542 Pneumoconiosis in Coal Trimmers. J. Cough. J. Path. & Bact. 51, 277-85 (1940). The autopsy findings in 12 Cardiff steam coal trimmers are reported together with their clinical histories. All showed evidence of pneumoconiosis and 5 had died of this disease. The pulmonary fibrosis was of two types, massive and nodular. The nodules differed from those of classical silicosis in being less densely fibrous and in showing radiating rather than concentric fibrosis. The lesions were similar to those found in miners working at the coal face in the mines from which the coal was obtained. While the residual silica was not high, the author feels that it played a part in the lesion. In his opinion Cardiff coal trimmers with prolonged exposure to sufficiently high concentrations show a pneumoconiosis similar to that recognized as anthracosilicosis in coal miners.

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- 543 Artificial Respiration and Inhalation. Y. Henderson and J.M. Turner. J.Am. Med. Assoc., 116, 1508-14 (April 5, 1941).

All the manual methods of artificial respiration, as tested on conscious persons, induce the same volume of pulmonary ventilation. The principles controlling the volume are essentially the same as in ordinary breathing, namely the amount of carbon dioxide and oxygen in the blood acting on the respiratory centers which in turn influence the tonus, the diaphragm and thoracic muscles. The inhalation of carbon dioxide increases the volume of pulmonary ventilation with manual artificial respiration. It has been shown that the efficiency of manual artificial respiration is greatly increased and the patient is more rapidly resuscitated when carbon dioxide and oxygen are added to the air supply. Their presence is particularly necessary in treatment of carbon monoxide poisoning, in addition to immediate and constant respiration, so that sufficient oxygen is supplied and elimination of the carbon monoxide fixed to the hemoglobin is accelerated. Mechanical breathing machines not using positive pressure, such as the Drinker respirator, also depend upon control of pulmonary ventilation by the carbon dioxide and oxygen contents of the blood, and do not cause over or under-ventilation. Positive and negative pressure machines, on the other hand, are no better than manual methods in operation, and as a matter of fact, are very frequently distinctly harmful. These harmful effects result from: (1) loss of time in applying the apparatus, a difference of one minute being important; (2) lack of synchronization between the natural breathing and mechanical rhythm, thus actually impeding ventilation; and (3) possibility of overventilation, with a train of deranged physiological phenomena, often leading to death. The pulmotor is severely condemned by the authors.

- 544 Industrial Health Practices. A Report of a Survey of 2,064 Industrial Establishments. Conducted by National Assoc. of Manufacturers, Committee on Healthful Working Conditions, under direction of V. G. Heiser. 76 pp. (May, 1941).

A questionnaire was sent to each of 4,500 industrial companies, in order to obtain previously unavailable information about the value of maintaining health programs, to investigate prevailing policies in industry regarding physical examinations to determine the frequency of specified services in industrial health programs, and to ascertain the age of factory health programs and the incidence of size and type of industry on the annual per capita costs of such services. There were 1,500 replies received, covering 2,064 plants employing 1,945,551 workers. The summary reveals that a health program saves the average 500-employee plant \$5,311 per year. All but 5 of a total of 1,625 respondents considered their programs paying propositions. Over 90% of those replying indicated reductions in accident frequency (44.9%), occupational disease (62.8%), absenteeism and compensation insurance premiums (about 29% each). A slightly smaller percentage indicated reductions in labor turnover, amounting to 27.3%. Most concerns use physical examinations as a means of determining proper placement of employees but do not unwarrantedly discriminate against applicants on the basis of the results of these examinations. Only 4.4% of applicants in 1,134 plants were rejected on account of shortcomings disclosed by the examinations. Eighty percent of 1,388 plants reporting their policy have a system of rating examinees for jobs. In 41% of 1,435 plants, including all organizations employing 20,000 or more, physical examination records are kept confidential. Among 23 specified items listed as important components of a factory health program, over 80% of the 2,064 plants in the survey provide an accident prevention program, exhaust ventilation, and a plant housekeeping and sanitation program; 70-80% pre-employment examinations of factory employees, 60-70% full illness and absence records, 40-50% periodic checks of examinations of factory employees and, 30-40% health education and presence of a doctor at scheduled hours. Forty-three per cent of the plants reporting had established their health services

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during the past depression decade and 70% of those established during the past 5 years were in plants having less than 500 employees. An average per capita cost of \$5.17 was reported for plant medical programs, \$3.34 for safety programs, and \$3.41 for industrial hygiene programs. The per capita cost of medical programs decreases as the number of employees increases. In addition to more detailed presentation of this material, several appendices contain a copy of the questionnaire and detailed tables of data from the replies.

- 545 Physical Fitness. E. Jokl and E.H. Oliver. J.Am.Med.Assoc., 116, 2383-9 (May 24, 1941).

The results of the investigations by the authors are a challenge to the conventional methods of determining fitness and employability. A sample group of 32 young men in South Africa were unable to obtain or retain employment, although they had all received primary education and were free from all diseases which would brand them "defective" according to all standards established by labor and recruiting officials and the medical corps. The reasons for their condition were demonstrated by physical performance tests to be low strength and skill, due to poverty and consequent unsatisfactory diet, bad housing and poor general standard of living. Their physical condition and failure in work resulted in dullness, bitter mental attitude and lack of initiative. A special camp was established under the direction of the South African Defence Force for the purpose of training young men suffering from the handicaps described. The men underwent a six months course of training under military discipline, with stress on physical training and drill. Physiologic, postural, anthropometric and physical performance tests, made frequently, showed a rapid rise toward normal levels, and the men's mental attitude improved likewise. Suitable employment at normal wages was provided for 90 per cent of the men thus trained, and an analysis of pay sheets for a sample group of these workers for four years showed that they had achieved full economic rehabilitation. The authors also conducted an extensive study of the growth in physical efficiency of a group of children between 5 and 20 years of age, including English, Afrikaner, Jewish, Bantu, Cape Colored, Indian and Chinese. The similarity between standards of physiologic performance of the different racial groups was striking. The effect of puberty on the growth of physical efficiency is noteworthy. It is desirable to collect more evidence on the relationship between subclinical nutritional deficiencies and physical efficiency. The terms "fitness" and "efficiency" generally very loosely applied, should be considered with the question "fitness and efficiency for what?" To illustrate this point, the authors cite instances of remarkable athletic ability in specialized fields, in persons with severe physical defects, some evident at once and others discovered only after death. The authors believe that the only satisfactory measure of fitness for employment is physical performance, and predict that theories and concepts of physical fitness will change when more physiologic and clinical experiences in this field are presented in the medical literature.

- 546 Briggs Never Stops Fighting Occupational Diseases. R.G. French. Amer. Business, 11, 18-9, 48-9 (April, 1941).

This is an account of the experience of the Briggs Manufacturing Company in combating occupational disease. In the plant with 20,000 employees, two physicians, two technicians and one chemist devote their full time to hygiene. All new materials are examined for toxic constituents. Lead dust, mostly from grinding operations, is removed by a push-pull ventilating system, and all the usual precautions against lead poisoning are observed, an aid to which is a printed employee's handbook containing all rules. Air samples are taken frequently. Special allergies are noted, and analysis for possible sources of dermatitis and change of occupation for sensitive persons has reduced such trouble to a minimum.

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The physical examination program includes watching for communicable diseases and preventing contagion. The program has repaid the company in maintaining health in the city, in promoting steady employment, in contributing to a better product and in providing insurance against the possibility of occupational diseases.

- 547 Absenteeism in Industry. R.D. Mudd. Trained Nurse & Hosp. Rev., 106, 344-50 (May, 1941).

The problem of absenteeism is fully discussed with reference to (1) general importance, (2) records, (3) distribution and (4) control. The gravity of the problem is now increasing on account of national defense. The author feels that it is important to record every absence regardless of its length. Every absent employee should be interviewed by a nurse or doctor prior to his return to work. The records should be complete and should be recorded on a master sheet in addition to individual records so that they can be studied monthly or yearly. Distribution of absences according to a number of factors is discussed fully with the aid of data and charts compiled by W.G. Hazard of Owens-Illinois Glass Co. The records show that 86.6% of all absences are of less than 8 days duration, and 71.1% less than 4 days. Although the short absences comprise a small percentage of total time lost, they should receive full consideration, on account of possible contagion, especially in respiratory affections, turnover and expense to the employer. Not more than 1% of absences are due to diseases legally classified as occupational, and absences on account of non-industrial accidents are 6 to 10 times more frequent than those caused by industrial accidents. Absences increase slightly in frequency with age, but the length of disability increases in a greater ratio. The following factors in control of absenteeism are discussed: (1) amount of absenteeism; (2) occupational exposures; (3) physical examination; (4) medical and surgical first aid; (5) control by private physicians; (6) control in small industries; and (7) reporting to established agencies. The nurse and physician can and should exert an influence on lowering absence rates. The more absences are checked, the fewer there will be. Proper supervision of safety and of health hazards lead to greater care at home and elsewhere as well as at work. Physical examination and records associated with first aid treatment disclose conditions that will guide the private physician in correcting them. The private physician should return the patient to work the day he is well, and in the author's opinion insurance for Sunday disabilities should be discontinued, decreasing the number of absences between Thursday and Saturday. Visiting Nurse Associations for small plants, and cooperation with State and National agencies in reporting absences, are recommended.

- 548 State of Maryland, First Annual Report of the Medical Board for Occupational Diseases, Industrial Accident Commission, for the Period June 1, 1939 to October 31, 1940, Inclusive. 75 pp. and 10 unpagged tables. 1940.

This report presents a complete analysis of the 391 claims filed with the Maryland Medical Board for Occupational Diseases, during the given period. They are classified according to occupation, industry, type of disease, and disposition of the claim. Of the total of 334 claims that were awarded, 186 were for dermatitis, 70 for disabilities from blisters or abrasions, 35 for bursitis or synovitis, 13 for lead poisoning or its sequelae and 1 for silicosis. The tables are followed by digests of the 36 claims that were formally brought before the Medical Board.

- 549 Neuropathologic Syndromes after Electric Trauma with a Note on Late Sequels. F. Scheiffahrt. Dtsch. Ztschr. f. Nervenheilk. 151, 153-70 (1940). (German). The author reports several cases of after-effects of electric shock on the nervous system. The symptoms are quite varied in the different cases, but all can be considered as indicating damage of certain sympathetic ganglions or "vegetative paralysis."

