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Mr. Dean Swartz

January 19, 1999

I have reviewed the Industrial Hygiene Digest issues I have for the following months during the period that GATX was a member of the Air Hygiene Foundation (as it was called until 1941): 10 and 12, 1937; 1-3, 5-6, 9-12, 1938; and 1, 1939. There were many abstracts on dust sampling and dust control engineering, but I have only copied those that specifically mention asbestos. There was also one that referred to dust control work apparently reported by GATX, on the use of covered hopper cars to permit dust suppression by companies using railcars full of powdered arsenic or silica, etc. (cover page, Jan. 1938). Two hours of my bill is for examining these documents; I think the other 4 issues in this time period are available at the National Library of Medicine, which you may wish to examine if you want to see what they contain.

File thru 1943

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Air Hygiene Foundation of America, Inc.,
4400 Fifth Ave., Pittsburgh, Pa.,
December 10, 1937

REFERENCES TO RECENT LITERATURE ON INDUSTRIAL DISEASES

(A) News Items.

- 589 MICHIGAN SYMPOSIUM. Ind. Med. 6, 562 (Oct., 1937).
An Occupational Disease Symposium under the auspices of the Department of Labor and Industry of the State of Michigan was held at Detroit on Oct. 21 and 22. Several papers were presented and will be abstracted as they appear.
- 590 OCCUPATIONAL DISEASE SYMPOSIUM. Ind. Med. 6, 550-3 (Oct., 1937).
A symposium on industrial diseases was held at Northwestern University on Sept. 27 and 28. Papers on silicosis, allergy, industrial solvents and general industrial health were presented and will be abstracted as they appear.
- 591 A PLAN FOR INSTRUCTION IN INDUSTRIAL HYGIENE. Ind. Med. 6, 566-71 (Oct., 1937).
Rapid developments in industrial hygiene throughout the country have demonstrated that the weakest link in plans for coping with occupational disease, plant sanitation, and occupational disease legislation, is the inadequate training of physicians and engineers in those subjects. Instruction has been developed by the Bureau of Industrial Hygiene, Department of Health of Detroit. Didactic and laboratory work, degrees will be given by the schools sending their students, but the associated laboratory practice for a unit of 3 months, or longer, will be provided by the Bureau. The above Bureau, directed by Dr. McCord, will furnish details to interested persons or institutions.
- 592 FIGHTING DUST HAZARD BY GENERAL ELECTRIC. Ceram. Age 29, 384 (Nov., 1937).
The General Electric Co. is now engaged in an extensive program for eliminating dust in its porcelain plant. Approximately \$35,000 has been spent on new equipment and some old equipment has been discarded or replaced. The equipment is of the water-wash type and has proved highly successful. Dust counts show very encouraging results and are still being made, with the receptacle directly in the breathing zone of the workmen.
- 593 EXHIBIT AT 1937 STATE FAIR. Ind. Bull. (Sept., 1937).
The New York State Department of Labor sponsored an industrial hygiene exhibit at the State Fair in September, built around the central theme of "a program for the prevention of dust diseases in industry." A large painting entitled "silicosis" was surrounded with cards containing information about the various silica industries and pictures of lungs showing silicosis, fibrosis and tuberculosis. Following were pictures of efficient and practical exhaust systems for use in typical dusty industries. Wax models of hands showing dermatoses of various types were displayed, and dust and gas detectors were also shown. The exhibit is also being shown at schools, conventions and other meetings.
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- 611 LAW OF SIZE DISTRIBUTION AND STATISTICAL DESCRIPTION OF PARTICULATE MATERIALS. P.S. Roller. J. Franklin Inst. 223, 609-33 (1937).
This is a mathematical treatment of the results obtained with air separator described in our abstract No. 362. A law of size distribution has been discovered which relates the weight percentage and from this the frequency, to size of particle. The author deals with finely divided clays, litharge, silica, cement, lime, feldspar, talc, and the like as used in the ceramic industry. It seems probable that the method can be applied to hygienic problems.
- 612 IMPROVED METHOD FOR DETERMINING NASAL FILTRATION OF DUST. G. LEHMANN. Arbeitsphysiol. 9, 569-71 (1937). (German.)
Time is saved by the use of a photometric method instead of the konimeter, for counting dust particles. The Zeiss Pulfrich photometer and a special stage are employed. The apparatus must be calibrated for each kind of dust.
- 613 THE SIGNIFICANCE OF NASAL DUST FILTRATION IN ASBESTOSIS. G. Lehmann. Arbeitsphysiol. 9, 572-3 (1937). (German.)
The author determined the nasal filtering efficiency of 73 workers in an asbestos plant. Most of the employees had not worked long, and only 1 medium to severe case of asbestosis was found, with 17 light and 24 incipient cases. He concludes that nasal filtering efficiency is as significant in asbestosis as it is in silicosis.
- 614 PATHOLOGICAL AND ANATOMICAL QUESTIONS IN CASES OF PNEUMOCONIOSIS: SEVERE ASBESTOSIS. W. di Biasi. Med. Welt 11, 1234-7 (1937). (German.)
The author gives a clear discussion of pathological and anatomical changes in the development of pneumoconiosis (silicosis) and emphasizes the fact that no real pneumoconiotic changes have been seen without exposure to quartz. In hundreds of cases in the Ruhr district, he has never seen connective tissue growth in lungs completely blackened by coal dust unless rock dust was also present. Claims to the contrary have not been confirmed by autopsy findings. In asbestosis, the growth of diffuse connective tissue is greater in the lower part of the lung than in the upper. The author attributes this growth to the mechanical action of asbestos.
- 615 DUST CONTENT OF AN ASBESTOSIS LUNG AND THE NATURE OF ASBESTOSIS BODIES. N. Sundius and A. Bygden. Arch.f. Gewerbepathol. u. Gewerbehyg. 8, 26-70 (1937) (German.)
This long paper reports careful chemical experiments on the asbestos in the lung and asbestosis bodies. Although much more serpentine asbestos than hornblende is used in industry, the latter was found exclusively in the lungs examined. The asbestosis body sheaths are formed not only around asbestos but also around similar crystals of other substances. No support has been found for the belief that asbestos causes a chemical decomposition in the lung. The gel substance of the sheath consists of iron oxide, phosphoric acid and a protein. This gel substance originates entirely from the body fluids and since the iron content is high (40% as oxide), the most plausible suggestion is the blood. The cause of the sheath formation is not related to the chemical nature but to the rigid and sharp needle form. The authors believe that the fibrosis can also be attributed to this.

