

Air Hygiene Foundation of America, Inc.
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REFERENCES TO RECENT LITERATURE ON INDUSTRIAL DISEASES

(A) News Items

794 FALL MEMBERSHIP MEETING OF AIR HYGIENE FOUNDATION

The annual fall membership meeting of Air Hygiene Foundation will be held at Mellon Institute, Pittsburgh, on November 17. More than 200 representatives of industrial concerns in all parts of the country will hear progress reports on the researches which the Foundation is supporting at The Saranac (N.Y.) Laboratory, University of Pennsylvania, Harvard School of Public Health, Mellon Institute. These studies seek "how" measures for promoting health and preventing occupational diseases. Besides these and the medical, engineering and legal committees, the meeting will hear discussions of the broad social aspects of industrial health as well as consideration of the industrial relations and public relations side of the subject.

The program includes:

- "Social Aspects of Industrial Health." Dr. Willard E. Hotchkiss, Carnegie Institute of Technology.
- "Engineering Progress Toward Further Protection of Industrial Health." Report of Preventive Engineering Committee, Including Plans for 1939. Philip Brinker, Chairman.
- "State Codes for Control of Industrial Health." T.F. Hatch, New York State Division of Industrial Hygiene.
- "Legal Trends of Interest Respecting Industrial Health." Theodore C. Waters, Chairman, Maryland Occupational Diseases Commission.
- "Medical Progress Toward Further Protection of Industrial Health." Report of Medical Committee, Including Plans for 1939. Dr. A.J. Lanza, Chairman.
- "Some Practical Considerations Concerning Lung Changes among Silica Workers." Dr. E.P. Pendergrass, University of Pennsylvania Hospital.
- "Report on Further Researches on 'Mixed' Dusts and 'Protector' Dusts." Dr. Leroy U. Gardner, Director, The Saranac Laboratory.
- "Comparison of Film and Paper in Roentgenographic Work." Dr. S. Reid Harrison, The Moore School X-Ray Laboratory.
- "Industrial and Public Relations Aspects of Industrial Health." V.P. Brown, Executive Secretary, National Industrial Sand Association.



References to Recent Literature - 2

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

- 795 LIST OF RESPIRATORY PROTECTIVE DEVICES APPROVED BY THE BUREAU OF MINES. H.H. Schrenk. U.S. Bur. Mines Information Circ. No. 7030 (July 1938). First supplement to this Circular was printed on August 1, 1938. Obtainable from Div. of Information, U.S. Bureau of Mines, Washington, D.C.
- The following respiratory protective devices have been approved by the Bureau of Mines since our Preventive Engineering Series, Bulletin No. 2, Part 2, was issued, February, 1938. There have been slight changes in their classifications which we will attempt to clarify for our Bulletin.

SELF-CONTAINED OXYGEN BREATHING-APPARATUS. No changes.

GAS MASKS APPROVED UNDER SCHEDULES 14, 14A, 14B, 14D.

Type A -- No changes.

Type B -- Organic Vapor Masks.

2. Davis Organic Vapor Mask. Approval No. 1417, issued to Davis Emergency Equipment Co., Inc., May 3, 1938.
3. Acme Organic Vapor Mask. Approval No. 1418, issued to Acme Protection Equipment Co., Inc., May 13, 1938.
4. Bullard Organic Vapor Mask. Approval No. 1419, issued to E.D. Bullard Co., July 15, 1938.

Types AB, C, D, N -- No changes.

SUPPLIED-AIR RESPIRATORS APPROVED UNDER SCHEDULE 19 AND SUPPLEMENT (A NEW CLASSIFICATION WHICH REPLACES "HOSE MASKS," BUT INCLUDES THEM AS THE FIRST TYPE A.)

Type A -- Hose Masks.

8. Acme Supplied-Air Respirator, Type A. Approval No. 1910, issued to Acme Protection Equipment Co., Inc., July 16, 1938.

Type B -- Special Hose Masks without Blowers. (A new classification.) No approvals to date.

Type C -- Air-Line Respirators. (A new classification.)

1. M. S. A. Airline Respirator. Approval No. 1909, issued to Mine Safety Appliances Co., July 15, 1938.

Type CE-- Abrasive Blasting Helmets, Hoods or Masks. (A new classification.)

1. M.S. A. Abrasive Mask. Approval No. 1907, issued to Mine Safety Appliances Co., July 15, 1938.
2. Pangborn Sand Blast Helmet, Type DD-4. Approval No. 1908, issued to Pangborn Corp., Hagerstown, Md., July 13, 1938.
3. Sly Purair Helmet. Approval No. 1911, issued to W.W. Sly Manufacturing Co., July 16, 1938.

MECHANICAL-FILTER DUST, FUME, AND MIST RESPIRATORS. APPROVED UNDER SCHEDULE 21.

Type A -- Mechanical-Filter Respirators -- Dust.

17. Filto-Ring No. 28 Respirator. Approval No. 2122, issued to Hygeia Respirator Co., March 23, 1938.

Type B -- Mechanical-Filter Respirator -- Fumes. No approvals to date.

Type C -- Mechanical-Filter Respirator -- Mists.

2. Willson Respirator No. 750. Extension of approval No. 2119, for protection against chromic acid mist and mist from vitreous enamels with no harmful vapors. Does not cover use with lead-containing mists.

Lead Dust. Under a new subheading "Lead Dust," only three respirators are now listed. They are: No. 1 and No. 3, listed in our Bulletin under "Mechanically Generated Lead Dust" and a new addition:

3. Willson Rotiform Respirator No. 2006. Approval No. 2123, issued to Willson Products, Inc., April 18, 1938.

Type A and Lead Dust. (A new classification.) Under this classification are four respirators already listed in our Bulletin under "Mechanically Generated Lead Dust." The four are: Nos. 2, 4, 5 and 6.

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References to Recent Literature - 3

- 796 THE ETIOLOGY OF SILICOSIS. R.R. Sayers and R.R. Jones. Radiology 30, 297-308 (March 1938).

The authors cover very completely the entire field of etiology of silicosis. They present tables showing the trades in which there is exposure to silica, size-frequency distribution of various industrial dusts, (in order to show the importance small particles have in producing silicosis), a typical occupational record, the estimation of the individual's total dust exposure, the dust exposure of moulders, and an English table showing the standardized mortality from respiratory tuberculosis in occupations with rates above average. Based upon these tables, their own experience and experiments and upon a full bibliography, all phases of the etiology of silicosis are discussed and the present day beliefs reviewed.

- 797 ROENTGENOLOGIC ASPECT OF SILICOSIS. E.C. Ernst. Radiology 30, 285-93 (March 1938).

The author discusses the pathology of silicosis and its interpretation by x-ray. The difficulties of correct diagnosis are illustrated by reproduction of films and by enlargements of portions of these films. The variations of the x-ray picture of the normal chest are discussed and illustrated. The author emphasizes the importance of a proper consistent technic in taking films. He suggests as minimum requirements for an ideal set up "an x-ray transformer developing from 400 to 500 milliamperes capacity in a tube containing a target focal spot no greater size than 4.5 mm., 6 foot target film distance, with an exposure time of one-twentieth of a second." It is emphasized that x-rays alone are not sufficient evidence for a silicosis diagnosis, but must be correlated with history of exposure.