- 550 A Chemical and Physiological Investigation of Electric Arc Welding. III. Coated Welding Rods. C.P. McCord, G.C. Harrold and S.F. Meek. *J. Ind. Hyg. & Toxicol.*, 23, 200-15 (May, 1941).

In continuation of their work on electric arc welding (Abstracts No. 783, November, 1940 and 436, June, 1941), the authors now report their results on coated rods. Rod coatings vary materially in composition and some with the simplest composition were used in the experiments. The principal elements found in the coatings and fumes, in addition to those from the bare rods, were silicon and titanium. The quantities of nitrous gases and ozone in fumes from coated rods were lower than from bare rods, but the metallic fumes (iron and manganese) were much more abundant, especially the manganese. The animals (rabbits and albino rats) were exposed for 6 hours daily for 46 days out of a total of 64 days, the fumes from welding 12 minutes at half-hour intervals. Contrary to findings from bare rods, growth rate disturbances were encountered. Substantial quantities of methemoglobin were found in the blood of exposed rats, and its presence was established in the blood of welders. A few additional experiments on bare rods also disclosed methemoglobin in the blood of the rats. As in the case of bare rod experiments in which large quantities of nitrous gases were evolved, no evidence whatever accrued relative to pulmonary edema, severe respiratory tract inflammation or similar findings, traditionally associated with nitrous gas action. Rats injected intraperitoneally with welding fume dust exhibited inert reactions, while those injected with silica dust presented characteristically proliferative reactions.

- 551 Nystagmus in the Dutch Coal Districts. Economic Factors and Photometric Investigations. J.W.C. Verhage. *Optica*, 100, 266-76 (1940). (German).

The author presents statistics on nystagmus in the Dutch coal mining areas and shows that the number of declarations of work disability is influenced by the economic situation. The most probable cause of nystagmus is defective illumination, photometric measurements were made in the mines under various types of illumination. Results showed that the cap lamp is the best illuminant.

- 552 An Automatic Carbon Disulfide Recorder. Ben E. White and W.R. Calvert. *J. Ind. Hyg. & Toxicol.*, 23, 196-9 (May, 1941).

A simple and inexpensive carbon disulfide recorder is described. It is based on colorimetric analysis of carbon disulfide with copper acetate and diethylamine in methyl cellosolve. When hydrogen sulfide is present it is removed by passing the air through alkaline cadmium chloride before it enters the absorption cell. Two Zenith pumps, which are generally available in rayon plants, may be used, one to handle the absorbing liquid and the other to force the air through the liquid. Use of this recorder obviates the need of routine manual sampling, and it gives a permanent record of the carbon disulfide concentration at all times.

- 553 Effective Temperature Scale. A Measure of Human Comfort in Environmental Temperature. M.B. Farderber and F.C. Houghton. *J. Am. Med. Assoc.*, 126, 474-7 (February 8, 1941).

This is a review of the effective temperature index and its application to ordinary living and working environments in winter and summer.

- 554 Adsorption of the Early Products of Bovine Tubercle Bacilli in Rabbits by Anthracite Dust. S.L. Cummins. *Brit. Med. J.*, pp. 623-4 (1940).

The author has devised a method of intratracheal inoculation of an emulsion of living extremely virulent bovine tubercle bacilli, and the same emulsion with 0.2 g. of anthracite dust. The addition of the dust led to the survival of 5 rabbits, considerably longer than the controls (116 vs. 75 days) and to complete recovery in 1 to 6 months.

- 555 Dust-Explosion Hazards in Plants Producing or Handling Aluminum, Magnesium or Zinc Powder. H.R. Brown. Bur. of Mines Inf. Cir. No. 7148, (March, 1941). This paper presents a review of the knowledge of the explosibility of aluminum, magnesium and zinc dusts, including the uses and manufacture, ignition temperatures, pressures developed, etc. At least 45 explosions of these dusts occurred from 1917 to 1939, including 12 in the last five years. They will probably be more frequent now, owing to the great increase in production. Water cannot be used to extinguish fires, as the dusts react with water. Extinguishers that disperse the dusts, thereby creating new and dangerous clouds, are also ruled out. The only method available is to isolate the fire and let it burn itself out, or to use inert dusts if the fire is small. The best protection lies in fire prevention, which must be emphasized in plants. Cleanliness must be observed, the dust must be kept dry, and flames and smoking must be prohibited. If heating is necessary, hot air should be introduced from outside the building. All machinery must be grounded so that static electricity does not accumulate and electric wiring must be of an approved type. The powder making section of the plant should be segregated and divided into small units, one story with roofs that lift easily. Supplies of dry sand, talc or a similar extinguisher should be kept ready in suitable locations, and fire companies should be warned not to use water in case of fire. Additional research should be carried out as soon as possible, as much remains to be learned about the explosibility of these dusts.
- 556 Rational Placement of Workmen in Industries: Examination of Physical Defects and Morphological Changes. G.A. Vignani. *Rass.Med.Ind.*, 10, 219-39 (1939); (Italian). A discussion of the defects and changes which limit the possibilities for a choice of work, with special consideration of the occupations open to persons suffering from changes in the cardiovascular apparatus, arterial hypertension, and chronic affections of the respiratory apparatus and of the digestive system.
- 557 Parallel versus Individual Operation of Multicyclones. L.C. Whiton, Jr., *Trans. Am. Soc. Mech. Eng.*, 63, 213-8 (April, 1941). Tests were made on cyclone dust collectors singly and grouped with interconnecting ducts and hoppers. Results show that, with a damper-equipped cyclone of the type used in actual practice and operated under identical conditions of resistance and temperature, performance of the individual cyclone is representative of the group in the field. In the discussion following the paper, it was agreed that this conclusion should not apply to groups of more than 3 cyclones in parallel.
- 558 Industrial Air Analysis. A Description of Some of the Chemical Methods Employed in the Laboratory. W.J. Burke and others. N.Y. State Dept. Labor, Div. Ind. Hyg., Mimeographed, no date. Various instruments are described, and chemical and physical procedures are presented, for laboratory and field analyses of air. Specific methods for determining the following substances are described: lead, zinc, and copper (alone or in combination), mercury, carbon monoxide, benzene, hydrogen sulfide, carbon disulfide, formaldehyde and halogenated hydrocarbons. Methods are also given for determination of combustible limits of various gases and gravimetric estimation of organic vapors when present singly or in known proportions. The physical methods include adsorption of organic vapors on charcoal, silica gel, etc., absorption of vapors and gases in liquid media, and various instrumental methods such as the carbon monoxide, hydrogen sulfide and combustible gas indicators, the Nordlander and Woodlander mercury vapor detectors and the Tebbens combustion apparatus for chlorinated hydrocarbons. The methods given are supported by references and experimental data which should be of great value to the industrial hygienist.

workers in the Chicago district, selected to form a comparable age group, were studied as controls. The data, classified according to age, occupation, and number of years employed, are presented in a number of tables and charts. The comparison indicates a tendency of bituminous miners to develop presilicotic lung changes after prolonged employment. At the mine where the study was made 2% of the workers showed presilicotic changes and 1% showed nodulation in their chest roentgenograms. These changes occurred principally among undercutting machine operators and coal loaders. The shortest exposure period necessary to produce nodulation was observed in a rock driller who had worked at his trade 11 years.

- 565 Hydrogen Sulfide Poisoning in Cleaning Sulfuric Acid Tanks. T. Bauer and H. Berger. Arch. f. Gewerbepath., 10, 259-87 (1940).
 Arsine poisoning occasionally occurs in cleaning sulfuric acid tanks of trucks. Two serious poisonings (cases), one fatal (Abstract No. 860, December, 1939), followed cleaning such tanks. In the fatal case, examination of the tank air showed nothing, but after stirring the tank residue, the air contained 98 mg. of hydrogen sulfide and only traces of arsine. The author (Bauer) concludes that death was caused by inhalation of hydrogen sulfide, probably caused by reduction of the ferric sulfate to ferrous sulfide by acid in the residue, followed by action of the acid on the sulfide. Berger disagrees with Bauer regarding the cause of the presence of the hydrogen sulfide, attributing it to action of the acid on thioarsenite formed from the arsenic trisulfide present in the residue and the sodium carbonate used to clean the tank. In reply, Bauer defends his own interpretation, but both agree in general on preventive measures, including: avoiding the introduction of organic material, removal of as much as possible of the residue, neutralization of the remainder with soda, filling the tank twice with fresh water, and working only with a compressed air helmet or with plenty of fresh air. Tests should be made for arsine, hydrogen sulfide, and nitrous fumes.
- 566 Chronic Hydrogen Sulfide Poisoning in Dogs. F. Moser. Arch. f. exp. Path. u. Pharm. 194, 443-54 (1940).
 Hydrogen sulfide was inhaled by dogs for 7 hours daily, first 0.014 mg. per l., and later 0.15 mg. per l. At the lower concentration the dogs showed little change; at the higher concentration there was tachypnea, coughing and coryza. The animals were quieter than usual and displayed a form of nausea, especially on leaving the exposure chamber. No blood changes or loss of weight occurred. Two of the dogs had diarrhea and one died showing pulmonary edema at autopsy. In fatal human cases, almost the only symptom found has been lung edema.
- 567 The Dust Retaining Ability of the Nose in Asbestosis. W. Ehrhardt. Arch. f. Gewerbepath., 10, 309-25 (1940).
 The author examined the dust-retaining ability of the nose in 238 asbestos workers, using Lehmann's method. No constant relation between this ability and tendency to asbestosis could be discovered. The dust-retention capacity was below 40% in several men who showed asbestotic lung changes, but many others remained healthy in spite of a similar low capacity. The two men with severe asbestosis had a good dust retaining capacity. The author concludes that this test has no essential value and may be abandoned in pre-employment examinations of asbestos workers.
- 568 Radiation as a Factor in the Sensation of Warmth. F.C. Houghten and others. Heating, Piping & Air Cond., 13, 123-34 (February, 1941).
 Tests were made in two identical experimental rooms, one heated with ordinary radiators and the other with warm air. The former was comfortable at an effective temperature about 1° lower than the latter, but the structural heat loss of the room heated by the radiator was 8% higher than the other.

- 569 A Diving Apparatus for Life Saving Work. C.J. Lambertson. J.Am.Med.Assoc., 116, 1387-9 (March 29, 1941).