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 Air Hygiene Foundation of America, Inc.,
 4400 Fifth Avenue,
 Pittsburgh, Pa.,
 January 10, 1938

REFERENCES TO RECENT LITERATURE ON INDUSTRIAL DISEASES

(A) News Items

- 1 **GOOD HOUSEKEEPING AND SAFETY IN FOUNDRIES AND INDUSTRIAL CODES AND OCCUPATIONAL DISEASE LEGISLATION.** Reprint No. 37-30, American Foundrymen's Assoc., Inc., Chicago, (1937). 61 pp. price \$1.50
 This booklet consists of papers presented at the last meeting of the association. Among the subjects treated are eye and respiratory protection in the foundry, silicosis, good housekeeping in the foundry, industrial codes and their applications, and occupational disease legislation. Abstracts of these papers will appear in a future bulletin.
- 2 **COVERED HOPPER CAR FOR GRAVITY UNLOADING.** The following note was sent to us with the statement that it might be of interest to the members of the Foundation. "The dust problem in loading and unloading raw materials shipped by rail in bulk has long been known as a serious hazard. In most instances fine granular products have been pulled out of a box car by means of a power shovel operated by one or more men within the dust filled car. Not only is the car itself loaded with dust, but pulling the commodity into a chute at the edge of the box car allows a good percentage of the material to be blown into other near parts of the plant. This problem has become so acute in industries using silica sand, powdered arsenic, burned lime and other hazardous commodities that the General American Transportation Corporation, 135 South LaSalle Street, Chicago, have developed, built and leased to shippers or consignees, a covered hopper car that will unload dry granular products by gravity. An inexpensive track hopper is usually used in conjunction with the car and a boot between the hopper and the car makes the unloading operation both dust proof and economical."