- 798 A STUDY OF SILICOSIS. Philip B. Matz. Am. J. Med. Sci. 196, 548-59 (October 1938).

Silicosis is called the chief occupational disease in this country and its seriousness is due to the fact that it is conducive to the inception of pulmonary tuberculosis. Emphasis is laid on the necessity, in cases of suspected silicosis, in getting complete occupational exposure which includes daily hours of work, dust concentrations, total time of exposure, and other details necessary in the correct diagnosis. In the present study a classification is made of 167 silicotic veterans in the hospital at Washington. Of them, 30% were first, second or third degree silicosis; 11% were cases of silicosis with non-tuberculous infection; 42% were cases of silicosis with tuberculosis; 16% were classified as silico-tuberculosis and 1 case was diagnosed as asbestosis. While tuberculosis is the principal complicating infection in silicosis, other infections such as pneumonia, lung abscess, and bronchiectasis, are frequently encountered.

- 799 THE RELATION OF PULMONARY FUNCTION TO FIBROSIS AND EMPHYSEMA. J.A. Miller and Q. Rappaport. Ann. Intern. Med. 11, 1644-61 (March 1938).

The relation is discussed in terms of the authors' conception of lung function, namely, that the lungs have special functions ("breathing surface creation" and "self-cleansing") analogous to the special functions of other organs. The paper concerns the thesis that pulmonary fibrosis and emphysema represent primary disturbances in the lung function, i.e., a form of organic asthenia rather than purely structural processes which lead secondarily to interference with the efficiency of the ventilating system.

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- 800 A CASE OF ACUTE TUBERCULO-SILICOSIS. K.R. Moore. Med. J. Australia 2, 58 (July 9, 1938).

The author thinks that infection seems to have a stronger and more rapid effect on the coarse radiological type of silicosis than on the fine. A 40 year old man given a pre-employment examination said he had worked one year in a gold mine but otherwise had had no dusty experience. There was no pulmonary abnormality. Five years later (apparently after work in a mine) he was re-examined and the peribronchial markings were slightly exaggerated but were only what one would expect at his age. On July 14, 1936, after one year's work on the surface, an early tuberculosis lesion was seen, but there was no clinical sign or symptom. Fourteen months later an extensive lesion occupied two-thirds of the upper left lung and there was generalized mottling of the rest of both lungs. The patient felt well but had a slight cough, raised some sputum and had occasional night sweats. The sputum contained many Mycobacteria tuberculosis. The silicosis had developed rapidly in the 21 months from January 1935 to September 1937, and the author considers this as due to the supervention of the infection.

- 801 THE PREVENTION OF SILICOSIS ON THE MINES OF THE WITWATERSRAND. REPORT ON THE INVESTIGATIONS OF THE MINERS' PHTHISIS PREVENTION COMMITTEE. A.J.L. Pretorius, Chairman. 286 pp. Johannesburg, Union of South Africa, June 1937, Price 3s, (\$1.25).

This is a complete, comprehensive report of the work being done to prevent silicosis in the miners on the Rand. It gives a summary of the progress up to about 1916, with the present report covering the investigations since that time. There are 9 chapters with numerous sub-topics which give extensive discussions of these items; composition of dusts, methods of dust determination, thermal precipitator, production of dust and methods of control, removal of dust from suspension in air, methods of improving quality of air by ventilation, and medical aspects of the problem. Each subject is considered in detail and methods are extensively described, with figures and diagrams where necessary. The reduction in silicosis rates, which were exceptionally high in the earlier periods of operation, has been remarkable. The ore dust contains a very high percentage of free silica (50-70%), necessitating low concentrations in the air. Since 1924 the content in the mine air has been kept at 1 mg. per cu. meter or less.

- 802 AN EXPERIMENTAL STUDY OF THE TOXICITY OF VARIOUS TYPES OF QUARTZ. D.A. Irwin and C.S. Gibson. Canadian Med. Assoc. J. 39, 349-52 (October 1938). Reprints probably obtainable from Banting Institute, University of Toronto, Toronto, Canada.

Clinical evidence suggests that the type and incidence of silicosis in one mining area varies from that in another despite the finding that the concentration of the dust and its quartz content may be practically the same. To account for this, one suggestion was that the type of quartz present in the aerial dust in one area might be more toxic than that found in another. This paper reports the results of an experimental study of the tissue response when various types of quartz, found in Ontario mines, were finely ground and injected subcutaneously. Fourteen different types of quartz dusts were used and observations made on the site of injection at intervals for two years. The findings of the study were that any appreciable variation in the reaction produced by mine dusts containing equal amounts of quartz is not due to the toxicity of the type of quartz.

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- 803 TUBERCULOSIS OF INTESTINES IN TUBERCULOUS ANTHRACOSILICOSIS. R. Charr and A.C. Cohen. Am. J. Med. Sci. 196, 83-7 (July 1938).
Complete autopsies were made on 42 cases of anthracosilicosis plus pulmonary tuberculosis, and on 75 cases of pulmonary tuberculosis without anthracosilicosis. Of the former, 19% had intestinal tuberculosis and 51% of the latter. The incidence of intestinal tuberculosis in each group was apparently higher in the age groups below 30.
- 804 A STUDY OF ASBESTOSIS IN THE ASBESTOS TEXTILE INDUSTRY. W.C. Dreessen, J.M. DallaValle, T.I. Edwards, J.W. Miller, and R.R. Sayers. Pub. Health Bulletin No. 241, 126 pages (August 1938). Obtainable for 20 cents, cash, from Superintendent of Documents, Washington, D. C.
This is a report of a complete survey of the asbestos textile industry in North Carolina made in conjunction with the State Health Department. The report is comprehensive in its coverage of the subject and includes a good annotated bibliography of 63 references to asbestosis. It describes the industry, the processes in the manufacture, numbers employed in each process, dust counts made at various locations and incidences of asbestosis among the various employees. The incidence of the disease among the workers increased rapidly with increased dust exposure, and it was found that one-fifth of the workers with an exposure of 50 to 99 million particle-years and half the workers having an exposure of over 100 million particle-years had asbestosis. The threshold limit for exposure has been set tentatively at 5 million particles per cubic foot and it was found possible by methods already at hand to obtain this concentration in all processes. The medical part of the report is complete with physical examination data, laboratory findings, x-ray pictures and case histories.
- 805 INVESTIGATION ON CONTROLLING PNEUMONIA BY IMMUNIZATION OF WORKERS IN THOMAS SLAG MILLS. M. Gundel & E. Homann. Dtsche. med. Wchnschr. 64, 917-21 (1938). (German).
In an earlier paper, our Abstract No. 8, 1937, the authors had shown that pneumonia in Thomas slag mill workers was caused exclusively by pneumococci types I, II, III, but chiefly by type II. Since that time they have begun immunization in a plant where pneumonia had occurred. A Behring-Werke serum was used on 79 men in the mill, the remaining 49 refused it. No serious results followed its use. The serum was given in July and since then no pneumonia has appeared in the plant. Though it has not proved itself conclusively, in February, 1938, pneumococci of the above types could be found but very seldom, and less frequently than in another mill. The authors conclude that the results call for further work with the serum.
- 806 MEDICAL AND LEGAL ASPECTS OF TUBERCULOSIS AS AN OCCUPATIONAL DISEASE AND AS AN ACCIDENTAL INJURY. Mary G. Mack. National Tuberculosis Assoc. Social Research Series No. 6 (June 1938). Obtainable from the Association, 50 West 50th Street, New York, for \$1.00 postpaid.
Generally speaking, tuberculosis is not recognized as an occupational disease, but there is a growing experience in the courts with reference to suits and claims for compensation because of tuberculosis contracted in ordinary course of industrial employment. The purpose of this bulletin is not to be an exhaustive summary of all cases, but rather to present representative decisions with discussions of various problems involved. Included is a review of medical opinions on the status of tuberculosis as an occupational disease and as an accidental injury; abstracts of court decisions on each of the two latter phases and a digest of the workmen's compensation laws, by states, as they effect occupational diseases.

