

Air Hygiene Foundation
4400 Fifth Avenue
Pittsburgh, Pa.
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REFERENCES TO RECENT LITERATURE ON INDUSTRIAL DISEASES

(A) News Items

- 862 ANNUAL FALL MEETING OF AIR HYGIENE FOUNDATION HELD NOVEMBER 17, 1938.
More than 200 executives from 101 industrial concerns attended the third annual fall meeting of Air Hygiene Foundation held at Mellon Institute, Pittsburgh, on November 17, 1938. The executives, from the four corners of the country, heard reports on latest advances in the protection of employee health. A dozen federal and state agencies sent representatives. Reports covered recent engineering and medical developments in industrial hygiene; state codes governing health hazards, and latest legal, social and economic trends. The program included findings from researches conducted under grants from Air Hygiene Foundation at: University of Pennsylvania for improving methods for large scale medical examinations of industrial workers; The Sargent (N.Y.) Laboratory for studies of "mixed" dusts and "protector" dusts in combating dust diseases; Harvard University for two graduate fellowships for industrial engineering studies. Other speakers stressed the broad benefits for management, labor and the community resulting from this collective effort by employers toward improving health in industry. Proceedings of the meeting with texts of the papers will be published in the near future by the Foundation and copies sent to members.
- 863 NATIONAL SILICOSIS CONFERENCE REPORTS PUBLISHED. U.S. Dept. of Labor, Div. of Labor Standards, Bulletin No. 21, Parts 1,2,3,4 (1938). These are final reports of the four committees appointed in April, 1936, following the Conference in February of that year. They are: Bulletin No. 21, Part 1, Report of the Committee on Prevention of Silicosis through Medical Control; Part 2, Report of the Committee on Prevention of Silicosis through Engineering Control; Part 3, Report of the Committee on Economic, Legal and Insurance Phases; and Part 4, Report of the Committee on Regulatory and Administrative Phases. They are obtainable from Superintendent of Documents, Washington, D.C. for 15 cents each.
- 864 EMPLOYEE HEALTH STATISTICS AS COMPARED TO U. S. PUBLIC HEALTH SERVICE NATIONAL AVERAGE.
The Foundation has recently received a copy of a bulletin board notice of the Procter & Gamble Company, Ivorydale, Ohio, which compares the health of their employees to the general average of all industrial workers as compiled by the U.S. Public Health Service. The tabulations are divided into three groups: respiratory diseases, digestive diseases and miscellaneous diseases. Figures for men and women are separated. The incidence in each case among Procter & Gamble employees is significantly lower than the average for all industry. The Foundation would be glad to receive and to call attention to similar data from other companies.

NOVEMBER 1938
REPORT AIR HYGIENE FOUNDATION



865 GRADUATE IN INDUSTRIAL HYGIENE AVAILABLE FOR EMPLOYMENT.

A recent graduate with a Master's Degree in Industrial Hygiene from Massachusetts Institute of Technology will be available for employment after the first of the year. Besides his extensive studies in Industrial Hygiene, he is also a graduate Sanitary Engineer. He is well recommended, both personally and as a student. Further details will be furnished to anyone having a possibility of an opening.

(B) Papers on Dust, Dust Diseases and General Industrial Hygiene.

- 866 LIST OF RESPIRATORY PROTECTIVE DEVICES APPROVED BY THE BUREAU OF MINES. H. H. Schrenk. U.S. Bur. of Mines, Information Circ. No. 7030 (July 1938). Obtainable from Div. of Information, Washington, D. C.
In our Bulletin for November 1938 (Abstract No. 795), we included a list of respirators approved since our Engineering Bulletin No. 2, Part 2 was issued. This list included the above Bureau of Mines Circular and its First Supplement. The following respirators are listed in a Second Supplement to that Circular, issued November 12, 1938:

SCHEDULE 19A -- SUPPLIED-AIR RESPIRATORS.

Type C -- Air Line Respirators.

2. Willson Air Line Respirator Models GA, GB and GC. Approval No. 1912, issued to Willson Products, Inc., October 7, 1938.

SCHEDULE 21 -- MECHANICAL-FILTER RESPIRATORS.

Lead Dust --

4. Willson Respirator No. 750L. Approval No. 2125, issued to Willson Products, Inc., October 19, 1938.

Type A and Lead Dust.

5. No. 46 Dupor Respirator. Approval No. 2124, issued to H.S. Cover, October 3, 1938.

- 867 ETIOLOGY OF PNEUMOCONIOSIS. L.U. Gardner. J. Am. Med. Assoc. 111, 1925-36 (November 19, 1938).

In an article prepared for the Council on Industrial Health, American Medical Association, the author covers the complete etiology of silicosis and the pneumoconioses. He first reviews the historical aspects of silicosis and the work of Collis in 1915, and Gye, Kettle and Purdy in 1922 whose theories still dominate modern concepts. He describes different methods of experimenting with dusts to determine toxic effects. Intravenous injections of dilute suspensions of particles in remote parts of the body have given tests which simulate the action of dusts in the lungs. The action of these types of dusts is considered: free silica, silicate, asbestos, silicon carbide, nonsiliceous minerals, and mixtures of free silica with other minerals. The inhibitory action of certain minerals mixed with silica is discussed and the subject is being given more attention in recent experiments. The solubility of silica is another hypothesis not yet determined satisfactorily and several methods used in this phase of the subject are described. Factors of particle size, protective action of upper respiratory tract and individual susceptibility are discussed. The article is an authoritative review of the pneumoconioses and modern theories regarding their pathology.