The author describes an apparatus designed primarily for underwater rescue work, but applicable also for work in toxic atmospheres. A small tank for oxygen or nitrogen-oxygen mixture and rebreathing apparatus are carried on the worker's back. In front is a soda-lime container, and flexible tubes run from the partial face mask to the container and to the oxygen tank. A leather harness attached to the assembly has hooks for attaching weights if desired. Oxygen flow is regulated so that 2 liters per minute at atmospheric pressure is delivered for 25 minutes.

- 570 The Effect of Hypoxemia on Ventilation and Circulation in Man. E. Asmussen and H. Chikara. Am. J. Physiol., 132, 426-36 (March 1, 1941).

Lowered oxygen content of the blood was induced in 3 men by partial carbon monoxide poisoning or by breathing a gas mixture poor in oxygen. The effects of lowered oxygen content of the blood, due to lowered carrying capacity and of lowered alveolar tension, were quite different. Lowered oxygen content caused no significant change in respiration or in cardiac output, while lowered tension caused a pronounced increase in ventilation and increase of cardiac output. These results are taken to indicate that the oxygen tension in the carotid body is the most important influence in inducing the change. Lowered oxygen content was followed by acceleration of the heart rate, which is explained as a compensation for the diminished stroke volume (consequent) on capillary dilatation.

- 571 Air-Supplied Masks for Spray Painting. H. Bertram. Arbeitsschutz pp. 291-2 (1940). (German).

The need of personal protection in addition to local exhaust ventilation in paint spraying is emphasized. The two air-supplied masks most used in Germany, the Auer and the Draeger, are described, with illustrations. A belt at the waist has openings connecting with the compressed air supply and with the half-mask. A filter for the compressed air and a connection for supplying 2 or 3 workers are also provided.

- 572 A Study of the Nature, Growth and Control of Bacteria in Cutting Compounds. M. Lee and A.C. Chandler. J. Bacteriol., 41, 373-84 (March, 1941).

There is ample opportunity for bacterial infection from cutting oil through various contacts as it circulates through a plant. Although the authors do not regard infection as the primary cause of the skin affections observed, they tested the oil for bacteria. Counts ranged from 14½ million per cc. after 2 hours use to 25 million after 200 hours' use. All the bacteria seemed to belong to the genus *Pseudomonas* but are apparently of a new species, for which the authors propose the name *Oleovorans*. Laboratory trials of various coal tar disinfectants and other materials controlled the growth for only a day or so. Finally resorcinol was found to be effective. No bacteria were found after 24 hours, and freshly added bacteria were destroyed. A 1% solution seems to give complete sterilization and does not affect the oil, while a smaller amount prevents spoilage. No investigation of the effects on workers is reported.

- 573 Experimental Research in Workers in the Manufacture of Dry Batteries. E. Zanetti. Med. del Lavoro 31, 276-81 (1940). (Italian).

The author presents his results of examination of workers employed in making dry batteries (see Abstract No. 311, April, 1941). He found very few symptoms, and no characteristic ones, of manganese poisoning. In the blood of some workers he found no changes in the blood calcium or potassium, but small changes in the glutathione content.

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- 574 Size Determination of Invisible Particles. H. Halberstadt. Staub, No. 13, 151-79 (1940).

The author describes the x-ray method of size measurement of ultramicroscopic particles, including its theoretical basis, different ways of performing the examination, and the accessories employed. The electron ray method, similar to the first is described briefly. The electron microscope is merely mentioned; it is available in only a few laboratories.

- 575 Engineering Control of Dust with Special Reference to Respirators. A.D. Brandt. Bull. Am. Ceram. Soc., 20, 1-56 (April, 1941).

In this paper, presented before the American Ceramic Society, the author reviews the usual methods of dust control, with a brief description of the various types of respirators and recommendations for their care and maintenance.

- 576 The Occurrence of Silicosis and Silicotuberculosis among Cast-iron Cleaners at the Soederfors Iron Foundry. S. Hedenstedt. Acta Tuberc. Scand., 14, 265-76 (1940). (Scandinavian).

Among 30 foundry workers, there were 16 cases of silicosis and 2 cases of silicotuberculosis. Incubation period was approximately 5 years. Masks were worthless. Indirect measures such as ventilation systems were more effective. Dyspnea may be slight while lung pathology is extensive. Increased red cell sedimentation rate is due to bronchitis. All cases were tuberculin positive. Physical symptoms either are absent or are not pronounced. Only in 2 cases were workers entitled to health insurance benefit. Silicotuberculosis is not to be regarded as tuberculosis, silicosis or their combination, but as a distinct pathological entity.

- 577 Clinical Evaluation of Disability in Pulmonary Diseases of Industry. E. Mayer. J. Am. Med. Assoc., 116, 97-100 (January 11, 1941).

The author discusses the numerous problems that arise in determining compensability for pulmonary diseases, in the light of his experience on the New York State Labor Department board of impartial consultants which reviews controversial compensation claims. Two types of problems present themselves: in one the disease is related to a definite industrial hazard, but it must be decided whether it is disabling; in the other, disability is recognized, but the question is whether the occupation is responsible. The author attacks these problems under the following headings: (1) etiology; (2) production of lung injury and its anatomic results; (3) recognition of pulmonary illnesses, and (4) how such illnesses produce pulmonary incapacity, particularly with respect to reliable clinical and laboratory procedures for determining such disability. Two illustrative cases are described. Three types of pulmonary function tests are cited and discussed in detail: (1) ventilation, or ability of the lung to inflate and deflate; (2) gas exchange tests which measure the oxygen debt, the oxygen deficit, and the oxygen unsaturation of the arterial blood hemoglobin; and (4) measurement of efficiency of the pulmonary circulation. In conclusion, the author submits a classification of disability grading: (1) phase of compensation, in which pulmonary fibrosis and emphysema are present to a considerable degree, but the emphysema is still compensatory and does not restrict capacity for moderate exercise; (2) latent decompensation, in which fibrosis and emphysema are extensive, with marked restriction of exercise capacity with dyspnea occurring regularly on moderate exercise; and (3) manifest decompensation, where the fibrosis and emphysema are associated with more or less dyspnea even while the patient is at rest.

- 578 Possible Respiratory Irritant from Cotton Dust or Cotton Dyes. Queries and Minor Notes. J. Am. Med. Assoc., 116, 2449 (May 24, 1941).
The question is what irritating substance or dye may be present in khaki-colored cotton now being made for the government, as persons who handle this material suffer irritation of the nose and throat. The reply indicates the cotton dust itself, especially if it contains histamine, as the most probable cause. In England, byssinosis, a lung disease from cotton dust, is compensable. Irritation from any dye is most commonly manifest as dermatitis. The absence of dermatitis tends to exclude, but does not necessarily exclude, dyes as the source of respiratory infection. Sulfur brown dye and chromate dusts may be considered as possibilities, and allergens may theoretically exist in catechu. Several references on the effect of cotton dust are given.
- 579 Arbitration of Medical Bills. E.D. Sayer. Ind. Med., 10, 13-4 (January 1941).
The author traces the development of the present New York State procedure for arbitration of medical bills for occupational illness and injuries, and describes the method of operation of the law. He is convinced that the procedure for arbitration and settlement of medical bills now in effect, while not perfect, is the best system yet devised for the handling of the great and troublesome problem. It remains with the doctors themselves to keep it working satisfactorily.
- 580 A Survey of Non-Occupational Illnesses and Injuries in a Major Oil Refinery. N.E. Forster and Hazel H. Leeds. Ind. Med., 10, 1-5 (January, 1941).
Statistics are presented covering the extent of occupational and non-occupational illnesses and injuries in a large oil refinery during 1939, with special attention to respiratory diseases. The latter are responsible for 61.5% of lost time cases, and exceeded by only a small margin all other non-occupational diseases and non-occupational injuries combined. The highest incidence was in February, and prophylactic measures and control of working conditions at that period should be instituted with an attempt to reduce the incidence. Gastrointestinal disorders and the arthritic-neuritic group are next in frequency, and can be controlled by more rigid pre-employment examinations and periodical check-ups. Regarding injuries, four times as many lost time cases were injured outside the plant as in occupational pursuits, and the days lost were nearly double. Reduction of non-occupational lost time illnesses and injuries can be achieved by more attention to the subject on the part of employers, especially by the visiting nurse. Routine checks by the nurse will also decrease the number of cases in which the family doctor certifies to an unduly prolonged disability. The average time lost by the worker has been reduced from 28 days to under 8 days a year in a relatively short time, through the efforts of industry, but present necessity for defense measures and the interest of the government in worker's health should stimulate industry to efforts to improve the worker's health still more.
- 581 Rehabilitation at Baton Rouge Refinery. J.L. George and G.M. Allen, Jr., Ind. Med., 10, 83-7 (March, 1941).
The authors describe the rehabilitation program at the Baton Rouge refinery of Standard Oil Company of Louisiana. The same problems were encountered, and met in the same general way, as have been reported by others, but a few additional points are noteworthy. In the case of the white employee the causes of disability from illness follow very much in the order of causes of death in the nation, namely heart disease, tuberculosis, etc. Among colored employees, syphilis is the chief cause of disability. White employees predominate in the group that require consideration due to industrial accidents, while the colored employees predominate in the group requiring consideration due to illness not attributable to their jobs. Disabled employees frequently make the best employees. A definite medical plan, thorough examination prior to placing employees in a remunerative occupation, and a perpetual inventory of disabled personnel are advocated.

582 Chronic Arthritis and Re-Employment. J.G. Kuhns. Ind. Med., 10, 94-9 (March, 1941).

To the layman, chronic arthritis is most commonly associated with crippling of the spine or extremities and with serious disability. Rarely is it considered compatible with a fair measure of health and relative freedom of physical activity. So prevalent is this concept that it is very difficult for individuals to find employment. On the other hand, using the records of the Robert Breck Brigham Hospital as a yardstick, it would appear that only about one-fourth of chronic arthritics do not become re-employable in some capacity due solely to the severity of their arthritic condition. Contributing factors to the question of the probability of their re-employment include such considerations as occupational class and type of arthritis. Much more detailed and carefully collected data over a longer period of time are necessary for the successful elucidation of the long neglected problem of re-employment and chronic arthritis.