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- 807 WHAT IS AN OCCUPATIONAL DISEASE? Thomas N. Bartlett. Safety Eng. 76, 51-2, 85-6 (September & October 1938).
Two interesting and instructive articles on the general subject of occupational disease and compensation law. On the completion of the series in the November issue, they will be abstracted in this Bulletin.
- 808 FREQUENCY AND DURATION OF DISABILITIES CAUSING ABSENCE FROM WORK AMONG THE EMPLOYEES OF A PUBLIC UTILITY, 1933-37. W.M. Gafafer and E.S. Frasier. U.S. Pub. Health Repts. 53, 1273-88 (July 29, 1938).
From the reports of the Boston Edison Company over a five-year period it was found while the frequency of all disabilities showed no downward trend, the average number of days lost per person showed a definite decline. The frequency among females was higher than that among males. Among the men, those who worked outside (linemen, meter readers, repairmen) had the highest rates.
- 809 VENTILATION AND AIR CONDITIONING OF THE MAGMA MINE. C.B. Foraker. Mining Tech. 2, (Tech. Paper No. 979) (September 1938).
This is one of four technical papers appearing in Mining Technology for September, 1938, on the general subject of mine ventilation and air conditioning which will be of value to those interested. Abstracts of the other three papers follow. The journal is a publication of the American Institute of Mining and Metallurgical Engineers, Inc., with publication office at 212 York St., York, Pa. It is bimonthly edition, single copies \$1.00.
The Magma Mine, of the Magma Copper Company, is in Superior, Arizona. The underground temperature of the rock is about 140° at the 4000 foot level, with a thermal gradient of about 1-1/2° per 100 feet. A description is given of the development of the ventilation system and of the auxiliary air cooling systems needed below the 3200 foot level. Diagrams and figures are included together with an itemized account of the final cost of the system.
- 810 AIR COOLING IN THE GOLD MINES ON THE RAND. W.H. Carrier. Mining Tech. (Tech. Paper No. 970) 2, (September 1938).
Under certain conditions it may be less expensive to use artificial cooling methods to eliminate excessive mine temperatures rather than to increase ventilation to accomplish the same results by natural means. In this paper the author presents some of the technical features of the problem of cooling the deep gold mines on the Rand in South Africa. He also discusses the relative merits of surface cooling and underground cooling.
- 811 DIRECT SOLUTION OF PROBLEMS INVOLVING NATURAL VENTILATION. Walter S. Weeks. Mining Tech. (Tech Paper No. 957) 2 (September 1938).
This paper describes a graphical method for estimation of air flow through a mine, produced by natural ventilation alone, or in combination with a fan. To the author's knowledge, only cut and try algebraic solutions have been used previously where multiple paths are involved in mine air movement.
- 812 VENTILATION AND DUST PREVENTION IN THE BUTTE MINES. A.S. Richardson. Mining Tech (Tech. Paper No. 969) 2 (September 1938).
A previous paper, our Abstract No. 625, 1937, described to a larger extent the technical features of the ventilation methods. The present paper briefly reviews the system and gives more special reference to additional measures used in dust prevention. The two most important items in reduction of dust are adequate ventilation to dilute the concentrations in working places and the use of wet drilling methods. Additional precautions used are listed briefly, most prominent of which are the extensive use of water in wetting down dusty locations

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and forced ventilation of dead end spaces. Dust counts have been made periodically and the results, as shown in a table, are exceptionally good.

- 813 NOTES ON SOME DUST PROBLEMS IN COAL MINES. A. M. Bryan. Trans. Instn. Min. Engrs. London, 95, 182-4 (May 1938). (British).
This is a paper on dust in a coal mine in relation to its effect on explosive qualities of mine dusts. It does not consider the physiological aspects of dusts. The subject of coal mine explosions is covered in general and the relation between the volatile matter in coal and its inflammability is discussed briefly.
- 814 POSSIBILITY OF MANGANESE POISONING IN PYROLUSITE MINES. H.E. Buettner and E. Lenz. Arch. f. Gewerbepath. u. Gewerbehyg. 7, 672-84 (1937). (German).
The lungs of workers in the Giessen pyrolusite mines show a high silica content and relatively little manganese and the symptoms observed are those of silicosis, although the silica content of the ore is only 14.5%. Ores containing practically no silica are much less toxic and animal experiments show that manganese compounds inhaled pure are eliminated again almost completely. The part played by manganese is probably to irritate the lung tissues and facilitate the deposition of silica.
- 815 DUST CONTROL IN INDUSTRY. T.C. Angus. Ind. Welfare 20, 171-7 (May 1938). (British).
This short paper gives an interesting survey of the dust hazard, methods of dust estimation and of dust control which should be very valuable to welfare workers and others concerned with industrial management. Special exhaust hoods designed by the author for the protection of operatives "fettling" small pressed pieces of earthenware are described and illustrated. A novel feature in these hoods is that they are illuminated, so that there is better light in the working position than before. The light is so directed that when the work is effectively illuminated it is in the space best ventilated by the exhaust stream.
- 816 EXCUSE MY DUST. Safety Eng. 76, 79 (October 1938).
An editorial tells of the virtual elimination of dusty roads by perseverant public sentiment. Now that public sentiment has been directed toward elimination of dust in industry it is probable that more attention will be paid in the near future to this phase of dust. Enactment of codes controlling dust hazards is certain to become more extensive.
- 817 A NEW WAY TO PROTECT GRINDERS AGAINST SILICOSIS. Kleditz. Arbeitsschutz. pp. 168-9 (1938). (German).
The German Iron & Steel Industry (the insurance group organized to combat accidents and industrial diseases) has invited the polishing and grinding employers of Germany, at its cost, to Remscheid, the center of the grinding industry. The purpose is to show them how effective artificial grinding stones are and how silicosis can be lessened by the substitution of artificial stones for sandstones. Today half the stones used are artificial. Insurance rates in plants using sandstone are 50% higher.
- 818 THE DUST HAZARD IN INDUSTRY. E.L. Middleton. Trans. Cer. Soc. 57, 190-9 (May 1938). (British).
The author classifies the response in the tissues to dusts as: absorptive response (calcium carbonate); inert response (talc or coal dust); and proliferative response (quartz or flint). He describes briefly the physiological factors in respiration, and the characteristics of dangerous dust exposure. Industries in which silicosis is most prominent are, in order of their importance: sandstone

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quarrying, coal mining, pottery industry, metal-grinding (greatly reduced in recent years) and metalliferous mining. A brief description of the pottery industry in relation to silicosis is given together with means for the prevention of the disease.