- 868 DUST AND PULMONARY DISEASE. A.J. Vorwald. N.Y. State Jour. Med. 38, 1103-9 (August 15, 1938).

This is an excellent general article in which the author presents the material simply and logically. Atmospheric concentrations and exposure are discussed briefly and the great importance of an exhaustive dust-exposure history is pointed out. Inert and active dusts are considered. Asbestosis and silicosis

are described simply. Mention is made of the recognized but still mysterious effect of other dusts plus silica. The paper provides an excellent introduction to persons who have not followed the literature on silicosis.

- 869 SILICOSIS AND SIMILAR DUST DISEASES. MEDICAL ASPECTS AND CONTROL. R.R. Sayers and R.R. Jones. Pub. Health Repts. 53, 1453-71 (August 19, 1938). While different definitions of silicosis may be expected to express different views, all have one thing in common--that the cause is silica or quartz. The use of quartz, or other forms of silica (opal, flint, chalcedony) is surprisingly prevalent in industry, and it was estimated that 9% of all industrial workers in one manufacturing center were employed where the silica hazard required consideration. Estimates as to numbers exposed, at least to some degree, vary from 500,000 to 1,200,000. The authors review the characteristics of dusts which produce silicosis, the methods of estimating exposures in particle-hours or particle years and characteristics of individual susceptibility. Most silicates are not dangerous dusts but may cause some fibrosis of the lungs. A notable exception is asbestos, an anhydrous magnesium silicate which causes serious pulmonary changes. Anthracosilicosis is discussed briefly with examples of its incidence among coal miners. In the prevention of silicosis from a medical standpoint the most important feature is a periodic medical examination in which evidences of tuberculosis should be particularly noted.
- 870 A STUDY OF A FATAL CASE OF INCOMPLICATED SILICOSIS. A.R. Riddell, C.M. Jephcott. and D.A. Irwin. J. Ind. Hyg. & Toxicol. 20, 566-75 (November 1938). The authors describe a unique case of silicosis which was characterized by exposure to a pure form of silica and which was uncomplicated by pulmonary tuberculosis. The man operated an improperly equipped sandblast for 6 years, experiencing at the end of 5 years, pains in the chest, causing him to seek medical advice. Later other symptoms, as dyspnea, cough, expectoration, developed which necessitated hospitalization 4 months prior to death. A complete description is given of the clinical picture, most important among them being the fact that radiological pictures had indicated a complicating tuberculosis though no bacilli could be found in the sputum. Pathologically the fibrosis was not excessive and was linear rather than nodular. At autopsy no tuberculosis was noted and the case emphasizes the necessity of a guarded clinical opinion regarding diagnosis of complicating tuberculosis.
- 871 NUTRITIONAL CONDITION OF SILICOTICS. G. Schlomka, K. Naumann and A. Bechstein. Klin. Wchnschr. 17, 999-1003 (1938). (German). The authors studied the diets of healthy rock cutters and miners and miners with silicosis of varying degrees. The average nutritional index in healthy stone cutters was +1.69 (for 33 years) and in miners with silicosis II, +2.51 (for 42 years). On the basis of very careful statistical examinations and evaluation the authors conclude: that silicotics tend to a real excess weight, that this tendency to excess fat increases with the degree of silicosis and that silicosis is not an organic disease but a general one. There is an opposing view that the weight increase is due to change in the mode of living resulting from the disease and invalidism.
- 872 THE SOLUBILITY OF SILICEOUS DUSTS AND THE INHIBITORY ACTION OF ADDED DUSTS. A.C.R. Whitehouse. J. Ind. Hyg. & Toxicol. 20, 556-65 (November 1938). The solubility of the various kinds of dusts is one of the most important factors in the many theories regarding causes of silicosis. In this study, the author has examined the solubility of different dusts in a 1 per cent solution of sodium carbonate to simulate the slightly alkaline liquid in lung tissue,

NOVEMBER 1938

THE AMERICAN

although it is admitted that the sodium carbonate solution is much the more active solvent of the two. The dusts used consisted of small particles (0 to 6 microns) separated where necessary by elutriation. Of the dusts examined, flint was by far the most soluble; the others in order of their solubility were quartz, bull quartz, whinstone (64 per cent total silica, no free silica), granite, coal measure sandstone (49 per cent free silica), sericite and stone dust (a type of shale with 79 per cent free silica). The addition of shale dusts to quartz decreased its solubility in the sodium carbonate, while limestone dusts had little or no effect. The greatest reduction in solubility of quartz (78%) was caused by gypsum. Coal dust also decreased the solubility of silica, depending on the type and particle size, the values for reduction ranging from 4 to 71 per cent.