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

- 3 **DUST HAZARD AMONG FOUNDRYMEN.** L. H. Osmond. Am. J. Roentgenol. and Rad. Therapy 38, 122-8 (July, 1937). (See note on final page.)
 The author reports roentgenological and clinical surveys of the foundry employees of a large plant in Pittsburgh. All workers undergo an annual physical examination, and careful histories are taken showing the location of each man's work since he entered the company's service. Dust counts are available for each location. They range from 13.1 million particles per cubic foot in the molding room to 44.9 million in the coromaking department, but a count of 240 million was obtained during the night shakeout. Chemical analysis of the dust showed 52% free silica and 10.3% calcium and magnesium silicates. The incidence of simple silicosis in the entire group, including many who had worked less than 5 years was 5.5%. In those with over 20 years' experience, silicotic fibrosis was found in 44%, including 32% without infection and 12% with infection. The disability of those without infection was practically nil, while it was frequent in those who had complicating infection. Little correlation between incidence and dust concentration was observed. The death rate among all these workers was 517 per

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- 11 PNEUMOCONIOSES OF THE WORKER. K. Wider. Ztschr. f. Gewerbehyg. u. Unfall, 44, 131-5 (1937).
Silicosis became compensable in Austria on April 1, 1935. Since then, 206 cases have been reported in the Workmen's Compensation Office; of these, 171 are miners, some from lignite mines. In the metal industry, most cases are among sandstone grinders and sandblasters.
- 12 PULMONARY ASBESTOSIS. IV. THE ASBESTOS BODY AND SIMILAR OBJECTS IN THE LUNG. Kenneth M. Lynch, M.D., Dept. of Pathology, Medical College of the State of South Carolina, Charleston, S. Carolina. J.A.M.A. 109, 674-8 (Dec. 11, 1937). Reprints probably obtainable from author.
The typical asbestos body (also called asbestos body) is an object 10 to over 100 microns^{long} and 1 to 12 microns thick and is composed of a central translucent fiber or needle crystal of asbestos with an enveloping shiny golden or brownish gelatinous substance constructing various architectural figures. Sometimes it is beaded or clubbed and sometimes spherical. A Prussian blue reaction for iron is given. These bodies may be found at various places in the lung, especially in the bronchioles, the alveoli and in the tissues along the lymphatic route; usually shorter at a distance from the alveoli, but often surprisingly long, considering the distance they have traveled. They sometimes cause fibrosis around them, but not necessarily. They are also found in the sputum of those exposed to asbestos dust, but their presence or absence in the sputum does not indicate the presence or absence of asbestosis; their presence only shows that exposure to the dust has occurred. Similar bodies have been found in persons exposed to coal dust, and in others who have died of heart failure, rheumatism and arteriosclerosis, without known heavy dust exposure. Exposure to asbestos dust does not always produce asbestos bodies; bare fibers have been found in the lungs of animals. The author has seen silica particles similarly enveloped, in cases of silicosis, not always so highly colored. It is suggested that other fibrous or crystalline dusts not yet studied may form similar bodies.
- 13 BLOOD EXAMINATIONS IN PULMONARY FIBROSIS OF HEMATITE IRON ORE MINERS. J. Craw. Tubercle, 19, 8-18 (October 1937).
In radiographic examinations of hematite miners in West Cumberland (England), the hematite accumulations show a definite and dense shadow, apart from any accompanying fibrosis, and there is a tendency to diagnose silicosis when a miner complains of unfitness and his pulmonary symptoms and the x-ray of the test show generalized nodulation. The silica content of inhaled dust, however, is low, and in spite of 20 to 30 years' work and general nodulation in all lung fields, the miners are perfectly fit for work and are not short of breath. For these reasons hematological work was instituted as an essential in diagnosis. Routine procedure included the following determinations: (1) sedimentation rate of the red cells; (2) total white cell count; (3) differential white cell count, and (4) the polymorphonuclear count of von Bonsdorff. The findings in 6 cases are given, with case histories. Of the 50 hematite miners studied, 20 normal miners had no complaint of breathlessness and no x-ray or physical signs of pulmonary fibrosis, while 30 complained of pulmonary disability in varying degrees, with positive x-ray findings. Many miners develop a pure pulmonary siderosis without accompanying fibrosis, and their blood picture is normal. Sidero-silicosis of uncomplicated type shows a definite increase in percentage of lymphocytes, and the ratio of polymorphonuclear cells to lymphocytes becomes 1 or less. The sedimentation rate and nuclear count are normal. When infection is present, the sedimentation rate increases, the nuclear count increases and there is a leucocytosis which may approach a septic count. Although the results are preliminary, the method is recommended for aiding the differential diagnosis of siderosis without fibrosis and of sidero-silicosis, and for detecting tuberculosis or other infective agents at an early stage.