- 819 AIR FILTRATION. Tell Nelson. J. Am. Med. Assoc. 111, 1298-301 (October 1, 1938). A brief discussion of the various effects of dust, including pollens as well as siliceous and poisonous dusts, is followed by a description of the various types of air filters and their efficiency for different classes of dust. The fundamental requirements for air filtering devices are quoted from Rowley: (1) high efficiency, or dust arresting power; (2) low resistance to the flow of air through the filter; (3) high dust-holding capacity, or long life in service; (4) economy in first cost and upkeep; (5) freedom from odors; (6) fire resistance; (7) uniform efficiency over a wide range of air temperature; and (8) low moisture absorption. The general types of filters include air washers, dry filters, viscous coated filters, electrical precipitators and dynamic precipitators. Dry filters are usually made from felt, closely woven cloth, cotton mats and cellulose material, and are well adapted for installation in homes and hospitals. Their loss in efficiency is slight when properly cared for. Viscous coated filters are made of numerous types of material such as spun glass, metal wool or fibrous material, packed loosely in a frame, and coated with a thick viscid oil which retains the dust. The efficiency of this type increases with use. Electrical precipitation apparatus removes fine particles not collected by filters, but requires a supplementary filter. The dynamic precipitator has a high efficiency. Air filtration has received much attention from the medical profession within the past 10 years, and its use in removing allergic pollens is now recognized, as well as in preventing industrial diseases.
- 820 MODERN METHODS OF REMOVING DUST. F. Prockat. Staub No. 6, 249-87 (1937). (German). The various methods of dust removal are discussed briefly, and exhaust ventilation systems are described more fully. A series of illustrations is given, showing faults in the shape of hoods and in the arrangement of the exhaust ventilating shafts. For instance, the shafts may have sharp bends, unnecessary throttle valves or dampers and branch shafts joined to the main shaft with the inlet directed against the current. All such defects tend to cause dust to collect inside the shafts and interfere with the efficient working of the installation. The use of separate dust removing installations for each machine is considered preferable to carrying the dust long distance by a central installation, and the need of completely enclosing some machines, such as shaking sieves, is emphasized.
- 821 GRANITE DUST CONTROL. I. BANKER EXHAUST VENTILATION. Massachusetts Dept. of Labor and Industries, Div. of Occupational Hygiene (May 1938). M. Bowditch, Director. Copies may be obtained from their address at 23 Joy St., Boston, Mass. This four page mimeographed bulletin discusses the essentials of exhaust ventilation of hand-pneumatic tools in banker systems. The exhaust usually consists of a system of ductwork with moveable hoods that are moved about with the tool over the face of the stone. This bulletin gives recommended practices for satisfactory operation of this type of system. Discussed are fan size and speed, duct size, motor capacity and maintenance. For satisfactory operation, a velocity of 200 f.p.m. at a distance of 6" to 7" from the hood, depending on the type, is recommended. The advantage of flanged hoods is shown in permitting a reduction in air flow from 540 to 400 cubic feet per minute.

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822 INDUSTRIAL EXHAUST VENTILATION. STRUCTURAL DETAILS AND SYSTEM PLANNING.

John L. Alden. Heat. & Vent. 35, 47-52 (October 1938). See note on Abstract No. 524 in our July Bulletin.

Mr. Alden discusses, with diagrams, the various details in exhaust piping systems. Most blowpiping is rolled from galvanized sheet steel, riveted or spot welded and soldered. Description is given of the method of forming the pipe and a table is shown giving the thicknesses of metal for pipes of various sizes and service. Description is also given of tapers, elbows, tees, equalizers, dampers, switches and other pipe appurtenances. Rules to follow in reduction of the fire hazard are considered, as are ejector systems, self-clearing mains, and general system arrangement.

(C) Papers on Industrial Poisons, Cancer, Dermatitis, etc.

823 ALLERGY AND OCCUPATION. Erich Urbach. Occupation and Health, Supplement, International Labor Office, Geneva, 9 pp. (January 1938). (One of the supplements mentioned in our Abstract No. 702, October 1938).

The subject of allergy and allergens is covered in detail. Four definite properties of the allergic state are emphasized as proofs of the condition: (1) The existence of a behavior different from that typical of the normal state; (2) specificity, either monovalent or polyvalent; (3) symptomatology independent of the chemical and pharmacodynamic properties of the allergen; and (4) proof that the special properties of the reacting cells are the cause of the abnormal activity. Five therapeutic methods of attack are briefly outlined: (1) prophylaxis by removal of allergic factors; (2) desensitization by gradually increasing doses of antigen; (3) disallergization -- the neutralizing of allergic sensitivity by a "micro-shock" during which period a larger quantity of the allergen may be introduced; (4) metaspecific desensitization by non-specific methods such as by the use of peptone; and (5) a group which includes drugs (adrenaline, atropine, etc.), diet, radiotherapy, etc. Numerous groups of allergens are cited, the most important being dyes, benzene, woods and resins, chlorine, cement, tar, phenols, turpentine, zinc and tin. Treatment sometimes requires special knowledge. Certain legislative aspects of allergy are discussed.

824 NEW POISONING HAZARD IN PRINTING TRADES OF NEW YORK IS REMOVED. New York State Department of Labor. Div. of Industrial Hygiene. Ind. Bull. 17, 424-5 (September 1938)

An example of how the Division of Industrial Hygiene is able to function was shown in the situation that occurred in the rotogravure printing trades in New York. Faster printing presses demanded a faster drying ink, so benzol inks were introduced. Upon hearing of the death in Philadelphia of a worker using these inks, an immediate investigation was begun on the existing plants in New York. Before much could be done, one man was poisoned and later died; many others were found to be in need of hospitalization or medical care. After several conferences with those involved, non-toxic inks were substituted. By this hasty action only the one fatality occurred and the remaining men are well on the road to recovery.

825 COMMON POISONS IN INDUSTRY. E.L. Belknap. Nat. Safety News 38, 78-82 (Oct. 1938)

Poisonings are not frequent in industry comparatively, their total number being about 1% of all causes of disability. The severity and cost, however, loom large in individual cases and they represent an important phase of industrial health. The author lists a few of the important industrial poisons with brief discussion and guiding principles in the use of each. Most important is the fact that the workman should know that the chief danger is through inhalation.