- 873 THE NATURE OF MINERAL PARTICLES IN SPUTUM AND ASH OF THE LUNGS OF SILICOTICS. M.E. Burke and P.F. Kerr. *J. Ind. Hyg. & Toxicol.* 20, 535-55 (November 1938). Comparatively little work has been done in determining the nature of the mineral particles in the sputum of silicotics. In this paper the authors describe a series of microscopic investigations of the sputum of silicotics, and of the lung ash of silicotics, tuberculous patients and controls with no silica exposure. Although they were able to find doubly-refracting particles of the nature of quartz in the sputum, with the present technic available it is difficult to positively identify the minerals. Samples of ash of the lungs of 4 tuberculous (non-silicotic) subjects were found to contain large isotropic aggregates of a calcareous phosphatic nature but no sericite, feldspar or quartz. Samples of the ash of silicotics were found to contain quartz and occasionally feldspar. No sericite was found in the ash of any of the proved silicotic cases.
- 874 MICROCHEMICAL INVESTIGATIONS ON SILICEOUS DUSTS. J.W. Matthews. *Analyst* 63, 467-77 (July 1938). For a complete chemical analysis of dust a sample of the order of 50 mg. is required, but for an investigation of the solubility and an examination of the extract, samples of at least a few grams are needed. Two types of apparatus are used for collecting samples, a filter with a filter-pad of a volatile solid and a labyrinth. For silica estimations after determination of loss at 100°C. and loss on ignition, the dust is fused with three to four times its weight of sodium carbonate. The melt is taken up in 1 ml. of water and neutralized by exposure to hydrochloric acid vapor. The silica is made insoluble by evaporation three times with hydrochloric acid, followed each time by drying at 105°C. The residue is taken up in water with about 0.25 ml. of hydrochloric acid and filtered through a King filter-stick for the iron and aluminum determinations. The insoluble matter is ignited and weighed and the silica volatilized by treatment with hydrofluoric acid and evaporation in the presence of water containing dilute sulfuric acid. The crucible is finally ignited for 2 minutes and re-weighed. For the determination of silica in aqueous extracts King's colorimetric method is used, comparing yellow ammonium silico-molybdate with a standard picric acid solution. Iron is never present, in the samples tested, in large amounts compared with aluminum, and the hydroxy quinoline method has been used satisfactorily. Calcium and magnesium are determined as the oxalate and ammonium phosphate respectively. For determining sodium and potassium in a separate sample a simplified micro-Berzelius procedure is very satisfactory. Lime reduces the solubility of silica and an example is given of a striking reduction in the solubility of asbestos in the presence of lime or of cement.

- 875 BASOPHILIC ERYTHROCYTES IN SILICOSIS. Thomas A. Neal. *Am. Rev. Tuberc.* **34**, 629-31 (November 1938).
The author, in reviewing the literature on pneumoconiosis, frequently found references to the possible increase in the number of punctate stippled erythrocytes caused by various industrial dusts, other than lead and its compounds. If this were true, it would devalue the test for lead absorption and poisoning. However, from several series of examinations of the blood of workers in dusty, non-lead trades, and of hospital patients suffering from tuberculosis or silicosis with tuberculosis, no evidence was found to indicate that common industrial dusts, other than lead or its compounds, provoke an increase in the usual number of red cells containing basophilic granules.
- 876 SILICOSIS IN THE BRITISH COALFIELDS. W.E. Cooke. *Tubercle* **19**, 289-306 (1938). (British).
The wide differences between the incidence of silicosis in various British coalfields is attributed to differences in the overlying rock, the incidence being higher where the rock is high in silica. Sericite is present in all the shales and rocks, but today the consensus of opinion is against these particles playing any part in the production of silicosis. Two types of silicosis occur among coal miners: one, seen among tunnelers who drill mostly rocks rather than coal, is undistinguishable from silicosis found in other occupations; the other is true silico-anthracosis seen among miners exposed both to silica and to coal dust. The latter is the hard black lung type with masses of consolidation due to quantities of coal dust becoming entangled in the fibrosis set up by the presence of the silica particles. This form does not seem to render the patient liable to tuberculous infection, as does pure silicosis. Similar differences are found in the Pennsylvania coal fields, and the conclusion is drawn that the differences in occurrence of silicosis are due entirely to the different exposure to silica dust. Suggestions for abating the dust hazard are made.
- 877 DYSPNEA IN ANTHRACOSILICOSIS. A CLINICOPATHOLOGIC STUDY. Robert Charr and J.W. Savacool. *Penn. Med. J.* **42**, 35-8 (October 1938).
Among 160 anthracosilicotic patients at White Haven (Pa.) Sanatorium during the last 3 years, the most frequent and distressing symptom, aside from cough, was dyspnea. The history of development was the same in every case, the dyspnea becoming noticeable after 10-15 years in the mine, and developing in the following years until it became necessary to give up all forms of physical labor. In the absence of definite signs of cardiac decompensation it was difficult to decide whether dyspnea was due to pulmonary damage following dust inhalation or to myocardial degeneration, a differentiation which, if established, would have a bearing on management of such cases. Dyspnea in anthracosilicosis is not always proportional to the reduction in the vital capacity, while it is to the length of the pulmonary circulation time. In fact, it appears that this dyspnea is largely due to cardiac insufficiency. Myocardial degeneration is a common finding in anthracosilicotics. When a patient is studied for compensation, possible myocardial insufficiency, as well as the pulmonary damage should be studied. Such study may be aided by the estimation of velocity of pulmonary circulation.
- 878 FACTORS WHICH DETERMINE THE DIAGNOSIS OF SILICOSIS. C.L. Sutherland. *Brit. J. Radiol.* **11**, 414-21 (June 1938). (British).
The author interprets the radiological factors which today characterize the diagnosis of silicosis. His descriptions, discriminations and evaluation of these factors are elucidated by 10 large-size radiographic reproductions.