583 Medical Evaluation of Nutritional Status. IV. The Ocular Manifestations of Avitaminosis A, With Especial Consideration of the Detection of Early Changes by Biomicroscopy. H.D. Kase. Pub. Health Repts., 56, 1301-21 (June 27, 1941). Of 143 persons in a low income group, 45% had gross and another 54% had microscopic ocular lesions characteristic of avitaminosis A. The ocular condition was xerosis conjunctival. Following administration of vitamin A as specific therapy to a part of the group, the conjunctival lesions in nine persons have now completely disappeared, as judged in all instances by biomicroscopic examination. In all others receiving therapy, the conjunctival lesions have markedly receded to the point of near disappearance. In all cases the striking feature is the very long period of time required for complete recovery, a matter of months even with therapy of high potency. Those persons not receiving therapy have shown no improvement. It is suggested that xerosis probably precedes night blindness as an early sign of avitaminosis A. For detection of early avitaminosis A, the biomicroscopic examination is recommended as a simple, convenient, objective method. When it is combined with gross examination, all degrees of xerosis may be graded according to severity and extent. The marked prevalence of avitaminosis A in this low-income group, objectifying and validating previous dietary data, suggests its relatively frequent occurrence in the population at large.

584 Economical Dust Control with Low Resistance Exhaust Systems. Part 4. Filter Connection and Fan Selection. F.F. Kravath. Meat. & Meat., 38, 33-5 (February, 1941).

In this installment the importance of proper connections for the filter and exhaust fan are discussed. When properly connected, the resistance loss across the filter is a large fraction of the overall resistance loss, but the overall loss may easily become several times the filter loss when the assembly is poorly designed. The size of the filter must be selected not only for performance but also for low resistance characteristics. It is false economy to scrimp on the size of the filter, as savings in first cost will be replaced by increased maintenance costs and power consumption. Size is an important consideration in fan selection also. For a series of similar fans, capacity is directly proportional to the square of the diameter of the fan wheel, and so a small fan must be operated faster than a large one. Other items discussed are frictional loss in the bearings, leakage, frictional resistance of the air moving over the fan parts, and shock losses. It is essential in order to secure the most efficient fan that we carefully select the proper size, the most efficient type and the best workmanship.

Legal Developments

698 Inhalation of Vaporized Lead Paint. Lead Poisoning, Accidental Injury.
Respondent worked half a day with petitioner on July 28, 1940, and experienced some discomfort and requested a respirator which the petitioner furnished but which by reason of its age and condition, was only partially effective. Respondent worked the following day and skipped a day on account of lack of paint and then worked three days more with lead paint and two days with aluminum paint which had no lead content. The respondent testified that he began to have stomach cramps and muscular pains on the third day but that he thought that his difficulty was due to the confined space in which he was working and the intense heat. Respondent returned to his home July 31st and his condition became such as to require medical attention. An injury to an employee engaged in a hazardous employment by consequence of exposure to and inhalation of vaporized lead paint discharged by pressure spray gun over a short period of time which results in acute lead poisoning is sufficiently certain and definite in point of time to constitute an accidental injury. Award of compensation for temporary disability sustained. C.E. Howard & Co. et al. v. McKay et al. Okla. Supreme Ct. Decided September 9, 1941. (CCH).

699 Eye Burn Resulting From Exposure to Arc-Light Flashes. "Accident" Within the Meaning of the Act. Time of Occurrence of the Accident.
This controversy involves a claim for compensation for an eye burn, "conjunctivitis," resulting from exposure to arc-light flashes while the employee was working near some welders. The Industrial Commission found in favor of the claimant and awarded compensation. No permanent disability is involved, the matters presented being the happening of an accident, and the question as to which of two insurance carriers is liable should it be judicially determined that the employee sustained a compensable accidental injury within the meaning of the Workmen's Compensation Act. It is undisputed that the Great American Indemnity Company, plaintiff in error, was the insurer of the employer for this hazard until noon May 12, 1940. The company denies liability after this date, and asserts that the State Compensation Insurance Fund became the carrier of the risk. The Industrial Commission found that the accident occurred May 10, 1940. The points urged as requiring reversal are that there was no accident within the meaning of the Workmen's Compensation Act; if there was an accident the disability did not extend over ten days; the accident occurred some time after noon May 11, 1940, at which time plaintiff in error was not the carrier of the risk.

Counsel for the indemnity company first contend for nonliability, in that claimant suffered from an occupational disease rather than an accident. If claimant had been working as a welder there perhaps would be some basis for the contention advanced. He was engaged in doing general work, nor was this injury, under the circumstances, to be expected in the usual course of events. There is ample testimony to support the finding that the disability was compensable from June 5 to July 5, 1940. There is no dispute that the injury for which the employees sought compensation was present May 10. The commission was warranted, as a reasonable inference therefrom, in finding that claimant's eye condition resulted from an exposure to flashes incident to welding operations on that date, or within a reasonable time prior thereto. The judgment is affirmed. Great American Indemnity Co. v. State Compensation Insurance Fund et al. Colo. Supreme Ct. Decided September 2, 1941. (CCH).

702 Silicosis. Recovery of Common-Law Liability for Negligence. Attempt to Recover from Insurance Carrier. No Accident.

It appears that the plaintiff, before the institution of the suit at bar, had secured a judgment against his former employer, the National Iron Company, for damages on account of having contracted silicosis by reason of the negligence of the employer in its failure to obey and comply with certain statutes of the State of Minnesota designed for the safety and well-being of employees in certain types of industry. The plaintiff alleges his inability to collect his said judgment from his former employer, and brings this suit against the insurer. The defendant, on the other hand, contends that said policies only cover liability for injuries sustained by accident, and that plaintiff's condition was caused by disease. There are raised by the pleadings but two questions for the Court to determine on this motion: first, whether the policies cover liability for all injuries or only those sustained by accident, and, second, was plaintiff's injury sustained by accident. In the case of *Golden v. Lerch Bros. Inc.*, the facts are almost identical with those of this case. The Court in the *Golden* case said: "The recovery of *Golden* against his employer was not under the compensation law. It was exclusively on their common-law liability for negligence, that they functioned harmfully, not through or because of accident, but rather and exclusively by insidious and chronic disease, in the causation of which there was no accident." The Minnesota Supreme Court has determined the precise questions raised here, contrary to the contentions of the plaintiff.

The motion of the defendant is granted. *Shuman v. Liberty Mutual Ins. Co.* U. S. Dist. Ct., Dist. of Minn. Decided August 25, 1941. (CCH).

703 Occupational Diseases. Workmen's Compensation Law Supplement, New York State Department of Labor, p. 14, 1940.

Carbon Monoxide Poisoning. A mechanic who tested a large number of automobile motors each day in an ill-ventilated room became blind as a result of optic neuritis. The Industrial Board found that the blindness resulted from exposure to toxic amounts of CO from running motors and that the claimant's condition was an occupational disease covered by this paragraph. The finding was affirmed.

"Any and All Occupational Diseases." The following diseases were held compensable under this paragraph: Arthritis, traumatic, of the wrist, suffered by a presser who used a 12 lb. iron, traumatization being caused by the repeated pressure involved. Award was based on the proportionate loss of the use of the hand. Bronchial asthma, suffered by an automobile spray painter.

Bronchitis complicated with asthma contracted by a tunnel worker. Bell's palsy suffered by the driver of an open truck and attributed to exposure to drafts, cold and wind, necessitated by his employment. Dupuytren's contraction sustained by a marble polisher required to tighten and loosen clamps.

704 Slight Deviation from Duty. Annotations, p. 29, Workmen's Compensation Law, South Dakota, 1941.

Not every slight deviation from an employe's duty will deprive him or his dependents of their right to compensation under the Workmen's Compensation Law. There is a distinction between negligently doing an authorized act and doing an unauthorized act or one beyond the employe's job. The first does not deprive the employe of his right to compensation whereas the latter does. If the injury or risk of injury is incidental to employment, the right to compensation follows. (*Stratton v. Interstate Fruit Co.*, 47 S. D. 452, 199 N.W. 117).

- 705 Disease: "Injury by Accident." Annotations. p. 26, Workmen's Compensation Law, South Dakota, 1941.

Encephalitis, causing sudden collapse of a district manager after unusual exertion, exposure and exhaustion, was held to constitute "injury by accident." (*Hanzlik v. Interstate Power Co.* 67 S.D. 289 N.W. 589).

NOTE: It has been called to our attention by one of our member companies that in item #427, June, 1941 issue of the Digest, relating to the recent enactment in the State of Washington of Chapter 235, 1941, the wording is so framed as to be apt to give the erroneous impression that such act did not repeal the schedule of occupational diseases previously contained in the law (Sec. 7679-1 of Remington's Revised Statutes) and consequently that such schedule is still part of the law whereas such act of 1941 expressly amended said Sec. 7679-1 of Remington's Revised Statutes to read as expressly quoted in the first paragraph of item #427 in the Digest, with the understanding, according to all rules of construction, that the said schedule is no longer law. Compensation is now payable in Washington for any "such disease or infection as arises naturally and proximately out of extra-hazardous employment" this term being elsewhere defined in the statute.

Vapors on Dust, Gases and General Industrial Hygiene

- 706 Prevention of Silicosis. Joetten. *Arbeitsblatt*, 22, 575-578, 579, (November, 1940). Discussion of the use of metallic aluminum in the prevention of silicosis. Excerpts are given from the report in the *Arbeitsblatt* (vol. 20, No. 26, 1940). An extensive bibliography is given.

- 707 Mineralogical Examination of the Silicosis Question. H.J. Holmers and H. Udluft. *Jahrbuch d. Preuss. Geol. Landesanstalt, Berlin*, 59, 727-754, (1939). (German). Sericite, kaolin and feldspar were the most important substances found in the lung of a silicotic miner. There was no quartz. However, the wash liquor contained an important quantity of colloidal silicic acid. The authors think that the pH is most important in dissolving the silica in the tissues and so, correspondingly, it plays an important part in determining the course of the disease. The dissolved substances correspond to the physico-chemical reaction of the dust particles and the fluids of the body, either eliminated without harm or producing callosities by precipitating out from silicic acid.

- 708 Structural Examination by Roentgen Rays of Pneumocystic Lungs of Porcelain Workers. Part 4. H. Gartner. *Arch. f. Gewerbepath.*, 10, 151-163 (1940). (German).