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- 826 SURVEY OF CARBON DISULPHIDE AND HYDROGEN SULPHIDE HAZARDS IN THE VISCOSE RAYON INDUSTRY. Occupational Disease Prevention Division, Dept. of Labor & Industry, Commonwealth of Pennsylvania, Bulletin No. 46, 69 pages (August 1938). Carbon disulphide, an essential in the formation of pure cellulose, is used extensively in the rayon industry. This survey is the first large systematic investigation of that industry in this country although for some time it has been recognized in foreign countries as a serious hygienic problem. The present report, then, is a valuable addition to the literature on carbon disulphide. The procedure in the survey included determinations of concentrations; a questionnaire survey of 159 workers; clinical symptoms, findings and signs of poisoning; and one post mortem study. The most important hazard found was the exposure to carbon disulphide, although hydrogen sulphide, produced in some reactions, is also present in certain processes. The action of carbon disulphide is primarily on the nerves, brain and digestive system and the results of poisoning are serious in many cases. It was confirmed that exposure to the gas can lead to insanity. Described also are other prominent symptoms and tests for early diagnosis. Recommendations are listed and the maximum permissible limits of the gases have been set at 10 p.p.m. by volume, for either gas alone or for a mixture of the two.
- 827 INDUSTRIAL HYGIENE APPLIED TO THE CLOTHING MANUFACTURING INDUSTRY. W.H. Schulze, Am. J. Pub. Health 28, 476-8 (1938) In Baltimore, all clothing manufacturers require a permit for operation, which is issued annually and not renewed unless working conditions are satisfactory. As the results of careful surveys made over several years, great improvements have taken place. The most definite hazard was exposure to carbon monoxide from leaky tubing on gas-fired hand irons and boilers. The extent of hazard has been reduced to one-fifth since the first survey. Similar improvements have occurred in lighting, general ventilation, washing accommodations and toilet facilities. Almost all factories are now fully cooperating.
- 828 ACCIDENT PRONENESS AND ACCIDENT WELFARE. E. Farmer. Indust. Welfare 20, 129-132 (April 1938). (British). Accident proneness means the relatively permanent personal qualities that render some people more susceptible to accidents than others exposed to the same risks. Proper safeguards tend to reduce all accidents, but age and experience are important factors. Causes of accident proneness in individuals can generally be laid to certain obvious factors as youth, nervousness, strain, poor physical attributes, and can in many cases be cured by proper and thoughtful treatment.
- 829 ATMOSPHERIC POLLUTION IN A CITY AND WHAT IT MEANS TO THE ENGINEER. A.D. Singh, F.A. Chambers and I. A. Deutch. Heating, Piping and Air Cond. 10, 647-9 (October 1938). A sulfur dioxide pollution survey was made in Chicago by the City Department of Smoke Inspection and Abatement, together with the Engineering Experiment Station of University of Illinois. The tests ran during the first four months of 1937. About 25 million tons of midwestern bituminous coal containing from 0.7 to 5.0% sulfur is consumed annually in Chicago and vicinity and most of the sulfur leaves the stack as oxides of sulfur, primarily the dioxide. Results of the tests showed that there was appreciable and measurable quantities of the dioxide in the atmosphere, with values as high as 2.12 parts per million by volume. From the engineer's standpoint the most important feature is that sulfur dioxide, in contact with moist surfaces, rapidly causes corrosion.

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- 830 THE CONDENSATION NUCLEI CONTENT OF THE AIR AS RELATED TO AIR FRESHNESS. R. A. Nelson. Heating, Piping & Air, Cond. 10, 473-6 (July 1938). As the result of many determinations made with an Aitken counter in the Pittsburgh area, the author concludes that while air lacks freshness when industrial processes fill it with condensation nuclei, the experiments indicate that the reduction of the nuclei from the high concentrations found in the city to lower concentrations, as those of country air, adds nothing to its freshness. From this he concludes that the concentration of nuclei as produced by an air conditioning system are not a usable index of the freshness of conditioned atmospheres.
- 831 GENERAL REACTIONS OF 274 OFFICE WORKERS TO SUMMER COOLING AND AIR CONDITIONING. F.C. Houghten, A.B. Newton, R.W. Quilley and E. Witkowski. Heating, Piping and Air Cond. 10, 552-6 (August 1938). A large percentage of 274 workers in the cooled offices of the Minneapolis-Honeywell Regulator Company, Minneapolis, reported general satisfaction with air conditioning and an improved ability to withstand hot weather after leaving the cooled space. The votes were 2 to 1 in favor of air conditioning. Of the 32% voting adversely, about 4% stated that their offices were too cool and drafty. Complaints of oppressive humidity and stuffy offices totaled about 3%, while another 3% claimed that they caught colds.
- 832 CHANGES IN COMPOSITION OF SWEAT DURING ACCLIMATIZATION TO HEAT. D. B. Dill, F. G. Hall, and H. T. Edwards. Am. J. Physiol. 123, 412-9 (August 1938). The properties of sweat depend on acclimatization, the rate of sweating, inherent characteristics of the individual, and probably other factors. It becomes more dilute with adaption to hot atmospheres. Its inorganic constituents increase in concentration as sweating becomes more profuse; at the same time, nitrogen excretion diminishes. The susceptibility of some individuals to heat cramps no doubt depends in part on the inability of their sweat glands to reduce sodium chloride loss to a low level.
- 833 OBSERVATIONS ON WATER METABOLISM IN THE DESERT. E. F. Adolph and D. B. Dill. Am. J. Physiol. 123, 369-78 (August 1938). Evaporation loss in the hot and dry climate of Boulder City, Nevada, was found to be eight times as great as that in Boston, Mass., while the output of urine remained constant or else decreased. The concentration of sweat decreased while that of urine increased. Water intake increased proportionally and the weight remained remarkably constant over a 24 hour period.
- 834 HEAT EXCHANGES OF MAN IN THE DESERT. E. F. Adolph. Am. J. Physiol. 123, 486-99 (August 1938). Under the weather conditions of Boulder City, Nevada, it was found that the body may gain heat by radiation faster than is produced chemically, even at rest. When subjects sat in the sun, the heat gained by radiation amounted to about 140 calories per hour, and the heat loss by evaporation was twice as great as that in the shade. Heat accumulation during exercise varied in different subjects according to the rate of sweat secretion and other probably less important factors. Not all persons were equally able to preserve heat balance.
- 835 SIMPLE STAGE PHOTOMETRIC CARBON MONOXIDE HEMOGLOBIN DETERMINATION FOR CLINICAL AND FORENSIC PURPOSES. H. Oettel. Klin. Wchnschr. 17, 1019 (1938). (German). The author has worked out a differential photometric carbon monoxide determining method for the stage photometer which permits carbon monoxide hemoglobin in a drop of blood to be determined accurately within 5 to 10 minutes.