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1. News Items

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References to Recent Literature - 2

- 101 PREPARING STATE INFORMATION FOR WORKERS. Survey of Labor Law Admin. 8 (Dec. 1937)
The New York State Department of Labor has just issued a 32 page, vest pocket booklet concerning the State Unemployment Insurance Law, entitled "Information for Employees." It explains the procedures for filing applications for laws and for unemployment insurance benefits. To meet the public demand, 5 million copies are being printed.
- 102 OCCUPATIONAL DISEASE COMPENSATION. Pittsburgh Med. Bull. 27, 71 (Jan. 22, 1938)
and other sources.
A new occupational disease compensation law went into effect January 1 in Pennsylvania, the 21st State to adopt such legislation. The causes of compensable industrial disease are specifically listed. They include: poisoning from lead, mercury, arsenic, manganese, phosphorus, methanol, carbon bisulfide, hydrocarbon distillates, halogenated hydrocarbons, benzol and its nitro, amido or amino derivatives, radium, x-ray, chromic acid and its salts; infection from tar, pitch, bitumen, mineral oil, paraffin, oils, cutting compounds, lubricants, dust, liquids, fumes, gases, vapor and anthrax; and injury from asbestosis, silicosis or anthracosis (miner's asthma) and caisson disease (compressed air illness). Silicosis, anthracosis-silicosis and asbestosis are not compensable for temporary or partial disability; employers' liability may not exceed \$3,600 in any one case. These limitations do not apply to the other industrial diseases named. The cost will bear more heavily on the industries having the greatest industrial disease hazards.
A recent survey of industrial disease hazards in Pennsylvania, tabulated and analyzed by a WPA project, involving a field survey of 16,000 industrial establishments, indicates that the total number of employees exposed to industrial disease hazards was 672,010, of which 445,671 will be covered by the new law.
Copies of the Occupational Disease Compensation Law are obtainable from the Department of Labor and Industry at Harrisburg.
- 103 TRAINING PENNSYLVANIA FACTORY INSPECTORS. Survey of Labor Law Admin. 3, (Dec. '38)
Certificates were recently awarded to 90 Pennsylvania State factory inspectors who had completed the training offered in three separate, 2 weeks' safety and health training courses. These 3 courses were organized by the Pennsylvania Department of Labor and Industry in cooperation with the University of Pennsylvania, University of Pittsburgh and Pennsylvania State College, assisted by members of the safety and health staff of the Division of Labor Standards. The schools supplied instruction and classroom and study facilities. The practical lectures on safety and health subjects were supplemented by inspection trips to a variety of industrial plants with satisfactory and with unsatisfactory conditions. These trips were followed by classroom discussion of the hazards observed, with proposed and accomplished methods for their correction. Daily examinations and a final 3 hour examination were given. Plans for continued training are being made, and special courses in safety promotion and safety organization are being considered for inspectors who have indicated ability for advanced work. Addressing the candidates for certificates, Secretary of Labor Perkins forecast a new type of factory inspector who, through training, study and practical service, would elevate his profession to a high plane.
- 104 DRAFTING RULES FOR DUST AND FUME CONTROL. Survey of Labor Law Admin., 2 (Dec. 1938)
A committee has been appointed to assist the Massachusetts Department of Labor and Industry in the preparation of rules and regulations for the control of hazardous dusts and fumes in the manufacturing establishments of the State. This effort toward industrial dust control is a sequel to the investigation of the Massachusetts Industrial Disease Commission of 1933-34 and to the findings of the granite dust control project, conducted during 1935 and 1936 by the Department's Division of Occupational Hygiene.