- 879 THE DETECTION OF CRYSTALLINE SILICA IN LUNG TISSUE BY X-RAY DIFFRACTION ANALYSIS. H.C. Sweany, R. Klaas and G. L. Clark. *Radiology* 31, 299-307 (1938).
The findings of quartz lines in the x-ray diffraction pattern of dried and ground lung indicates the presence of sufficient quartz to produce or to have already produced silicotic fibrosis. X-ray diffraction methods afford an accurate and absolute means of detecting that substance in concentrations down to 0.2 per cent and for differentiating silicosis from other dust diseases. Analyses are illustrated by numerous case histories.
- 880 ALUMINUM METAL AS A PREVENTIVE OF SILICOSIS. M. Bauer. *Arbeitsschutz* 1937, 291-2 (1937). (German).
Six of a group of 13 rabbits were subjected 16 hours a day for 20-24 weeks to quartz dust. The others were subjected to the same dust with 1 per cent aluminum powder. The first group showed manifestations of acute typical silicosis, and in the second group these manifestations were much less marked. The metal aluminum seemed to act by decreasing the solubility of silica; the metal is more active than its salts.
- 881 WHAT IS AN OCCUPATIONAL DISEASE? T.N. Bartlett. *Safety Engineering* 78, 51-2 (September 1938); 35-6 (October 1938); 51-2 (November 1938).
A few years ago there was not much concern as to "What is an Occupational Disease" or how it was to be answered in the future. It was thought that Workmen's Compensation Laws would solve all of the problems. Not much attention was paid to the experience in other countries where compensable diseases were listed; a few states named the diseases, but it was necessary to resort to the courts in those states not having specific lists. There is logic and reasoning in compensating for occupational disease the same as for occupational accident; diseases contracted by all mankind, as bronchitis, asthma, heart diseases, are usually not classed as occupational. In recent years the causes for concern are mainly these: more disease cases have developed in which it is claimed, but not conceded, that the disease is "occupational," and the cases must be adjudicated by interpreting the facts and applying them to statutes intended to cover only accident cases; occupational diseases are usually of slow contraction and difficult to diagnose. Amending the Compensation Laws to include occupational diseases creates the possibility of extending the law beyond its scope and intent. Many claims for alleged occupational diseases have been precipitated with unnecessary litigation and uncertainty, and the situation is becoming acute. The author suggests no remedy but states that the situation cannot be eased by merely defining occupational disease as "a disease contracted because of, or resulting from, occupation."
- 882 INDUSTRIAL MEDICINE'S CHALLENGE TO THE INTERNIST. R.T. Johnstone. *J. Am. Med. Assoc.* 111, 1741-5 (November 5, 1938).
Industrial medicine has advanced a great deal in the past few years, but it has not developed as rapidly as the needs demand. There should be more publicity given to industrial medicine in the universal medical press so that the general practitioner may be more correctly informed as to its importance. The important exigency presented by industrial medicine today is for more correct diagnoses. There are many cases which are beyond the scope of surgery and preventive medicine and which should require the services of internists. The author suggests more cooperation between the medical schools, the post-graduate system, the medical press and the insurance group in interesting the internist in industrial medicine.

- 883 **INDUSTRIAL EXHAUST VENTILATION. FIELD MEASUREMENTS AND THEIR INTERPRETATION.** John L. Alden. *Heat. & Vent.* 35, 47-50 (November 1938). See note on Abstract No. 524, July, 1938.
Field measurements on exhaust systems are a necessary part of the engineer's work in collecting data for design, checking new systems for acceptance and to check systems in maintenance. The instruments most commonly used are described and technic for their use is outlined. The most useful single instrument is the common "U" tube manometer which measures static pressures. The impact and pitot tubes and methods of making pipe traverses with them are described. Methods and technic for measuring various hood coefficients are briefly outlined. Since every design involves some degree of speculation and because erecting mechanics may have made some changes in the original plans, it is necessary to check each installation for actual conditions existing. One particularly helpful section of the paper is the diagram of an exhaust system with the static pressures tabulated for indicated points at the initial and at subsequent conditions. A discussion is then given of each, with causative factors where the readings indicate a change in operating conditions. Another example is given where the friction losses are analyzed and suggestions are made for possible changes which will result in less friction loss and greater power savings. The paper is an aid in giving a clearer understanding of the hydraulics of exhaust piping systems.
- 884 **PRELIMINARY INDUSTRIAL HYGIENE SURVEY OF THE GRANITE AND MARBLE MEMORIAL ESTABLISHMENTS IN KANSAS.** C.C. Dills and A.L. Nichols. *Kansas State Board of Health, Industrial Hygiene Section, Lawrence, Kansas. Investig. Rept. No. 2*, 22 pp. (June 1938).
A report of a preliminary investigation of 35 out of 81 memorial establishments in Kansas to determine to what extent, if any, dust hazards existed. Little stone manufacturing is done in the State, most stones being cut and surfaced at the quarry or by the wholesaler, and a majority of the establishments visited were small plants doing only pneumatic lettering and fine surfacing or sand blast lettering. A few pneumatic rough surfacing machines were in operation but most of them were exhausted. Dust counts were made at typical operations and while no definite conclusions were drawn it seemed advisable to make further studies. Most important recommendations are: sandblast lettering should be done in approved cabinets; all pneumatic tools, either hand operated or for rough surfacing, should be exhausted, using approved hoods; filters should be placed in all exhaust systems to prevent return of dust to working rooms.
- 885 **TAKING THE IMPURITIES OUT OF AIR.** H.C. Murphy. *Heat. & Vent.* 35, 39-41 (November 1938).
The air cleaning problem as presented to the engineers is complicated both by the range in size of the dust particle and by the diverse nature of the impurities to be removed. However, effective equipment to accomplish air cleaning is now available. This article, condensed from a series of talks on air conditioning at Michigan State College, discusses the general problem and gives a short description of the common methods used today. The methods in use are viscous impingement, dry filters, electrical precipitation, and thermal air cleaners, and each is covered briefly. A possible relation between air pollution and respiratory diseases is also discussed.
- 886 **DUSTLESS BATCHING OPERATION WITH NEW MATERIALS SET-UP.** *Cer. Ind.* 51, 32-3 (November 1938).
A description is given of the new batching set-up in a modern glass plant. The operations are entirely mechanized and foolproof. A complete new dust exhaust system is connected to the weighing hoppers, bucket elevator, belt conveyor, surge hopper at the mixer and the magnetic separator and it keeps all operations almost entirely free of dust.