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- 836 USE OF METHYLENE BLUE WITH GLUCOSE IN CARBON MONOXIDE POISONING. A. Sturm and H. Wohlfarth. Arch. Exptl. Path. Pharm. 186, 294-302 (1937). (German).
It had been suggested that methylene blue had a favorable action in treatment of carbon monoxide poisoning but the authors found that chromosmon (a 1% solution of methyleneblue in 10% glucose) had no specific benefit in counteracting the poison in rabbits. A slightly favorable action is shown equally well by a plain solution of glucose.
- 837 ORGANIC LESIONS FOLLOWING UPON INTOXICATION BY CARBON TETRACHLORIDE. G. Zolezzi. Med. del Lav. 28, 289-301 (1937). (Italian).
A description of the functional and histopathological lesions of various organs (especially the liver, spleen, and suprarenal cortex) produced by pulmonary administration to rabbits of doses of carbon tetrachloride sufficient to produce acute or chronic intoxication.
- 838 EXAMINATION OF 40 ELECTRIC WELDERS IN A LARGE PLANT. C. Humperdinck. Mntsschr. f. Unfall. 45, 359-74 (1938).
The author examined 40 electric welders in a poorly ventilated plant. Complaints of stomach ache were especially common. In recent years four of the workers had had pneumonia which was considered as due to the drafts. Although the electrodes had manganese in the covering (15-23%), no definite symptoms of manganese poisoning were found. Other findings were an increased irritability to mechanical stimuli, increased sensitivity to autonomic stimuli and isolated positive Rhomberts. It was uncertain as to whether the stomach aches were due to manganese or to carbon monoxide. Many complained of loss of weight.
- 839 MERCURY POISONING. A REVIEW OF PRESENT KNOWLEDGE. Clark Goodman. The Rev. of Sci. Instruments 9, 235-6 (August 1938).
With the thought in mind that far too few technical men know of the toxic properties of the compounds with which they work, this review is written on the properties of mercury. The two common modes of entry into the body are through the skin and lungs. Information on the absorption through the skin is limited but examples are cited where there were evidences of mercurial poisoning when the skin was painted with weak solutions of mercuric chloride. There are also evidences that concentrations of mercury vapor of 0.25 mg. per cubic meter of air are toxic and may produce chronic poisoning on continued exposure. The vapor pressure of mercury is sufficient to produce this concentration even at only 3% of the equilibrium amount. Precautionary measures for laboratory use are given among which are: ventilation, prevention of spilling and immediate cleaning up, covering of exposed surfaces where possible, use of rubber gloves on contact with solutions, and use of special carbon-iodine masks when extended exposure is necessary.
- 840 MORPHOGENETIC AND TOXIC ACTIVITY OF MONOVALENT AND TRIVALENT THALLIUM COMPOUNDS. N.A. Iljin, P. Hofman, N.N. Melnikov and A.M. Avetisian. Arch. Intern. Pharmacodyn. et. Therap. 58, 371-403 (April 1938). (French).
The authors have made an exhaustive study of the connection between the chemical structure of thallium compounds and their pilotropic and toxic action. Angora rabbits were chosen as the test animals since the experimental moult is so clearly expressed in them. Twenty-seven mono- and trivalent thallium compounds were tested, 16 of which were synthesized for the first time. The threshold moult doses and minimum lethal doses of the monovalent compounds contained the same quantities of thallium acetate. The thallium content of the minimum lethal dose is 14-18 mg. per kilogram body weight for rabbits. The salts of trivalent thallium have the highest biologic action and the toxicity of some of these is higher than that of all other compounds studied.

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- 841 CLINICAL ASPECTS OF THALLIUM POISONING. G. Eruem. Munch. med. Wchnschr. 85, 1024-27 (1938). (German).
Detailed description of a careful and prolonged observation of a case of acute thallium poisoning (suicide). The characteristic white strips on the finger-nails are shown in an illustration.
- 842 ISOLATED THROMBOPENIA FROM CHRONIC BENZENE POISONING. B. Kern. Munch. med. Wchnschr. 85, 1062-3 (1938). (German).
A farmer, who worked a few weeks on a benzene-driven threshing machine in a closed barn, fell ill with symptoms of purpura. The blood picture: 3.4 million red blood count, 8400 white blood count, 6080 thrombocytes, the latter of which fell and then rose after a transfusion. There was numbness and spastic paresis of both arms and legs, especially the left. These symptoms receded but there appeared a left-sided ischia. The author considers that the involvement of the nervous system can be traced to the multiple hemorrhages in the central nervous system tissue, and the ischia he sees as a toxic neuritis.
- 843 CLINICAL AND HEMATOLOGICAL STUDIES ON 9 CASES OF INDUSTRIAL BENZENE POISONING. P. Kissel and L. Pierquin. Bull. et mem. Soc. med. hop. de Paris 54, 1116-27 (1938). (French).
A report of 9 typical cases of benzene poisoning in a shoe factory, of which 4 were fatal. They were carefully examined and most of them were observed over a long period. In all cases a myelogram was made and the authors note its great aid in making a diagnosis. Even with an unfavorable general condition, the prognosis is favorable if the bone marrow findings are good. If, however, megacaryocytes and granulated elements are lacking in the marrow, and if one finds only very young elements in the red cells, the prognosis is poor.
- 844 LEAD POISONING IN THE COMMUNITY FROM THE STANDPOINT OF THE INDUSTRIAL WORKER. Irving Gray and Irving Greenfield. N.Y. State J. Med. 37, (December 1, 1937). Reprints obtainable from Dr. Gray, 41 Eastern Parkway, Brooklyn, N. Y.
Lead is encountered with great frequency in non-industrial life. It is present in practically all foods and fluids ingested, such as bread, fruits, vegetables, milk, eggs, drinking water, etc. The absorption of lead in the general civilian population and its possible relation to disease requires further investigation and study. The diagnosis of non-industrial lead poisoning is most frequent among children, very rare among adults. The authors report on 54 cases of acute industrial lead poisoning and 38 cases of chronic lead poisoning with symptoms and clinical pictures.
- 845 LEAD POISONING. SECTION I. EXPOSURES TO LEAD: ITS ABSORPTION, TRANSPORTATION, DISTRIBUTION AND DEPOSITION IN THE TISSUES. V.A. Gant. Ind. Med. 7, 606-22 (October 1938).
There are no symptoms pathognomonic of lead alone and diagnosis without chemical findings is extremely difficult or impossible. This paper describes lead poisoning and gives a very detailed description of the photometric dithizone method of determination, made specific for lead. All human tissues contain some lead, which is called the "normal" lead, and which remains fairly constant unless exposure is above normal. Analyses are given of the lead content of 25 individuals with no abnormal lead exposure.
- 846 EARLY DIAGNOSIS OF LEAD POISONING BY MEANS OF THE QUANTITATIVE DETERMINATION OF PORPHYRIN. M. Schafer. Arbeitsschutz. pp. 175-8 (1938). (German).
The author made blood tests and porphyrin determinations (with the analytic quartz lamp and the Zeiss stage photometer) of 25 workers in a white lead factory. Almost all showed the lead line and about half had lead coloring.

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Porphyrin was determined in the urine collected during the day. The author believes that the porphyrin tests brought to light some cases that were missed by other kinds of examination.