Roentgen and chemical findings are presented of the dust seen in the lungs of 10 porcelain workers and 1 fluorite worker. Kaolin and quartz lines were seen, and in every case in which dust was found, quartz was also shown by chemical analysis. The author states "...in the diagram, interference rings of kaolin were to be found preponderantly or even alone," and further that "therefore it is obvious to say that the sillimanite and kaolin may give silicosis without essential admixture of quartz."

- 709 The Question of Serial Examinations of Workers Exposed to Dust, by Means of Miniature Roentgenograms. E. Saupe. *Arch. f. Gewerbepath.*, 10, 93-96 (1940). (German).

It is possible to examine many men in a short time with miniature film -- the size most frequently used is 24 sq.mm. (0.95 sq.in.). Second stage silicosis is easily seen with certainty and first stage can usually be recognized if the technic is perfect. The method must be improved and should be followed by large films in suspicious cases.

- 710 Silicium, Silicates, Silicosis. W. Glass. Klin. Wchnschr. 19, 558-560 (1940). (German).

Rabbits were injected intravenously with finely ground silicate dusts: clay, feldspar, sericite. Deposits of the dust were found in the spleen, liver and lymph glands but no increase in fibrous tissue. Opal (amorphous silicic acid) was also injected and the results were large deposits of dust with many giant cells, but no fibrous tissue. Opal is more soluble than quartz; therefore, the conclusion is made that the dissolved silicic acid is not the fibrous-producing substance alone. Quartz is the only substance producing silicosis. Dust taken from markedly silicotic lungs was also injected, and this again produced silicosis. A decrease in the amount of the injected dust could not be found. The author was able to show the formation of a covering, characteristic of asbestos bodies, by feldspar, sericite and also opal, but in the smallest particles only, in the cellulose. He concludes that dissolved silicic acid but not the quartz may produce this covering. Quartz shows no morphologically demonstrable appearance of dissolution; in the tissue the dust deposited in calcifications retains its fibrous producing effect.

- 711 Pulmonary Cancer Produced by Asbestos Dust in Experimental Animals. M. Nordmann and O. Sarge. Zeitschr. f. Krebsforsch., 51, 149-152 (1941). (German).

Experimental work with mice inhaling asbestos dust over a period of from 47 to 90 days for 3-1/2 to 5 hours a day produced asbestos bodies and pronounced degrees of diffuse fibrosis after the 30th week. Proliferation of the bronchial epithelium was found, such as hyperplasia and encroaching on neighboring alveoli. This was followed by a metaplasia to papillary epithelium with cornification, which later seemed to be a transitional malignant neoplasm. The first well-developed carcinoma was found after 90 days. By this time only 10 of the mice had survived and 2 carcinomas were found among them. In the first series, 33 of 50 mice lived longer than 6 weeks; 14 showed abnormal growth of the epithelium, 5 metaplasia and cancer. In the second series, 28 (of 50) lived more than 6 weeks; 16 showed abnormal growth, 5 metaplasia and cornifying cancer.

- 712 A Case of Pulmonary Asbestosis Accompanied by Tuberculosis. H. Harnesson. Tubercle, 22, 40-44 (February, 1941).

During the period 1933-1939 inclusive, there were 90 known deaths from asbestosis in Great Britain, of which 32 were associated with tuberculosis. This reports the case of 44 year old man who had been an asbestos blower, supplying the material to a cleaning machine. Although supplied with a respirator, he had never worn it. He was thin, had a high temperature, emphysema, and bilateral crepitations over wide areas. Clubbing of the fingers was marked and the sputum contained both asbestos bodies and tubercle bacilli. The roentgenogram showed "widespread progressive nodular tuberculous infiltration with cavitation in all zones of the right lung fields and in the upper and mid-zones of the left lung fields.... The right dome of the diaphragm was elevated. There was no radiographic evidence of pneumoconiosis." A diagnosis of asbestosis and tuberculosis was made. The patient died within a month of spontaneous pneumothorax. Pulmonary findings showed both to have extensive fibre-caseous tuberculosis with cavitation; macroscopically they were like those of pure tuberculosis. Microscopically there was revealed caseous tuberculosis with many tubercle bacilli and typical reticular fibrosis of asbestosis with thickened pleura. There is a discussion of the diagnosis of the pure and complicated disease.

713 The Lungs of Coal Miners in New South Wales, Chemical Analysis and Pathology.

C. Badham and H.B. Taylor. Studies in Ind. Hyg., No. 20. Report for year ended December 31st, 1939. Health Dept., New South Wales.

A report of findings in a study of the lungs of 30 miners and other workers in the mines of New South Wales. A brief case report is given for each individual, including occupational history, gross and microscopic pathology in the lung, cardiovascular and other complications, and chemical analysis of the lung. The findings are tabulated but analysis of the data is postponed for a later monograph. The authors state their views as to the formation of coal dust nodules, which they regard as "taking origin at the same site as the early silicotic nodule, but owing to their more diffuse nature, they early surround and include the terminations of respiratory bronchioles." They raise the question as to how far this reaction is due to the inert dust and how far to the small amount of free silica which accompanies it. They also believe "that very little of the dust breathed finds its way into the interstitial tissue of the lungs, and that very little of the relatively insoluble dust is eliminated by excretion or by the lymphatics."

714 "Miners' Lung" Pneumoconiosis, Silicosis, Anthracosis: An Analysis of 227 Cases.

C.C. Gifford. Military Surgeon, 68, 264-282 (1941).

Cases of pneumoconiosis have been collected from the records and x-rays of a large Veterans' hospital for tuberculosis. Of the total 227 cases, 142 are considered as 1st, 2nd and 3rd stage pneumoconiosis, 54 as 1st, 2nd and 3rd stage pneumoconiosis with tuberculosis and a small group of 31 cases on which autopsy was performed. These seven categories are divided according to age group and to years spent in mining. In all cases of simple pneumoconiosis, sputum samples were consistently negative. X-rays of one patient with 3rd stage pneumoconiosis were taken over a period of 3 years with no progression visible on the plate, although the symptoms increased in severity. A large number of the men had had comparatively short exposures, although one was as long as 48 years. Of the 31 autopsies, 21 showed no tuberculosis and the cause of death in most or all of these was a disease other than pneumoconiosis. Three cases diagnosed as pneumoconiosis showed no silicosis at autopsy. There is a discussion of diagnosis.

715 Study of Dust Conditions in the Tri-State Mining District of Oklahoma, Kansas and Missouri. C.C. Dills. Am. J. Pub. Health, 31, pp. 619-629 (June, 1941).

A study of surface and underground dust conditions in the Tri-State District has been in progress for 8 months. 1366 surface dust samples were taken at 11 stations. The worst average dust concentration in the area was found to be 3.3 million particles, and the average for all counts was 1.1 million per cu. ft. Control stations outside the field gave an average count of 0.35 million particles. Medical studies are still being conducted so that safe limits can be set.

Dust conditions in mines that had a routine sampling service were found to be better than in mines without this service. The average dust count for drillers in the latter was 6.6 million particles, compared with 1.6 million for the former mines. The average dust counts for shovelers were 4.3 and 2.7 for mines without and with sampling services. Collaring holes dry was found to be the worst source of dust. Dust control measures include wetting muck piles, working faces and haulage ways, spraying headings and drifts and mechanical loaders, shooting off shift, collaring holes wet, and ventilation. Dust sampling in confined places has indicated that where these dust control devices are applied properly, dust concentrations can be maintained below 5 million particles.

Discussion: Similar results were found in 10 mines in Oklahoma. Lower counts were seen in mines with routine dust sampling than in mines without. Double shift operations increase the dust problem by keeping the dust from settling.

716 Control of Tuberculosis and the Employment of a Tuberculous Individual in Industry. W. A. Sawyer. Ind. Med., 10, 221-226 (June, 1941).

1. Industrial medicine is primarily directed toward the discovery of incipient disease.
2. An example of this is the detection and control of tuberculosis amongst the employees of the Eastman Kodak Company where the incidence has been reduced since 1921 from 2.3 per 1,000 to 0.2 per 1,000 in 1940.
3. A program of routine serial or annual stereorontgenograms was made an established procedure in 1928.
4. An accurate and active follow-up technic is a basic requirement for the success of any effort to curb tuberculosis.
5. In a study of the cost of tuberculosis among 100 of these employees, average age 31 years, the average time lost from work per case was 595 working days or 2 years and 15 weeks. The total cost for these 100 cases was \$406,162 or an average per case of \$4,061.62. Private agencies bore approximately 80% of the cost, while public agencies (city-supported) bore approximately 20%.
6. Rehabilitation of the worker after convalescence must be considered if the gains of treatment are to be maintained.
7. A survey of 215 industrial organizations by E. A. Northausser revealed the fact that 303 employers re-employed workers with arrested tuberculosis.
8. The following factors must be taken into account in any consideration of the employment of an arrested case of tuberculosis:
 - (a) The extent of the lesion;
 - (b) The completeness of the cure;
 - (c) The character of the job;
 - (d) The necessity for adequate medical supervision after return to work.
9. It would seem safe to say that the employing of an arrested case of minimal tuberculosis on the proper job is not too great a risk, provided such individuals are under adequate medical supervision.
10. Discovering and arresting tuberculosis is only successful if we make it possible for the individual to once again become a wage earner.

717 Infection by Tuberculosis in Working Places. Obligation of the Manager to Prevent the Danger of Infection of Workers. Zischr. f. Arbzt. Fortbild., 37, 707-708 (1940). (German).

The courts recognize the claim for compensation in cases where one worker contracts tuberculosis from another worker in the factory. The supreme court stressed that the plaintiff need not prove the facts very strictly if there is a question of the managers having violated his duty of protecting the workmen's health. It is sufficient to prove that there were irregular and dangerous conditions.

718 Report of a Study of the Granite, Mica, Feldspar and Foundry Industries in New Hampshire. F.J. Vintinner and others. N.H. State Board of Health, Concord, N.H. pp. 72 (February, 1941).

More of a treatise on general subject of dust control than a statement of the findings in a detailed study. Illustrates the difficulty of presenting a representative picture of working conditions in an industry, when conditions vary considerably from plant to plant.

719 Expert Opinion About Pneumoconiosis (Silicosis). E. Gaubatz. Beitr. z. Klin. d. Tuberc., 95, 286-311 (1940). (German).