- 887 FIVE HUNDRED QUICK WAYS TO PROFITS. Factory Man. & Main. 96, 80-5, 136-40 (November 1938).
In Factory Management and Maintenance for November, 1938, there are 500 brief suggestions by plant men on items of plant management. They are divided into 8 convenient sections covering different phases of plant operation. In a section on Heating, Ventilating and Air Conditioning there are some 57 suggestions, including a few on dust, gas and fume removal.
- 888 GROUP PURCHASE OF MEDICAL CARE BY INDUSTRIAL EMPLOYEES. L. Brown. Industrial Relations Section, Princeton University, Report No. 54, 53 pp. (1938). Obtainable for \$1.00 from the University. Address: Princeton, N. J.
The general problem of the need of medical care (other than for industrial accidents and diseases) is discussed. Recent trends toward group benefit and hospitalization organizations and the attitude of organized medicine to them are also covered in general. Representative plans of organization of the employees of six companies are described. In some cases they are entirely financed by the employees and in some cases partly by the companies, especially at the beginning. They are, however, all employee organizations distinct from management.
- (C) Papers on Industrial Poisons, Cancer, Dermatitis, etc.
- 889 OCCUPATIONAL DERMATOSES. AN EDUCATIONAL PROGRAM. C.G. Lane. J. Am. Med. Assoc. 111, 1521-3 (October 22, 1938). The first of a series of six articles on industrial dermatoses in the above issue. Abstracts of the other five follow. Diseases of the skin due to occupation represent from 10 to 12 per cent of all skin disease according to best available statistics. They represent about 65 per cent of all occupational disease, excluding accidents. Disability is mostly partial and temporary but is often complete or permanent. The author stresses the need for more publicity on the subject and an understanding of the problem by employers, employees, insurance companies, doctors, etc. He considers that postgraduate training for medical students would be of practical value and outlines a plan for such study.
- 890 THE INCIDENCE OF OCCUPATIONAL DERMATOSES AND THEIR CAUSES IN THE BASIC INDUSTRIES. L. Schwartz. J. Am. Med. Assoc. 111, 1523-7 (October 22, 1938).
It is difficult to correlate accurately the records gathered by many observers from various localities and industries regarding the occurrence of occupational dermatoses. A conservative estimate is that 1 per cent of all industrial workers are affected annually. 30 per cent of the cases occur in the metal industry; domestic (cleaners, dish washers, barbers) and food industries are second and third, respectively, with the building and construction industry following. Leading chemical causes are: alkalis, petroleum products, solvents, paints, metals and metal plating, acids, dyes, rubber compounds and resins.
- 891 THE PRACTICAL ASPECT OF THE PREVENTION OF INDUSTRIAL DERMATOSES. E.D. Osborne and J.W. Jordan. J. Am. Med. Assoc. 111, 1533-6 (October 22, 1938).
Industrial dermatoses are to a large extent preventable. There are two common types: (1) those due to primary irritants and (2) sensitization dermatitis. The prevention of type (1) depends upon mechanical protection and education of workers. The prevention of type (2) depends upon (a) proper selection of workers, (b) elimination of unnecessary hazards, (c) the prevention of exposure to sensitizing substances, and (d) the early recognition of the dermatitis and its proper management. Occupational keratoses and cancer of the skin may best be prevented by personal cleanliness, use of protective measures, use of non-carcinogenic oils and the prompt removal of the keratoses (warts, callouses, etc.). The preventive measures given in the article are largely general and are not specific for any certain agent causing dermatoses.

IN REPLY TO THE EDITOR
November 1938

NW88-0009765

- 892 INDUSTRIAL DERMATITIS. DEFINITIONS AND CRITERIA FOR DIAGNOSIS. M.B. Sulzberger and C.W. Finnerud. J. Am. Med. Assoc. 111, 1528-32 (October 22, 1938). Dermatitis is defined as an inflammatory disease or condition of the skin and is called a subcategory of the all-inclusive term—dermatosis. The authors explain the very complicated subject with the help of numerous lengthy tables and the points covered offer a distinct aid in the diagnoses of skin diseases. They emphasize three points: (1) the tendency to confuse purely medical considerations with legal interpretations in the diagnosis, (2) the nondiagnostic appearance of many eruptions and other complicating factors which make it difficult to attach portions of causal blame, and (3) that in some cases the complexity of the problem is so great as to make it impossible for even expert and honest physicians to diagnose as industrial or non-industrial.
- 893 THE COMPENSATION LAWS AND RELATED MEDICOLEGAL CONSIDERATIONS. N.B. Foerster. J. Am. Med. Assoc. 111, 1542-7 (October 22, 1938). The medical provisions of many compensation laws are inadequate and ambiguous, and the properly selected representatives of medicine could do much to advise in the construction and revision of compensation laws. Probably the first most difficult problem is caused by the definition of a compensable injury which is different in so many states and which in most cases is too general. Two types of coverage—"blanket" and "schedule" are discussed briefly. Other items considered are: choice of physician by the patient, compensation for nondisabling disease, medical boards, and new legislation.
- 894 ANALYSIS OF CLAIMS IN INDUSTRIAL DERMATOSES. J.G. Downing. J. Am. Med. Assoc. 111, 1536-42 (October 22, 1938). The analysis is confined to cases in Massachusetts where the Industrial Accident Board is composed of seven lay members. It should be pointed out, however, that most industrial dermatoses cases do not reach the courts but that the diagnoses of physicians is usually accepted. In 2000 cases examined privately for insurers, 845 were classed as non-occupational, 1004 were classed as occupational and in 151 it was not diagnosed. Of the 2000 cases, but 3% of the diagnoses were contested. Briefs are given of 28 cases which had come before the Board.
- 895 DERMATITIS. M.R. Mayers. Safety Eng. 76, 9-12 (November 1938). The author describes a few unusual cases of dermatitis caused by common substances, to which a comparatively small number of people may be allergic. Among them are soaps, oils, face powder, and alkalies. Emphasis is made of varying susceptibilities of different individuals.
- 896 HANDICAPS IN DIAGNOSING INDUSTRIAL DISEASE. C.P. McCord. Nat. Safety News 38, 34-6, 72-3 (November 1938). Many industrial diseases are almost self-diagnosing but some are undiagnosed or misdiagnosed, due to the lack of information by the physician. Part of the difficulty lies in the variance of definition and terminology of the state laws. Physicians should give more attention to work-histories. They should not be too prone to put all blame on industrial exposure. On the other hand, a more complete study of work-history might reveal an industrial cause, unknown or unsuspected by the workman. Another difficulty in diagnosis is that the numerous chemicals used in industry are in most cases known only by a trade name or symbol; and new chemicals of unknown toxicity are continually being introduced. The author suggests remedies for the situation in the hope that it will result in more correct diagnoses for the betterment of all concerned.