- 847 PRECISION METHODS IN THE DETERMINATION OF HEAVY METALS. L.T. Fairhall. Am. J. Pub. Health 28, 825-31 (July 1938).
The general problem of the determination of traces of toxic metals, especially in organic matter is discussed briefly by the leading American authority in this field. Various ashing methods are outlined and the dithionite and spectrographic methods are discussed, with emphasis on some of the less obvious sources of error. The necessity for greater care is emphasized and the author is more concerned with trying to prevent slipshod work than with criticizing specific analytical methods.
- 848 SHOULD RED LEAD PRIMING BE APPLIED BEFORE RIVETING? Walter Meyer. Farben-Ztg. 43, 809 (1938). (German).
The grave danger that riveters may contract lead poisoning when working with iron and steel primed with red lead could be avoided by using some other primer.
- 849 ETHYLENEOXIDE POISONING (CARBOX). E. Metz. rztl. Sachverstand-Ztg. 44, 155-7 (1938). (German).
A silo cell in a warehouse was gasified and then soon emptied. Near it worked a 19 year old boy who left his work after about 10 minutes because of a dullness in the head and a sweetish taste. He was taken to the hospital slightly stupefied, vomiting copiously and with an irritating cough. The electrocardiogram first showed right ventricular coupled extrasystoles; later there appeared brady-cardia and a low pulse so that a heart stimulant was given him. The next day he recovered, but after six weeks the work-electrocardiogram still showed a delayed recovery time.
- 850 MECHANICAL RESUSCITATION IN ADVANCED FORMS OF ASPHYXIA. A CLINICAL AND EXPERIMENTAL STUDY IN THE DIFFERENT METHODS OF RESUSCITATION. P.N. Coryllos. Surg. Gynecol. Obstet. 66, 698-722 (April 1938).
The author discusses the various causes of asphyxia and several methods of resuscitation. Of the latter, he considers the mouth-to-mouth the best, although it has drawbacks. In a prolonged application (6 hours) of 95% oxygen and 5% carbon dioxide, several of the dogs used in the experiments died, but on heating the gas mixtures, the animals lived. Much success was had with an E.&J. resuscitator and the experience with it on 12 patients is described.
- 851 SKIN ABSORPTION. A.L.L. Silver, Indust. Welfare 20, 229-30 (June 1938).
The ideal protection against skin absorption is by mechanical handling of suspected substances, but where this is not possible, protective clothing should be worn, and gloves should be worn or a skin protective used for the hands. The essential points about a skin protective are that (1) it should not contain any irritant or any chemical that will act as a solvent of the substance handled, (2) it must be pleasant in use and not cause discoloration, stickiness or stiffness of the skin and (3) if possible, it should be easily removable by simple washing with soap and water.
- 852 INDUSTRIAL SKIN DISEASE FROM OILS. C. Flandin, H. Rabeau, Mlle. Ukrainczyk. Bull. Soc. franc. de Derm. et Syphil. pp. 929-32 (1938). (French).
The authors write of the difficulty of differentiating clearly between industrial oils since almost all are mixtures and may be distillation products of differing degrees. They report three cases, in two of which oils were used, and, although the nature of the oils could not be determined exactly, there

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was a strong reaction in each case. Another case was caused by an oil cake consisting of peanut and cocoanut particles. Of 14 workers using this substance all but one, a negro, had skin diseases. The authors note the importance of personal cleanliness in working with oils of any kind.

- 853 TOXICOLOGY OF PHENYLDICHLORARSINE. II. RESPONSE OF MAN TO P D A-OIL MIXTURES. R.R. Sayers and H.C. Dudley. U.S. Pub. Health Repts. 53, 1292-1301 (1938). This is the second paper on phenyldichlorarsine, which as a 1% solution in medium and heavy petroleum distillates, is used as a wood preservative. The first article "Experiments with Animals" was abstracted in April, 1938 Bulletin, No. 312. In the later experiments on man, the reaction on skin contact seemed to vary with the individual; some show no reaction, others a delayed action. Impregnated wood free from surface oil caused no serious effects, and careful control of impregnating processes is necessary in order for the use of this substance as a preservative.
- 854 CITRUS FRUIT DERMATOSES. H. Beerman, G.H. Fonde and J.L. Callaway. Arch. Dermat. Syphil. 38, 225-34 (August 1938). The authors divide citrus fruit dermatoses into four groups: true allergies, reactions to mycotic or parasitic contaminants, reactions to dyes or preservatives, and pseudo-allergies. It is important that the type of disease be discovered. Oil from lemon peel seems to be the worst offender.
- 855 CEMENT ECZEMA. W. Burckhardt. Schweiz. med. Wchnschr. 68, 783 (1938). (German). This eczema develops primarily not from a definite allergic reaction but from a repeated toxic eczematoid erosion.
- 856 JACARANDA AS A CAUSE OF DERMATOSIS. M. Tottic. Acta dermatoveneoreologica 19, 235-45 (1938). (Scandinavian). The author reports on three table makers who fell ill of dermatosis caused by work with Jacaranda Envaco. Skin tests were positive in all three cases but were negative when other exotic woods were used, as well as with other kinds of Jacaranda (ebony).
- 857 INDUSTRIAL DERMATOSES DUE TO FUNGI. Louis Tulipan. Ind. Med. 7, 603-7 (October 1938). To decide the occupational origin of fungous diseases, the following must be considered: time of contracting disease, industrial conditions which could have caused the infection, and possible injury or trauma in the occupation which may have opened the skin to fungous infection. The author classifies the fungi and gives a technical discussion of the action of each type. Most industrial dermatosis cases from fungi are from handling animals, plants, fruits, and a few miscellaneous sources as silk, leather and wood.
- 858 VITAMINS AND CARCINOMA. T. Gordonoff and F. Ludwig. Z. Krebsforsch. 47, 421-6 (1938). (German). To determine the effect of vitamins on growth of tumors, tissue cultures were made of fibroblasts and carcinoma tissue and the amount of growth determined in a medium with varying vitamin content. It was concluded that the vitamins had no specific action on cancer and that the withdrawal or increased intake would have no practical value in the treatment of cancer.

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- 859 A DISTANCE RECORDER FOR FIREDAMP. H. Lloyd. Trans. Instn. Min. Engr. London 94 458-66 (March 1938). (British)..

It was required to construct a methane recorder safe for use underground, reasonably portable, able to operate unattended, with a range from zero to 3% of methane, with an error not greater than plus or minus 0.05%. A recorder based on the principles of diffusion and combustion had several disadvantages including a variable time-lag. The principle finally adopted was the straightforward mechanization of a common method of gas-analysis, as carried out manually, for example, in the Haldane apparatus. The working of the various models of the apparatus is fully described. The instruments may be used for remote recording and for the control of alarms.

- 860 TOXIC GOITRE AND ITS EFFECT ON INDUSTRY. N.W. Gillette. Virginia Med. Monthly 65, 494-7 (August 1937).

Toxic goitre is most common in the Great Lakes region. It has not been entirely eliminated in Toledo School children by the use of iodized salt. It is more common in women and in one factory, at least 1 woman in 10 is suffering from it. From an industrial standpoint, toxic goitre should be considered because it increases fatigue when an advancing stage and the author urges that industrial physicians give more attention to the thyroid in examining applicants.