Only "serious" silicosis is compensated in Germany. New connective tissue formation in the lungs must diminish respiratory capacity and affect the circulation so that there is a considerable decrease in bodily efficiency. The author has examined respiratory and cardiovascular function in 300 silicotics in the past five years. Thirteen cases and their conclusions are referred to in detail.

720 Silicosis and Silico-Tuberculosis. II. Critical Examination of Roentgenograms. Differential Diagnosis Between Silicosis and Other Pulmonary Diseases.

E. Gaubatz. Dtsch. Tuberk.-Bl., 15, 32-40 (1941). (German).

A presentation of good description and reproductions of x-ray films of silicosis at different stages. Discussions of differential diagnosis are given, illustrating the differences in films of silicosis, tuberculosis, miliary tuberculosis, cardiac lung, and carcinoma.

721 Subcutaneous Injections of Oxygen in Therapy of Lesions of Respiratory Organs Caused by Irritating Gases. I.Y. Semovits. Sovetsk. Med. No. 19 p. 22. (1940). (Russian).

A report of 51 cases of toxic bronchitis, bronchiolitis and broncho pneumonia caused by irritant gases and treated with subcutaneous injections of oxygen. Among the irritants were hydrofluoric acid, phosgene, chlorine and chlorpicrin. Subcutaneous oxygen was introduced in amounts varying from the initial dose of 200 cc. to 1000 cc. every other day; in cases of pneumonia and broncho pneumonia 1000 cc. was injected daily. There was an immediate improvement subjectively, followed by cessation of cough, the sensation of tightness in the chest, dyspnea and the amount of sputum. It is also of value as a supplementary measure in the treatment of acute and subacute bronchitis caused by irritating gases.

722 Disabling Sickness Among 2,000 White Male Glass Workers. W.M. Cafifer. Public Health Reports, 56, 1791-1799 (September, 1941).

This report deals with sickness and non-industrial injuries causing disability lasting 8 calendar days or longer among approximately 2,000 white male workers in the glass industry during the years, 1930-34. The frequency of disability by broad diagnosis groups compares favorably with that experienced by 170,000 male industrial workers. The number of days of disability because of rheumatic diseases was over 50% greater than the number accounted for by influenza and grippe. Grinders, outside workers, and finishers experienced frequency, disability, and severity rates well above the average for the entire groups of workers. It is of interest to observe that the outside workers show all three indexes to be relatively high for either the respiratory or the non-respiratory diseases. Finishers, on the other hand, show indexes below the average for the entire group of workers with respect to respiratory diseases but above the average for the non-respiratory diseases. Grinders' disability indexes above the average with respect to non-respiratory diseases, and while this occupational group experienced a low frequency of respiratory diseases the disability and severity rates were above the average for the entire group of workers. Batch mixers, furnace and casting workers; show a relatively low frequency of respiratory diseases but a long average duration of cases.

723 Catching the Dust from a Hammer Mill. O.C. Ralston and J.E. Conley. U.S. Bureau of Mines, Report of Investigations 3538 (1941).

A dust catcher designed for use with a hammer mill is described and illustrated. This type of mill probably exceeds all other types of crushers in the quantity of dust released into the surrounding air. This arises from the fact that the action of a hammer mill is closely analogous to that of a fan or blower. This emission of dust around a hammer mill is checked by means of a bag enclosed within a closed supporting frame that is provided with a flap door to permit the placing of a container to catch the crushed material. A pipe directs the air current from the top of the frame to a large can that contains the bag. This bag, in turn, rests in a wire net. The wire net is enough smaller than the can so that a 2-in. annular ring remains around the net. This detail prevents the suction of the blower from sealing the bag against the wall of the can. About 99 per cent of the dust is caught by this bag, and another bag - on the blower - finishes the job.

- 724 Public Opinion Demands Removal of Dust from Cement Plants. Anonymous. Concrete (Cement Mill Ed.) 49, 214-216 (August, 1941).
A discussion of the various modern types of dust control equipment available for cement mill installation. According to the author, a "well-known cement plant superintendent," "The public demands the discontinuance of dusty conditions within a cement plant, and in the atmosphere around a cement plant if it happens to be located in or near a city or town, or in a rich farming community." He has seen this public attitude developing and growing all through his 25 years of experience in cement manufacturing operations.
- 725 Ignorance is no Excuse. L.R. Bloomenthal. Heating, Piping and Air Cond., 13, 564-566 (September, 1941).
With prolonged hours of operation and a constant influx of new workers, due to the demands of the defense program and the general rise in business activity, industrial health hazards are likely to increase, particularly in those plants where gases, dusts and fumes result from manufacturing processes. The author, an attorney, gives a number of specific cases which have come up in various states in this brief review of the subject. His selection of the material brings out a number of the legal principles involved.
- 726 Resolutions of the German Commission on Protective Devices Against Dust. Arbeitsschutz. p. 407 (1941). (German).
Protective devices were tested by the committee for the dust protection of the insurance associations. The results of the devices, together with descriptions and illustrations, are given.
- 727 Röntgen Findings of the Lung in Aspergillus Fungoides. J. Werth. Arch. f. Derm. u. Syph., 131, 299-314 (1940). (German).
The appearance of the lungs in these cases was like silicotic lungs with "more fibrosis than usual" and "coarsely mottled." The disease begins in the lungs with a characteristic enlargement of the bronchi, spreading out along the vessels to give a picture of increased fibrosis.
- 728 Hydrogen Phosphide Poisoning. I. Animal Experiments on Acute and Subacute Poisoning. W. Müller. Arch. exptl. Path. Pharmacol., 195, 184-193 (1940). (German).
In atmospheres containing 1:400,000 or more of hydrogen phosphide rabbits were injured or killed by prolonged exposure. The intoxication is cumulative and the prognosis is unfavorable. All important organs are congested. The worst damage is suffered by the respiratory tract, liver and kidneys.
- 729 Occupational Dangers from Hydrogen Sulfide. G. Rodenacker. Med. Klin., 37, 215-217 (1941). (German).
A discussion of the different health hazards of hydrogen sulfide -- acute poisoning, conjunctivitis, etc. There are reports of interesting cases, the historical background of this industrial disease, and a discussion of therapy.
- 730 Order of the (German) Minister of Labor Regarding the Protection of Spray Painters, March 6, 1940. Reichsgesundheitsbl., 15, 383-384 (1940).
The terms of reference of the insurance association for fine mechanical and electric technics for producing fresh air apparatus for spray painting are published. Spraying large pieces and standing inside the spray booth, the painter can be protected only by supplied-air apparatus. This must fulfil the following requirements, among others: Compressed air supplied to the workers from the main factory source must be cleaned of oil vapors by activated charcoal filters; the compressed air must be delivered in a single line to the worker's bench and here it must be separated into spraying and breathing tubes. A half-mask or cap may be used but the stream of air must not go directly to the workers' face. Automatic regulation and heating of the air are not always necessary.

- 731 Toxicology of Explosion Gases. Baum. Z. ges. Schiess- u. Sprengstoffw., 35, 181-182 (1940). (German).

Explosion gases can be divided into 3 groups with respect to their toxicological action: (1) very poisonous: CO, nitrous gases, cyanogen compounds, H_2S ; (2) fairly poisonous: nitriles, CO_2 ; (3) non-poisonous: Hydrocarbons, N, H_2O . The amounts of CO found in the explosion gases from several explosives are: picric acid 61.05, TNT 57.01, nitrocellulose powder 46.87, carbonite 36.0, explosive gelatin 34.0 and ammonal 23.74%. Toxicological action is described for CO, nitrous gases and HCN. The physiological action of explosion gases cannot be calculated from the toxicity of their components since these are not additive but synergistic.

- 732 Relation Between Carbon Monoxide Concentration in Air and Carbon Monoxide Hemoglobin Content. J. Mass. Zsch. f. Gewerbehyg., 10, 97-105 (1940). (German). Three charts are shown, depicting the formation of CO-hemoglobin in man over various periods of time if the inhaled CO concentration is between 0.01% and 1%, and if the person is sitting, walking, or working; the second one illustrates the CO-hemoglobin curves in man (sitting, walking, working) for CO concentrations from 0.01-0.07%; the third chart shows the decrease of CO-hemoglobin when the person inhaled pure air (these are based upon the author's self experiments). If the time during which an individual was working in CO air, the time elapsed between his removal and the taking of the blood sample, and the CO-hemoglobin of the sample are all known, the approximate concentration to which he was exposed can be estimated.

- 733 Photocolorimetric Determination of Fluorine in the Air with Zirconium-Alizarin. M.M. Raines and S.V. Kazachkov. J. Applied Chem., (U.S.S.R.), 13, 153-156 (Russian with French summary).

Treat samples of air containing fluorine with 0.5 cc. each of Zr-alizarin indicator, 3 N H_2SO_4 , and 3 N HCl in a volumetric flask. Add water to the mark, heat to boiling under a reflux condenser and cool rapidly. After 10 min., determine fluorine with the photocolorimeter. To prepare the indicator, mix equal volumes of Zr (NO_3) (0.75 gm per 100 cc of water) and Na alizarinsulfonate (0.17 gm per 100 cc of water). If interfering substances are present, fluorine should be distilled as H_2SiF_6 from the solution after addition of the above reagents and the distillate should be treated again as above. For the determination of fluorine a standard curve should be constructed by using various amounts of fluorine solution of known concentration. By this method 0.001-0.008 mg of fluorine can be determined.

- 734 An Improved Air Sampling Device for Field Work. F.H. Van Atta and C.H. McClure. Tech. Paper No. 2, Illinois Dept. of Labor, April, 1941. A unit for sampling air for large impingers is described. It consists of a case containing pump, flowmeter, and impinger rack.

- 735 Preservation of Health in the Rubber Industry. F. Warnecke. Zbl. f. Gewerbehyg., 28, 1-19 (1941). (German).

An interesting description of the health hazards in the rubber industry and their prevention. Benzene and other solvents especially are discussed and some interesting facts about the dangers of "Buna" (artificial rubber) production are brought to light. The escaping vapors, especially of styrol, irritate the skin. Individual processes and methods of decreasing their dangers are reported, and there are a large number of illustrations.

- 746 Spirochetal Jaundice (Weils' Disease). N. Bloom and H. Walker. Virginia Med. Monthly, 68, 192-200 (April, 1941).