NOVEMBER 1938

AMERICAN

INDUSTRIAL

NWBB-0009766

- 897 MYCOTIC ECZEMA AMONG CABINET MAKERS. Jansion, Hyronimus and Konchner. Bull. et mem. Soc. Med. Hopit. de Paris pp. 953-62 (June 6, 1938). (French).
A cabinet maker with a troublesome eczema had difficulty in finding the cause. All tests, with every possible material, were negative and the only clue was a sensitivity to mycotoxins. Then finally he was tested on mouldy wood and it was found that this was the most likely source of the eczema.
- 898 MEDICAL SUPERVISION OF BENZENE PLANT WORKERS. A.G. Kammer, N. Isenberg and M.E. Berg. J. Am. Med. Assoc. 111, 1452-5 (October 15, 1938).
Industrial physicians, at first concerned primarily with treatment of accidents and then with diagnosis and treatment of all occupational diseases, must now devote considerable efforts to preventive practice. The physician's essential part in a preventive program is constant supervision over the physical status of the employee. This applies particularly well to a plant using benzene. The most important test for a periodic physical examination for benzene workers is the urine sulphate test. It has been established arbitrarily that when inorganic sulphates in the urine fall below 80% of the total urine sulphate, the drop is an indication of excessive benzene exposure. Hematologic studies are also necessary or helpful and a discussion is given of changes in the blood picture from exposure to benzene concentrations. Periodic determinations of benzene concentrations in the air are helpful also, primarily to check efficiency of ventilation systems. It is stated that significant concentrations may be detected by the sense of smell.
- 899 BENZENE POISONING WITH BIZARRE EXTRAMEDULLARY HEMATOPOIESIS. E.A. Gall. Arch. of Pathology 25, 315-26 (March 1938).
A case is presented of poisoning in a 45 year old leather worker who was exposed for 4 years to benzene, ethyl acetate and bentanol. The worker whose job he took over had died of "anemia." The case is followed through completely with complete laboratory data together with very detailed biopsy and autopsy findings. In addition to the usual symptoms found, other points of special interest are discussed at length, including: the relatively youthful and active appearance of the fibroblastic nuclei in a few areas of the bone marrow suggesting the "radiation osteitis" described by Martland in radium poisoning; the marked hemosiderosis found as long as 4 months after exposure to benzene; and massive metaplastic erythropoiesis in the spleen and, to a lesser degree, in the liver--and extramedullary hematopoiesis--indicating not a compensatory mechanism, but efforts toward a typical regeneration in a liver and spleen intrinsically damaged by benzene.
- 900 CHANGES IN GASTRIC CHEMISM IN BENZENE INTOXICATION. G. Zolezzi. Med. del Lav. 28, 275-83 (1937). (Italian).
A study of 8 cases of benzenic anemia in workers in the rubber industry. In view of the importance of gastric secretion on erythropoiesis, it is useful to carry out a complete systematic study of the gastric chemism in such patients, whether acute or chronic. The examination must comprise white and red corpuscle counts, determination of hemoglobin, analysis of gastric juice after a test meal (150 gm. of bread and 200 gm. water or tea) with determination of total acidity, free hydrogen chloride, and peptic power. In such cases, and particularly in severe chronic intoxication, there is always a decrease in the values of the gastric chemism, with alteration of the blood formula. It would therefore seem that there is a relationship between the state of anemia and the gastric secretion, and, in the present instance, between benzenic intoxication and disturbances of the gastric chemism.