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Air Hygiene Foundation of America, Inc.,
4100 Fifth Avenue,
Pittsburgh, Pa.
March 10, 1938

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REFERENCE TO RECENT LITERATURE ON INDUSTRIAL DISEASES

(A) NEWS ITEMS

184. **MID EAST CONFERENCE.** Ind. Med. 7, 3 (Jan. 1938)
The Midwest Conference on Occupational Diseases will be held in Chicago in June of this year, in conjunction with the 47th Annual Meeting of the American Association of Industrial Physicians and Surgeons. For the first time in the history of the Association, its convention will feature scientific and commercial exhibits.
185. **INDUSTRIAL HEALTH COUNCIL. FIRST MEETING.** Ind. Med. 7, 90-2 (Feb. 1938).
The Industrial Health Council has been formed by the American Medical Association for the study of occupational diseases from the medical standpoint. Its first meeting was held in Chicago on December 10. Several phases of occupational hygiene were discussed, with reference to the scope of the program, and it is realized that the organization has a great task and a long program before it. Another meeting was planned for February.
186. **SILICOSIS FILM.** Surv. Labor Law Admin., 8 (Jan. 1938), also notice from U.S. Dept. of Labor.
The U.S. Department of Labor will shortly release a motion picture on the harmful effects of silicosis and the methods of prevention, to enlist workers, employers and the general public in the battle against this industrial disease. The narrator presents the history and importance of the disease. The film then describes where silica dust originates and how workers are exposed. An animated cross-section of the upper half of the human lung shows how dust particles enter and are carried to the terminal air spaces, and how breathing is impeded when lungs are clogged. Scenes in dusty plants without proper safeguards are contrasted with others where adequate dust control methods are used. Preventive measures, including safeguards and adequate State legislation, are described. Exhibit copies of the film will be available to interested organizations late in March. Requests for booking should be made to the Division of Labor Standards, U.S. Department of Labor, Washington, D.C.
187. **I.L.O. Study of WORKMEN'S COMPENSATION FOR SILICOSIS.** Reviewed in Surv. Labor Law Admin., 10 (Jan. 1938). The original publication is issued as International Labor Office Study - Series F (Industrial Hygiene) No. 16 and is obtainable from the American Headquarters of International Labor Office, 734 Jackson Place, Washington, D.C. Price not given.
This study presents three typical systems of compensation for silicosis - through special legislation in South Africa, through special schemes in Great Britain, and through special coverage in Germany. The application of blanket coverage to silicosis is considered in an appendix. Details of each plan are discussed. Prevention is stressed in the laws of each country.

B.I. Castleman 08



November 1932

STANDARD

References to Recent Literature - 7

the effects of varying air conditions is receiving the greatest amount of attention. The alkalinity, acidity and toxicity of mine atmospheres is being studied. In connection with drilling operations and blasting, no basis is found for a general statement fixing permissible amounts of dustiness. Extensive use of water is considered good practice in dealing with the dusting from blasting. The wearing of respirators is common, as well as the use of water blasts. With regard to ventilation, the use of auxiliary fans and piping, heavier pipe and flexible lines is growing. The Ontario act requires annual x-ray examinations, and tuberculosis is considered the most serious factor in silicotic conditions. Tubercular employees are not allowed to work underground. A distressing incidence in silicosis is suggested by the number of new cases during the past 5 years, but the period of exposure necessary for development of the disease has lengthened from 10 to 18 years. Special emphasis is laid upon the value of measures to counteract tuberculosis. (From abstr. in Colliery Guardian, Jan. 14, 1938. p. 75).