Seven instances of Weils' disease are presented, with autopsy findings in the five fatal cases. The authors believe there was an occupational factor in only one case that of a junk dealer who may have come in contact with rats during his work. Interstitial nephritis was the most common and by far the most important pathological change -- the authors consider it the cause of death. Many cases are probably mistaken for catarrhal jaundice. The syndrome of acute fever, with generalized aching and tenderness of the body, and jaundice should suggest Weils' disease -- the differential diagnosis being aided by the presence of muscular pains and kidney involvement.

- 747 Military Explosives. G.D. Rogers. Nat. Safety News, 44, 22-23, 77-80 (July 1941).

A discussion of the methods for controlling accident and health hazards in explosives manufacturing and ammunition loading plants. The manufacture and use of Teteryl, a booster used to insure high order detonations of bombs and shell fillers, has a real health hazard associated with it. The toxic effects of the vapors from the sublimators, filtrator, and recrystallizers, and the effects of the crystalline teteryl itself are all dangerous. Its effects are similar to those of TNT. TNE, amatol, ethan, benzol, ammonia, carbon tetrachloride and many other toxic substances are used in the explosives industry.

- 748 Reduce Noise in Steel Foundry Cleaning Room. A.H. Allen, Foundry 69, 60-61, 143 (September, 1941).

It has been estimated by the National Noise Abatement Council that daily losses in industry because of excessive noise amount to approximately \$2,000,000. The loss is measured in terms of lessened effective effort by workmen subjected to continuous loud noise. This article recounts a program to rearrange a foundry and erect an entirely new cleaning room which would take advantage of the latest ideas in the technique of foundry noise absorption. Many noise-producing operations were moved in acoustically treated booths, and the interior of the building including walls and roof, was treated completely with acoustic material. Expressions have already been received from the workmen indicating their approval of the noise reduction methods which have been instituted. Management is convinced that the expenditure will certainly be translated into more efficient and faster operations in the plant.

- 749 Dust Control System Design, Installation and Operation from the Commonsense Standpoint. F.F. Kravath. Heat. & Vent., 39, 28-31 (June, 1941).

Points to be gained from installation of an effective exhaust system, well designed and maintained, are emphasized. The advice of an expert or consultant should be employed wherever possible. There is a discussion of the importance of maintaining standards and of giving physical examinations.

- 750 Lighting and Efficiency. E. Kammerer. Zbl. f. Gewerbehyg., 25, 33-40 (1941). (German).

Increasing the intensity of illumination increases visual acuity, but beyond a certain intensity this is very slight. Intensity must correspond to the fineness of the work, but the direction from which the light enters the field of work is also important. Blinding by the light and by the reflections from the work is to be avoided. Mercury and sodium lights may be of use, since color is sometimes of importance. Examples are given of the economy of better illumination.

Digest of Industrial Hygiene - 15.

- 751 Industrial Health Defense: How Plant Engineers Can Make Field Measurements of Industrial Ventilation. W.C.L. Hameon. Heating, Piping & Air Cond., 13, 22-28 (1941).

Apparatus for making field measurements of air-flow in industrial exhaust equipment is described. Chemical smoke producers for tracing leaks or direction of air movement are discussed and illustrated as are the u-tube manometer and the pitot tube for measuring velocities. Also shown is a carrying case for these instruments.

- 752 The Prevention and Treatment of Affections Occurring in the Magnesium Industry. N. Ryper. Practitioner. 145, 92-99 (February, 1941).

Some of the occupational affections resulting in the production and processing of magnesium are discussed. Brief references are made to magnesium dust and pneumoconiosis, bismuth baths used in treating magnesium castings, sulfur dioxide, magnesium chloride and exposure to x-rays in inspection of castings. The treatment of ailments resulting from the several exposures is given in detail.

- 753 Injuries and Damage to the Ear by Explosion and Sound. A. Groifenstein. Munch. med. Wchnschr. 1345-1359 (1940) (German).

The subject of injuries to the ear by acute and chronic occupational influences is reviewed. War injuries are discussed in detail: damage from firing one shot, by the effect repeated firing in a short time, noise in flying and noise from motors and propellers.

- 754 Diagnosis of Occupational Diseases by the General Medical Practitioner. D. C. Straus. Ill. Mod. J., 79, 44-51 (March, 1941).

This is the first of a series of articles by the Director of Industrial Hygiene, Illinois Department of Labor, intended to acquaint the general practitioner with the problem of occupational diseases. Specific hazards will be dealt with later. Attention is directed to the need for getting a complete occupational history.

- 755 Industry Must Accept Obligation to Protect Eyesight of Workers. M. Davidson. Concrete Cement Mill Ed. 49, 184-185 (June, 1941).

There are two aspects to the obligation of industry to safeguard its workers' eyes. One is to make the environment safe for the worker by eliminating hazards causing accidents, and the dusts, fumes, intoxications and poor illumination, responsible for occupational diseases. Much has been accomplished in this connection. The other aspect, that of making the worker safe for himself, his co-worker and industry, has not yet received the recognition it deserves. It involves proper vocational guidance and advice for the applicant with irremediable defective eyesight and for the worker who has acquired it in the course of his employment. A survey of the incidence of true defective eyesight among the industrial population in terms of its most important element, visual acuity, indicates about 14% to 18%, with most probably less than one half serious, defectives.

- 756 New Theories Concerning the Origin of Myopia. K. Lindner. Klin. Monatsbl. f. Augenheilk. p. 582 (1939). (German).

The author presents his concept that myopia may be acquired by working at close range, in opposition to the concept of Steiger, prevailing today, that it is always inherited. The occupational implications of this proposition are obvious.

757 Aero-Otitis Media in Compressed Air Workers. Treatment with Helium-Oxygen Mixtures. W.H. Requarth. J.A.M.A. 116, 1766-1769 (April 19, 1941).

This condition was originally described in aviators but is found quite often in compressed air workers as well. Obstruction of the Eustachian tube is the primary cause and is most often due to upper respiratory infections. Pathologically, there is deformity and hyperemia of the tympanic membrane, and serous or sanguineous exudate in the middle ear. Clinically there is tinnitus, earache and impairment of hearing. Perforation of the drum with subsequent suppuration is the most frequent complication, with occasional permanent impairment of hearing. Pre-employment estimates are useful in eliminating those who are predisposed to upper respiratory infections, in correcting defects that may contribute to repeated infections and not allowing an individual to work while suffering from a respiratory infection. Treatment with helium is outlined.

758 Health Conditions in the Glass Industry. Pluhar. Arbeitsschutz, 12-13 (1941). Several months ago a paper appeared on the health hazards of glass workers. The author, an employee of the insurance association of the glass industry, now publishes data from the association's material. He charts curves on the frequency of lead poisoning, CO poisoning and cataract on the reported and compensated cases. As only such cases are compensated which cause death or a disability for more than 13 weeks, it is to be understood that the figures are small, especially concerning compensated CO and CO poisoning cases. From 1926-1939, 408 cases of cataract had been compensated, but the compensation law has been retroactive for several years. 95% of these cases arose in hollow ware and bottle manufacture, a fact that is generally understood since it is also true that cataract is found only in certain districts because of the particular type of operation, so that exposure of the eyes to radiation is different in different districts. It is unfortunate that the author does not present figures on silicosis which is the most important occupational disease; he remarks only that 60% of the cases developed in making pots and tubs, as a result of inhaling clay dust which contains up to 50% free silica. There are other less common diseases upon which the author touches briefly.

759 Xerophthalmy of the Cornea among Glass Blowers. S.M. Kipariyev. Vestnik Oftal., 17, 150-160 (1940). (Russian).

The routine examination of 600 glass workers showed that 14.6% of them had ocular disturbances. Of these, 1.3% had cataract, but the relation between their work and the lenticular opacities were not definite, because these workers were all over 40 years of age. Conjunctival hyperemia, found in 11.6% of the workers, cleared up 2 or 3 hours after work. One man who worked before an open fire without glasses had blepharospasm. The deleterious effect of light and heat in this industry is indicated by 8 cases of corneal xerosis. Two cases of optic neuritis could be attributed to the effect of ultra violet rays. The author urges that workers have their eyes examined before entering the industry, and that the administrative department be charged with the responsibility of providing and enforcing all prophylactic measures.

Papers on Industrial Poisons, Cancer, Dermatitis, etc.

760 Focal Infection and Occupational Eczema. F. Koch. Arch.f.Dermat. u. Syph., 180, 47-50 (1940). (German).

Focal infection is frequent both in persons with occupational eczema and in healthy persons -- no etiological relationship could be established. The success of the therapy was the same in eczematous patients with and without focal infections; the removal of the foci was without effect on the eczema.

- 761 Clinical Aspects and Treatment of Occupational Diseases of the Skin. G. Hopf. *Zeitschr. f. artz. Fortbild.*, 38, 33-38 (1941). (German).

The importance of the occupational factor may be doubted and individual aspects considered if a skin disease continues more than six months after ceasing work. Negative skin tests are not always proof that there is no causal relationship between the disease and the occupation. Positive tests are important but not necessarily a proof. In diagnosis and prevention, inspection of work, workroom and worker are important.

- 762 Pathogenesis of Hypersensitivity to Flour and Persulfate in Flour Workers. H.A.E. van Dishoeck and D.J. Boek. *Arch f. Dermatol. u. Syph.*, 181, 34-40 (1940). (German).

A discussion of the significance of flour and persulfate allergy and their importance in the origin of bakers' and millers' diseases. Nearly every baker and miller with chronic bronchitis, asthma and eczema show a positive reaction to flour. Epithelial persulfate allergy is positive only in bakers suffering with florid eczema in a portion of the cases. But German authors found positive persulfate reactions in 75-80% of the eczematous bakers. The authors stress the point that flour allergy is acquired by inhalation. The skin irritation from wet flour, water, etc. promotes the development of persulfate allergy.

- 763 Value of Skin Tests in Recognizing and Preventing Occupational Dermatoses. F. Koch. *Wien. med. Wochschr.*, 91, 6-11 (1941). (German).

Skin diseases which are apparently occupational in etiology may be shown to be caused by substances not used in the patient's work. Early recognition of the cause is also useful in preventing a sensitivity from becoming polyvalent. It is imperative to make the skin test with the actual substance used in the plant, not with a substance of the same name. Variability in the results of tests and the dermatoses caused by friction (eczema of hands) must be kept in mind.

- 764 A New Industrial Skin Cleanser. L. Schwartz. *Pub. Health Repts.*, 56, 1788-1790 (September 4, 1941).