NOVEMBER 1938

STEWART

HBB-688767

- 901 METHEMOGLOBINEMIA AND ITS MEASUREMENT. D.O. Hamblin and A.F. Mangelsdorff. J. Ind. Hyg. & Toxicol. 20, 523-9 (October 1938).
In the abundant literature on methemoglobinemia there are many apparently contradictory reports which may be due partially to its difficult identification and measurement. Clinically its accurate quantitative determination may frequently be of great diagnostic and prognostic value in cases of poisoning by drugs, and by industrial physicians in cases of poisoning by nitro and amino derivatives of the aromatic series such as aniline oil, nitrobenzene, dinitrobenzene, para and meta nitroaniline, etc. The authors describe a method which they believe to be accurate and which may clear up much of the uncertainty existing regarding methemoglobinemia. The method should be applicable also to sulphemoglobin and to other hemoglobin derivatives.
- 902 HEMATOLOGICAL INVESTIGATIONS IN SOUTH INDIA. V. THE EFFECT OF ALTITUDE ON HEMOGLOBIN CONTENT. G. Sankaran and K. Rajagopal. Ind. J. Med. Res. 25, 971-7 (April 1938). (India).
The authors examined 36 British soldiers who had lived at Madras (sea level) for two years and were then moved to Wellington (altitude 6000 ft.). At first the mean value was 12.84 gram %. This rose to 17.46 after one week and at the end of the fifth week was 20.38, after which there was very little change. The mean content of 125 men living 2 years at 6000 feet was 20.38 gram %. It evidently takes about 3 to 4 weeks for acclimatization.
- 903 THE LEAD CONTENT OF HUMAN BLOOD. C.E. Willoughby and E.S. Wilkins, Jr. J. Biol. Chem. 124, 639-57 (August 1938).
Blood specimens from 189 individuals with histories showing no abnormal lead exposure were analyzed for lead, using the dithizone method. The values ranged from 0.00 to 0.09 mg. lead per 100 grams blood, with a most probable value of 0.025, plus or minus 0.002 mg. This is significantly lower than the most probable value of previous investigators. Lead was found to be absent in 90% of the 58 samples in which clot and serum were analyzed separately, contrary to the findings of Blumberg and Scott, and Teisinger. Blood lead values as high as 0.1 mg.% may occur without indisputable clinical evidence of plumbism.
- 904 A RAPID SIMPLE METHOD FOR THE DETERMINATION OF LEAD IN SMALL QUANTITIES OF URINE. D.O. Shiels. J. Ind. Hyg. & Toxicol. 20, 581-8 (November 1938).
A rapid, simple and inexpensive dithizone method for the determination of lead in the urine in small quantities is described. An analysis can be carried out in about an hour, and the results are accurate to about 6 per cent of the results as determined by Taylor's method over a range of 0.05 to 0.75 mg. per liter.
- 905 CAN LEAD POISONING CAUSE GASTRIC-DUODENAL ULCERS. C. Csapai. J. Ind. Hyg. & Toxicol. 20, 521-2 (October 1938).
The possibility of the development of gastric-duodenal ulcer caused by lead poisoning has been suggested occasionally in the last few years. Several authors have reported the incidence of ulcers among lead workers, with figures that ranged from 25 to over 50 per cent. The present author, who is connected with the Central Diagnostic Station of the Hungarian Social Insurance Institute, reports the examination of 8975 men from 1932 to 1936, of which number 1611 were suffering from gastric ulcers, an incidence of 17.9 per cent. Classified as to occupation, agriculture workers were highest, 27.3%, and lead workers lowest at 8.8%. From these statistics of a comparatively large number of patients, the author concludes that lead poisoning is not necessarily a cause of gastric ulcers.

- 906 **METHODS FOR THE DETECTION AND DETERMINATION OF CARBON MONOXIDE.** L.B. Berger and H. H. Schrenk. U.S. Bur. of Mines Tech. Paper No. 582, 30 pp. (1938). Obtainable from Supt. Documents, Washington, D. C. for 10 cents cash. This paper gives a summary and a brief description of the various methods of carbon monoxide determination. Seven distinct methods are described with one or two variations on several of them. References are given to original papers for more complete detail. The most accurate method is the carbon monoxide recorder, used in vehicular tunnels, which records concentrations as low as 1.0 p.p.m. It is based on the principle that electric potentials are generated in thermocouples by oxidation of carbon monoxide in contact with a catalyst hopcalite. A portable recorder based on the same principle is used extensively. Several simple methods which may be suitable for certain conditions are described.
- 907 **THE ELECTROCARDIOGRAPHIC CHANGES FOUND IN 22 CASES OF CARBON MONOXIDE (ILLUMINATING GAS) POISONING.** W.H. Stearns, C.K. Drinker, and T.J. Shaughnessy. Am. Heart J. 15, 434-47 (April 1938). Carbon monoxide asphyxia, even though severe enough to cause death, may produce no important electrocardiographic changes. Changes in the T waves and in the S-T segments occur most frequently. Paroxysmal auricular fibrillation may occur, as a rule in patients within the age group in which any physiologic insult or trauma may cause this condition. No cases of auriculoventricular block definitely attributable to carbon monoxide was found.
- 908 **THE CONQUEST OF AN OCCUPATIONAL DISEASE: PHOSPHORUS POISONING IN LUCIFER MATCH MAKING.** T. Oliver. J. Roy. Inst. Public Health & Hyg. 1, 860-6 (August 1938). (British). In this paper the author records his personal experiences in connection with the phosphorus poisoning which was rife in the lucifer match industry half a century ago.
- 909 **INDUSTRIAL PHOSPHORISM, A SYNTHETIC CRITICAL REVIEW.** A. Briganti. Folia medica 24, 487-506 (1938). The author suggests that phosphorus necrosis has only a historical significance since white phosphorus is no longer used in the match industry. But red phosphorus and other phosphorus compounds are widely used in industry. The author describes "little phosphorism" on the basis of animal experiments described in the literature and gives data regarding the human disease, skin diseases and burning from phosphorus.
- 910 **ANNUAL REPORT OF THE INDUSTRIAL INSPECTORS' OFFICE AND MINING OFFICIALS FOR 1935 and 1936.** Leymann. Zbl. f. Gewerbehyg. 15, 137-41 (1938). (German). A review of the activity of the German industrial inspectors. The increase of industrial physicians in Prussia and the recent installation of them in Thuringe is emphasized. The number of compensated industrial diseases has increased. Two diseases that are relatively high in number are bladder tumors, in workers in a betanaphthylamine plant, and tar cancer.
- 911 **THE USE OF NEW EQUIPMENT AND HELIUM GAS IN A WORLD RECORD DIVE.** Edgar End. J. Ind. Hyg. & Toxicol. 20, 511-20 (October 1938). The problems met with in deep sea diving are reviewed and the development of a new self-contained diving suit is described. The new equipment renders the diver independent of the surface for his air supply and allows independent ascent to the surface with timed stops for decompression. The diver controls the atmosphere he breathes, an artificial mixture of 80 per cent helium and 20 per cent oxygen. Helium is used because it does not dissolve in the tissues under high pressures as does nitrogen. A record dive of 420 ft. was made with the apparatus.