- 204 SOME PHYSICAL ASPECTS OF THE SILICOSIS PROBLEM. A.J.Lanza. Am. Inst. Min. Met. Engrs., Tech. Publ. No. 856 (Nov. 1937). Reprints probably obtainable from Dr. Lanza, Metropolitan Insurance Co., New York City. This is a brief but pointed review of the present state of silicosis prevention. One point emphasized is that authorities most in touch with the problem in this country believe that there is little appreciable disability connected with silicosis in the absence of infection, and that tubercular infection in silicosis is the crux of the compensation problem. When silicosis came to the front in the U.S., it did so on the crest of a wave of litigation never paralleled in medico-legal annals, and legislation has been enacted in the midst of the furor aroused. It is greatly to the credit of the various legislative bodies that they dealt with the problem as well as they did. The difficulty with silicosis is essentially its chronic nature, and the problem of compensation for previously existing or developing silicosis has been met in various ways by different states, and it remains to be seen how they work out. In the mining industry, much has been accomplished in silicosis prevention in the absence of specific codes or regulations. Safe concentrations have not been absolutely determined, but there is evidence that a concentration of more than 5 million particles per cubic foot of highly siliceous dust is dangerous. Anthracite dust, containing less than 5% free silica, has been found not to cause disabling silicosis (anthracosis) in concentrations of less than 50 million particles per cubic foot. Some progress is being made in establishing tentative standards in the mining industry, and more should be done in that line by mining companies with the cooperation of governmental authorities. The effect of other dusts in modifying the action of silica should be further studied. Intelligent handling of the medical control problem, especially in dealing with silicotics who are not disabled, is stressed.
- 205 A STUDY OF DUST CONTROL METHODS IN AN ASBESTOS FABRICATING PLANT. Richard T. Page and J.J.Sloomfield. U.S.Pub. Health Repts. 52, 1713-27 (Nov. 26, 1937) Obtainable from Supt. of Documents, Washington, D.C., for 5 cents, cash. This paper presents a detailed study of the dust control methods used in an asbestos fabricating plant, and supplements an extensive medical and engineering study of the health of asbestos workers, as yet unpublished. The plant studied has partly completed an extensive dust control program, and the results are not to be interpreted as representing the maximum possible efficiency in asbestos dust control, but simply indicate actual conditions which are probably representative of the best practice in this country at this time. The entire process is described, with the dust control systems in use with the various processes in each department. An occupational analysis of

employees is presented, with a comparison of the atmospheric dust concentrations associated with controlled and similar uncontrolled processes. Impinger counts ranged from 0.3 to 11.0 million particles per cubic foot when they were stopped. Adequate data have not been presented to justify the determination of threshold limits of dustiness that will produce asbestosis in any definite period of time, and therefore it is impossible to determine permissible limits of dustiness on a medical basis. Nevertheless, any appreciable decrease in asbestos dust will decrease the incidence and severity of the resulting asbestosis. Since total elimination of dust is impracticable, actual conditions resulting from application of practical dust control methods can be used as temporary standards by that industry.

- 206 INDUSTRIAL EXHAUST VENTILATION. EXHAUST HOOD ENTRY COEFFICIENTS. John L. Alden. *Heat. & Vent.* 35, 47-50 (Feb. 1938).

This paper continues the author's series on industrial exhaust ventilation. The technical treatment of rate of air flow in entries, contraction, entry coefficients, etc., begun in the December paper, is continued. Diagrams of hoods of different types are given with the appropriate entry coefficient, entry loss and nearest simple orifice. The methods of increasing flow through hoods are discussed.

(We have had several inquiries regarding the original papers. Our latest information is that they will continue for 6 or 7 months more, and that the combined papers, with additions, may be published in book form if the publishers feel justified as a commercial venture. Otherwise the papers are obtainable only by purchasing or subscribing to *Heating and Ventilating*, published by The Industrial Press, 148 Lafayette St., New York City.)

- 207 EXHAUST REQUIREMENTS FOR FOUNDRY DUST CONTROL. John M. Kane. *Foundry* 66, 31, 72, 74 (Feb. 1938).

Exhaust requirements for tumbling mills, blast-cleaning apparatus and grinding wheels are discussed, in continuation of the previous paper, with tables.

- 208 DUST COLLECTION. H.R.M. Davies. *J. Inst. Heating Vent. Engrs. (British)* 5, 317-36 (1937).

A general description of dust-collecting methods, including exhaust systems and dust separators.

GOOD HOUSEKEEPING AND SAFETY IN THE FOUNDRY, INDUSTRIAL CODES AND OCCUPATIONAL DISEASE LEGISLATION. Reprint No. 37-30, American Foundrymen's Association, 222 W. Adams St., Chicago, Ill. Obtainable at that address, price \$1.50. The papers presented at the Annual Meeting of the A.F.A., Milwaukee, May 5 and 6, 1937 are included in this reprint and are not obtainable separately. Abstracts of the papers follow.