Harsh skin cleansers have frequently been found to be the cause of dermatitis rather than the materials being handled or manufactured. This is especially true of materials hard to remove from the skin. A milder and yet effective skin cleanser is composed of a sulfonated oil (either animal or vegetable), a wetting agent and optionally a small amount of trisodium phosphate or sodium hexameta phosphate. This cleanser has been very useful in cases of eczema and defatted skins in which olive oil was previously used as a cleanser. It has also been used in cases of atopic eczema in children.

- 765 Sudden Appearance of an Occupational Eczema Among Most of the Workers in a New Division of a Chemical Plant. J. Rochstead. *Nordisk. Med.*, 2, 982-986 (1941). (Scandinavian).

Eczema appeared among the workers in an experimental laboratory after using hex-nitrodiphenylamine. The affected men gave positive results with epicutaneous tests. During illness sensitivity improved and normal persons were easily sensitized. Urethan ointment decreased the effect of the chemical.

- 766 Mule-Spinner's Cancer. E.M. Brockbank. *Brit. Med. J.*, pp. 622-623 (April 26, 1941).

Experience in this subject was gained by the author from seeing 150 mule-spinners with epithelioma of the scrotum. Over 80% were on the left side. The spindles throw off onto the men's clothing and being of a mineral carcinogenic type, readily produces skin cancers. Periodic examinations are of the utmost importance. Substitution of harmless oils is suggested.

772. The Effect of Sodium Thiosulfate on Excretion of Arsenic. E.T. Cedar, L. Zon and M.E. Klinger. *Vener. Dis. Inform.*, 22, 123-129 (April, 1941).

The pharmacologic action of sodium thiosulfate in the treatment of arsenic poisoning is still a controversial issue. A disparity exists in the results of previous studies in this problem, which might be explained on technical difficulties of arsenic analysis and the selection of subjects. Ten syphilitic patients, each of whom had completed an orthodox course of neoarsphenamine therapy, were selected for this study. Six of them received sodium thiosulfate, while the remaining four were used as controls. The arsenic content of urine and feces was analyzed in these subjects over a period ranging from the 1st to the 23rd day following the completion of the course of neoarsphenamine therapy. The urinary, fecal or total arsenic excretion was not significantly affected by administration of sodium thiosulfate in popularly used therapeutic doses. The question as to clinical efficacy of this compound in the treatment of arsenic poisoning might be raised, as the strongest case for its clinical use has been based on the supposition that it mobilized the excessive arsenic stored in the body depots.

773. Experimental Studies on Aniline Bladder Tumors. Morizumi and I. Nisimura. *Cann.* 34, 146-147 (1940).

In view of the occurrence of bladder cancer among aniline workers, the authors attempted to produce the disease experimentally by o-toluidin and benzidine. Rabbits, guinea-pigs, and rats were used. A 1% solution of o-toluidin in olive oil was injected subcutaneously 4 times a week in 0.1 cc doses. In other experiments o-toluidin and benzidine were dissolved in chloroform, in the ratio of 5%, and the solutions were applied to the skin of the back every other day.

Bladder papilloma was produced in animals receiving injections of o-toluidin that survived over 100 days. Rabbits were especially resistant to the toxic action of the chemical and showed a high incidence of papilloma. Benzidine proved more toxic, but when animals withstood the treatment long enough this substance also produced atypical proliferation of bladder epithelium. Unfortunately, for the proper evaluation of the experimental results numbers of animals used and of those developing papilloma are not given. Ruesper produced neoplastic lesions of the bladder in 9 of 16 dogs treated with beta-naphthylamine.

- The Effect of Calcium and Phosphorus on the Metabolism of Lead. J.B. Shields and H.H. Mitchell. *J. Nutrition.* 21, 541-552 (June 10, 1941).

1. A low content of calcium or of phosphorus or of both in the diet induced a high retention of lead in comparison with diets containing higher mineral levels. In fact, the only method of securing lead storage in adult rats on the moderate concentration of dietary lead used (32 p.p.m.) is to lower the calcium content of the diet to inadequate or borderline levels.
2. Excessive dietary levels of calcium and phosphorus are not appreciably more protective against the assimilation of lead by the body than the levels approximating the requirements. This statement applies only to the moderate levels of dietary lead employed.
3. Under the imposed conditions of variable dietary concentrations of calcium and phosphorus, the retention of calcium runs in a diametrically opposite direction to the retention of lead.
4. Under conditions of practical nutrition, an adequate intake of calcium and of phosphorus presumably protects the body against appreciable assimilation of the low levels of dietary lead involved in the usual lead hazard of modern life. This protection is more effective in the adult than in the adolescent for any given concentration of calcium and phosphorus; possibly because the mineral metabolism of the bone trabeculae is considerably less intense in the adult than in the growing organisms.

- 775 Lead Encephalopathy in Children and Adults: Clinicopathologic Study. A.J. Akelaitis. J. Nerv. and Ment. Dis., 93, 313-332 (March, 1941).
The post-mortem study suggests that the structural changes in children and adults are a result of edema with exudation and hyperplastic changes in the leptomeninges and endothelial cells of the blood vessels. The symptoms in adults are similar to those of any brain inflammation, and diagnosis rests on the presence of a lead line.
- 776 Behavior of the Alkali Reserve and the pH of the Urine Before and After Injections of Calcium and Magnesium. R. Maestri and B. Bareggi. Med. del Lavoro 32, 53-70 (1941). (Italian).
Thirteen cases of lead poisoning were treated by injection of calcium chloride and magnesium sulfate. The authors conclude that some degree of acidosis is present in all cases of lead toxic. The alkaline reserve increases after the injection of calcium and increases after injection of magnesium sulfate. No change is shown in the urine pH.
- 777 Lead Storage Battery Manufacture in the State of Illinois. G.W. Daubenspeck and C.E. Gifford. Div. Publ. Inspect. Illinois Dept. of Labor, Chicago, Tech. Paper No. 1, (March, 1941).
A report of conditions found in industry and recommendations of needed changes in equipment and in processes. Importance of air cleanliness is stressed and data from sampling with the impinger in various operations is given.
- 778 Nicotine and Internal Secretion. A Danger to Women Working in Tobacco Factories? P. Gumbrecht and A. Lohmeyer. Arch. f. exp. Path. u. Pharm., 195, 143-151 (1940). (German).
The authors showed in a previous publication (same issue, pp. 121-142), that the reproduction organs and the thyroid are the most sensitive of the endocrine glands to nicotine. Two hundred eighty tobacco workers and 472 textile workers were investigated; no difference was found, although the tobacco workers complained more frequently of dysmenorrhea. Overstraining (combined work in factory and home, a long walk to work, etc.) probably causes symptoms referable to the thyroid which were frequently encountered.
- 779 Experimental Poisoning by Selenium with Special Regard to its Effects on the Bones. F.K. Bauer. Arch. f. Gewerbepath., 10, 112-132 (1940). (German).
Chronic poisoning of animals with selenium is reported. Bone changes are described and illustrated with microscopic sections. Metabolic changes are shown. The amounts of selenium found in the organs was very tiny.
- 780 Phosphine Poisoning (Animal Experiments). I. Acute and Subacute Poisoning. W. Müller. Arch. f. exp. Path. u. Pharm., 195, 184-193 (1940). (German).
The widespread use of insecticides which give rise to phosphine suggested these experiments. It was shown that in concentrations of 1:40,000 death occurred after 4 hours; with 1:50,000, after two exposures of four hours each; with 1:100,000, after seven exposures of 4 hours each. Concentrations of 1:200,000 could be endured for two months for four hours daily. One animal which had been exposed to such a concentration for five days died when the concentration was increased to 1:70,000 at the end of the first four hours. Previous exposure had diminished the resistance.
- 781 T.N.T. (Trinitrotoluene). Ind. Data Sheet No. D-Chem. 38. National Safety Council. Nat. Safety News. 44, 38, 40 (September, 1941).
Poisoning from TNT may take place in three ways: through respiration, by ingestion, or by absorption through the skin. In addition to the systemic effects, dermatitis, through contact with the skin, can also occur. Precautions for prevention are outlined.

- 782 Effects of Yellow Phosphorus and Arsenic Trioxide on Growing Bones and Growing Teeth. C.O. Adams and B.G. Sarnst. Arch. Path., 30, 1192-1202 (1940).

A generalized toxic effect of both substances was observed as manifested by a reduction in the rate of weight gained and bone growth. Yellow phosphorus produced a band of increased density, the formation of which was attributed to a diminished resorption of cartilage matrix and bone. A disturbed calcification of the dentin occurred in animals receiving the yellow phosphorus and arsenic trioxide. These studies are of theoretical interest in revealing the effects of yellow phosphorus and arsenic trioxide on two types of calcified matrix.

- 783 Value of Vitamin C for Benzene Workers. O. Libowitsky and H. Seyfried. Wien klin. Wochenschr., 53, 543-544 (1940). (German).

The authors claim that in workers exposed to benzene and its homologs, they often find symptoms typical of avitaminosis C. This is particularly true in the months in which there is a vitamin C deficiency in the food and by higher concentrations of vapors due to closed windows (November to April). Rumpel-Lede congestion experiments showed 6.3% positive with the highest percentages in the winter months. Among the 39 cases with positive Rumpel-Lede tests were five cases with "clear benzene damage," in four cases the blood showed "exceptionally low leucocyte counts," in the fifth case there was a "moderate leucopenia and anemia of high degree." The cases were treated with ascorbic acid and 19 became negative to the Rumpel-Lede test. Vitamin C may be used as a prophylactic in exposures to benzene.

- 784 Masks for Protection Against Formaldehyde. Queries and Minor Notes. J.A.M.A. 116, 2639 (June 7, 1941).

The activated charcoal used in many mask canisters will absorb formaldehyde "to a large degree." Although heavy concentrations of formaldehyde are rare, it might be better to have workers wear supplied-air or oxygen masks. The toxic limits for formaldehyde have not been fixed although 20 p.p.m. has been suggested.

What is the rôle of employee health in industrial relations?

Are any new health hazards arising in this period of emergency production?

What's new in the study of aluminum powder?

What are the latest legal trends?

What is the audit of sick absenteeism showing?

For the answer to these and scores of other pertinent questions in the field of employee health, plan to attend the Foundation's annual meeting Nov. 12-13.

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