- 912 SULFUR DIOXIDE IN TIRE REBUILDING OPERATION. Connecticut Health Bulletin, State Health Dept. 52, 253, (September 1938).
A relatively new potential sulfur dioxide exposure has appeared in automobile tire service stations where tire rebuilding operations are conducted. The rubber forming the new tread is cemented to the old tire and heated to about 300°F for about one hour. When the mold is opened considerable smoke and fumes are given off and much of the sulfur in the rubber is converted to the dioxide. The gas is an irritant and may cause irritation of the eyes or to the mucous membranes of the respiratory tract.
- 913 REMOVAL OF SULFUR FROM FLUE GASES. A.W. Anthony, Jr. Power Plant Eng. 42, 725-6 (November 1938).
The author discusses some of the economic problems in the recovery of sulfur dioxide from flue gases. The recent use of alkaline absorbing solutions which can be recirculated increases the possibilities and reduces the cost of recovery. The salvage value of the sulfur obtained cannot hope to pay for the total removal equipment, but will pay a large part of the cost. Reference is made to previous articles.
- 914 THE EFFECT OF IRON AND MANGANOUS SULFIDES. C.G. Santesson. Skand. Arch. Physiol. 79, 169-92 (1938). (Skandinavian).
Neither iron sulfide nor manganous sulfide appear to be injurious when given by mouth. Injected subcutaneously they produce a toxic effect which manifests itself especially in bleeding of the liver. The pharmacology of sulfides in general is reviewed.
- 915 THE MEASUREMENT OF AIR CONDITIONS. C.P. McCord and W.N. Witheridge. J. Am. Med. Assoc. 111, 1647-54 (October 29, 1938).
In the control of artificial atmospheres it is necessary to know not only of the variations that may occur but also of the methods and instruments used in measuring the different factors in the quality of the air. The five principal factors are: air temperature, humidity, air movement, radiation and cleanliness of air. The report discusses methods and instruments for measuring each. The various items covered are: the sling psychrometer and other instruments to measure humidity; the katathermometer, electrical anemometers, mechanical and other anemometers for measuring air movement; and various methods of measuring radiation and convection. A single index including each of the factors would of course be desirable but none is existent. The "effective temperature index" is probably the best, but as it does not embrace radiation effects, its use in the winter months is restricted.
- ✓ 916 AIR PURIFICATION. Edward L. Joseph. J. Inst. Heat. & Vent. Eng. 8, 170-99 (1938).
Methods for removing air contaminants—solids, gases and bacteria—are reviewed briefly. The methods include dry and wet filters and various dust collectors. The author recommends the use of ionizers for the removal of offensive industrial and domestic odors and gives examples of their use in purifying the air in food storage plants and breweries and in removing carbon disulphide and hydrogen sulfide from an industrial gas.
- 917 THE HEATED THERMOMETER ANEMOMETER. C.P. Yaglou. J. Ind. Hyg. & Toxicol. 20, 497-510 (October 1938).
Anemometers which depend on the cooling of hot bodies by air currents have long been known for their low speed sensitivity, but certain difficulties have detracted from their conventional use. The new instrument described here is

NOVEMBER 1938

STANDARD

1938

1938

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November 1993

References to Recent Literature - 14.

capable of measuring accurately air velocities of 10 to 6000 f.p.m. This type of anemometer has best application on air movement in rooms or in front of hoods but may be used also in small pipes. It consists of an ordinary glass thermometer with an electric coil surrounding its bulb. Small dry cell batteries supply the heating current and the voltage is regulated by a rheostat. By varying the voltage any velocity can be measured with accuracy. The velocity depends upon voltage, temperature of heated thermometer, and the temperature of a second control thermometer; and may be taken from appropriate tables.

- 918 HOSPITAL AIR CONDITIONING. C.P.Yaglou. J.Am.Med.Assoc. 110, 2003-9 (June 11, 1938).

The author discusses special problems in hospitals where air conditioning has been found useful—in operating rooms (for minimizing the explosion hazard), in post operative wards, premature nurseries, oxygen chambers, etc. Air conditioning of an entire hospital is considered too expensive now, but portable units are practical.

- 919 ATMOSPHERIC POLLUTION, WITH SPECIAL REFERENCE TO SULFUR AND GRIT. Birkett Wylam. Colliery Guardian 157, 570-1 (September 23, 1938).

The author calculates that from the 180 million tons of coal burned in the United Kingdom in 1936 without removal of sulfur, 2 million tons of sulfur are burned to sulfur dioxide, which is capable of producing 6 million tons of sulfuric acid. Figures are also given for deposition of solid matter, varying from 7 to 46 tons per square mile. Several installations in British factories for removal of sulfur dioxide and dust are described.

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