- 209 FOOT AND LEG PROTECTION IN THE FOUNDRY. M. Walter Dundore. A.F.A. Reprint No. 37-30, 9-14 (1937). Obtainable as above.

The paper discusses the need of protection for feet and legs in the foundry, the need of comfort as well as safety, and standards that are expected in the manufacture of safety footwear.

- 210 THE USE OF EYE AND RESPIRATORY PROTECTION IN THE FOUNDRY INDUSTRY. John H. Holzbog. A.F.A. Reprint 37-30, 15-23 (1937). Obtainable as above.

Goggles and respirators are discussed. The fundamental points to be kept in mind in selecting either equipment are protection, comfort, durability and cost. Goggles are available for all types of work and the needs for the particular operation must be considered. The cup type offers the most complete

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

(A) News Items

- 338 PROGRESS OF STATE MINIMUM-WAGE LEGISLATION, 1937. L. Stitt and F. P. Smith. U.S. Monthly Lab. Rev. 46, 194-204 (Jan. 1938).
Following the Supreme Court decision upholding the constitutionality of the Minimum Wage Act of Washington, great expansion in legislation setting standards of minimum wages and maximum hours for women and minors has occurred. At the end of 1937, Minimum Wage Acts were in force in 22 states, the District of Columbia and Puerto Rico.
- 339 PROTECTION OF WORKERS IN SANDBLASTING. Arbeitsschutz, 48 (1938). German.
This short account of a meeting of the sandblasting committee of the German Society for work protection includes reports on the use of sand, steel shot and grit, dust-free working methods and suggestions for the solutions of various problems.
- 340 LABOR STANDARDS. New publication.
The Survey of Labor Law Administration, published for some time in mimeographed form by the U.S. Department of Labor, Division of Labor Standards, has been superseded by "Labor Standards" in a neat printed form. It contains sections entitled: Promoting Labor Standards, Safety and Health, State Labor Law Administration, Conferences and Conventions, and Of General Interest, with news items under each, of interest alike to employer and employee. It is issued monthly at 75 cents per year or 10 cents per copy and can be obtained from the Superintendent of Documents, Washington, D. C.
- 341 REGIONAL SAFETY CONFERENCES. Safety Eng. 75, 12 (April 1938).
Among the state safety conferences in the near future, the following are announced: Fourth Annual Virginia State-Wide Safety Conference, at Norfolk, June 3-4; Ninth North Carolina State-Wide Industrial Safety Conference, at Asheville, June 10-11; and the 1938 Western Safety Conference, at Los Angeles, Sept. 12-16.

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

- 342 DUST SAMPLING WITH THE BUREAU OF MINES MIDGET IMPINGER, USING A NEW HAND-OPERATED PUMP. J. B. Littlefield and H. H. Schrenk. U.S. Bur. Mines, Rept. Invest. 3387 (Mar. 1938). Obtainable from Division of Information, U.S. Bureau of Mines, Washington, D. C. No charge.
The midget impinger described in our February bulletin, abstract #108, can be used with a hand-operated pump, described in the present Report. The pump consists of 4 cylinders with pistons and valves, 2 surge tanks and a gauge. The outfit is carried in a case with 9 impingers, and in operation the closed case is held by straps passing over the operator's shoulder, with a rubber tube leading from the case to the impinger. A flow of 0.1 cubic foot per minute is obtained with a vacuum of 12 inches of water. Good agreement was obtained in a number of comparisons of the regular and midget impingers, in a wide range of