- 861 INDUSTRIAL EYE INJURIES. J. Minton. Indust. Welfare 20, 265-71 (July 1938). (British).

Of the 12,000 casualties treated at the Royal Eye Hospital in 1936, 7,000 represented industrial eye injuries. Of the industrial cases, 80% came from the engineering and metal trades, and 50% were injured while grinding. Most injuries were caused by corneal foreign bodies; corneal abrasions and chemical injuries being the next common causes. It is estimated that 10% of the blindness in Great Britain is from an industrial origin.

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Mr. Brown

Note to Members: Following is a news-bulletin briefly summarizing some "highlights" of the third annual fall meeting of Air Hygiene Foundation. Complete Proceedings will be published shortly.

Employee Health Work Progressing

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 X-ray methods for large scale medical examinations of industrial workers; The Sarnac (N.Y.) Laboratory for studies of "mixed" dusts and "protector" dusts in combating dust diseases; Harvard University for two graduate fellowships for special 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. A few "highlights" from the various reports and addresses follow:

Dr. Willard E. Hotchkiss, Maurice Falk Professor of Social Relations, Carnegie Institute of Technology and former President of Armour Institute:

"A competent authority finds that an estimated 200 million working days are lost annually on account of illness and it is calculated that this runs into hundreds of millions of dollars. The question arises, 'What does this cost?' There are about 15 million people in the heavy industries in this country. If you assume there are four dependents for each industrial employee you will get 60 million people that are effected when a day's work is lost by illness x x x x. The only question about the future of a problem like this is whether it is going to be handled sanely and constructively, and in a consecutive way based on science, or whether it is going to be handled emotionally and restrictedly and unintelligently."

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Prof. Philip Drinker of Harvard, Chairman of the Foundation's Preventive Engineering Committee:

"Two graduate fellowships have been established by Air Hygiene Foundation at Harvard University to train men in industrial hygiene. This will help build up a skilled personnel to meet increasing demands from industry and government for industrial hygienists. One candidate will study fundamentals of hood design for control of gases, vapors, etc. The other fellowship will study the identification and distribution of dusts in tissue.

"New solvents which were laboratory curiosities a few years ago are now sold in carboy and tank lots. This development brings new problems to the industrial hygienist. During 1938 the Preventive Engineering Committee issued seven bulletins covering practical measures for combating industrial health problems. x x x x The question of, 'What is the best apparatus and method for dust determination?' is still about where it was a year ago. x x x x The Bureau of Mines has described a midget impinger which is run at a few liters of air per minute, instead of one cubic foot (28.3) liters. This equipment, light and hand operable, may gradually replace the large impinger x x x x. The various grab samplers are useful, particularly for routine control. x x x x There is great need for a critical survey of design and operation of existing exhaust systems in industry."

T. F. Hatch, New York State Division of Industrial Hygiene, member of the Preventive Engineering Committee:

"Code requirements of a state never quite catch up with the standards established in the best industrial establishments. It is estimated that less than 10% of the progress in accident prevention in industry can be credited to mechanical contrivances such as you would put in a code, and that better than 90% is the result of intelligent management. It is the same story here." (Mr. Hatch listed six "fundamental principles" required for a successful code.)

Dr. Leroy U. Gardner, Director, The Saranac (N.Y.) Laboratory reported findings in a study of "mixed" dusts and "protector" dusts which he is conducting under a grant from the Foundation. His investigations show that the mixing of certain inert dust with quartz seems to retard incidence to silicosis. He said:

"The data suggest that analysis of the rock being worked does not necessarily constitute a measure of the silica hazard in a particular industry. When more evidence has been analyzed it may be found practical to use the proportion of silica in the atmosphere as the basis of state codes. It is hoped that the modifying influences of other dusts may also be established upon a practical basis. x x x x The principles involved in these studies probably explain the variations in the rate of development of silicosis in different industries. Ultimately they may make it possible to neutralize the effects of silica upon the body. At the present time the influence is not sufficiently understood to be used in this manner. In the speaker's opinion the major objective in the campaign against silicosis is still the elimination of silica dust from the working atmosphere."

Dr. S. Reid Warren, Jr., of University of Pennsylvania, reported on research on X-ray which is being supported by the Foundation and which seeks to improve the X-ray technique for industrial purposes, as in the case of large-scale medical examinations of groups of workmen. He and his associates experimented in taking X-ray pictures on paper, much cheaper than film. They showed their results to 35 of the country's leading roentgenologists. It was concluded that the more economical paper

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pictures are adequate under certain circumstances. This work will "prepare the groundwork for a standardization of roentgenographic procedure in industry."

V. P. Ahearn, Executive Secretary, National Industrial Sand Association:

"Attention has been focussed on the need of steady employment at higher wages, but the Government generally has recently manifested a much larger interest -- that of public health. x x x x A steady job, decent hours with good pay, is no longer the sole criterion. To that must be added industrial health. x x x x It is often characteristic of Government that when it swings with the pendulum, it swings too far and thus aggravates rather than cures. x x x x This question of industrial health is not the single problem of a single industry. Neither is it an emotional nor a sentimental problem. It is a practical problem for industry as a whole to solve. Statutes of themselves will not provide industrial health. As in the case of industrial accidents, industry has always shown a capacity, once it recognizes and confronts a problem realistically, to make steady progress toward its solution. Air Hygiene Foundation presents a useful vehicle through which industry can pool its forces in eliminating or controlling hazards to health in industry. The necessary work can be done more effectively, it seems to me, and more economically through the Foundation, and the work of the Foundation will be more favorably received than in any other way. x x x x Management x x x x must hereafter be interpreted in terms of x x x x providing an increased well-being for the ordinary wage-earner and his family; An inescapable part of this is health in industry. In this undertaking there must be a mutual spirit of tolerance."

Theodore C. Waters, Chairman, Maryland Occupational Diseases Commission and member of the Foundation's Legal Committee:

"Twenty-one States have laws compensating disabilities arising from occupational diseases. As we look forward to the 40 odd legislative sessions of 1939, there will undoubtedly be additional States enacting laws providing some form of compensation. The laws already enacted have given rise to various controversial questions affecting the relationship of employers and employees. x x x x Since disabilities caused by those diseases called 'occupational' are far less numerous than those caused by the other common ills of life, it is a matter of concern to industrialists today that occupational disease laws should not be administered as general health insurance laws, to provide compensation for time lost by employees due to common ills. x x x x It is regrettable that occupational disease legislation has not been more uniform, although future amendments may tend toward uniformity x x x x. When we analyze the provisions of the law of one State providing compensation for one specific disease and compare these provisions with the law of an adjoining State, we realize that this legislation is still in its infancy and subject to drastic revision. It is too early to predict whether or not the administration of the laws presently enacted will be successful, but if they fail, they should fail because of their inherent defects and inequalities, and not because of the attempt by employers to avoid x x x x costs for compensating injuries resulting from operations to which their employees have been subjected."

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