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- 357 PULVERIZING SILICA SAND. D.M. Wilhelm. Rock Prod. 41, 47-5 (April 1938). This is a brief illustrated description of the plant of the Milwood Sand Co. at Zanesville, Ohio. The dust hazard has been practically eliminated by the use of dust seals on all equipment in which dust is generated.
- 358 SOLVING THE DUST PROBLEM. F.W. Ortman, Jr. Safety Eng. 75, 13-6 (April 1938). Information obtainable from the author, Personnel Manager, Koppers Company, Baltimore, Md. The author briefly describes the dust control methods used in the grinding, milling and boring department of the Koppers Company at Baltimore. The original equipment, consisting of a number of installations was replaced by a central dust collection system, which has proved satisfactory for 13 years, with improvements that have been added more recently. The area of the screen has been increased one-third by the adoption of an improved type of screen, without increasing the size of the screen house. As an auxiliary measure, a large portable vacuum cleaner, with interchangeable nozzles, is used for cleaning walls and ceilings.
- 359 THE BEARING ON SILICOSIS QUESTIONS OF THE THIRD LAW FOR EXTENSION OF ACCIDENT INSURANCE TO INDUSTRIAL DISEASES. Lochtkemper. Zbl. f. Gewerbehyg. 15, 9-12 (1938). German. The author discusses the present German law, which puts all forms of silicosis on a par with accidents, and, like many of our new State laws, paves the way for proper preventive measures. He also reports on some of his own experiences, including cases of silicosis in chamotte workers and in clay tube factories. One case was that of a man who, for a year, had shoveled grain mixed with sand, and another was severe silicosis in a worker employed in a room near a sand-blast. The author cautions against exaggerating apparently alarming symptoms, such as old calcareous foci; on the other hand, a careful history is essential and special attention should be given to light forms of silicosis contracted in earlier work.
- 360 ASBESTOSIS AND ITS PREVENTION. T. Windel. Arbeitsschutz, 26-32 (1938) German. In continuation of the author's earlier work (abstract 271, May, 1937), he first presents more material on asbestosis in the textile industry. There are now about 1300 asbestos workers in Germany, and about 1000 are considered to be dangerously exposed, including weavers. Up to March 31, 1937, 27 cases of asbestosis, of which 16 were fatal, were reported. In 6 months of operation of the new compensation law, 10 cases have been identified. The earliest observed symptoms of the disease are seen after 3 or 4 years' work. An X-ray examination of each new employee should be made, and another after 3 years and at regular intervals. Above all, observers must prove whether or not a light case will inevitably progress in spite of removal from exposure. Obsolete and new protective measures are contrasted, with illustrations, and the necessary technical improvements are described.
- 361 A PHOTONREFLECTOMETER - AN INSTRUMENT FOR THE MEASUREMENT OF TURBID SYSTEMS. R. L. Libby. J. Immunol. 34, 71-73 (Jan. 1938). An instrument for measuring the turbidity of liquids is described in this paper, which is included on account of the possibility of the application of the method to the estimation of the turbidities of impinger dust samples. Light from a constant source is condensed by lenses and transmitted in a parallel beam through the liquid under observation and falls on a blackened surface, on which a substance causing a current to be generated under the influence of light is placed, not in the direct beam but around it. The E.M.F. generated is registered by a galvanometer and is a measure of the scattered

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Air Hygiene Foundation of America, Inc.
4400 Fifth Avenue,
Pittsburgh, Pa.,
June 14, 1938

HWBB-0009698

REFERENCES TO RECENT LITERATURE ON INDUSTRIAL DISEASES

Correction:

In our notice sent last month regarding Bibliofilm Service, under section (2) the cost of photoprints should read 20 cents for the article, plus 10 cents per page, instead of 5 cents per page, as stated. All statements as to comparative cost still hold true.

(A) News Items

- 398 COMPENSATION FOR SILICOSIS. Labor Standards 1, 4-5 (April 1938).
Upon recommendation of Industrial Commissioner Elmer F. Andrews, the New York Legislature is now considering a bill to put compensation for total disability or death due to silicosis or other dust diseases on the same basis as that for accidental injuries and death. The amendment provides for stepping up the compensation gradually over a period of 5 years. This recommendation is based upon experience under the present act which indicates clearly that compensation for silicosis is materially less costly than was predicted by the opponents of the act. During the first 18 months of operation under the silicosis amendment there was a total of 18 awards with an approximate cost of \$12,000. The pending amendment carries a further recommendation of the commissioner liberalizing the period of time allowed for medical treatment. Here again experience has shown that the limitation of medical treatment of 3 months in the present statute lost sight of the cases that were complicated by tuberculosis.
- 399 SILICOSIS BILL. Labor Standards 1, 6 (May 1938).
A bill to regulate interstate commerce in goods produced under conditions exposing employees to the hazards of silicosis and related dust diseases has been introduced by Congressman O'Connell of Montana.
- 400 COOPERATING TO ENFORCE WORKMEN'S COMPENSATION. Labor Standards 1, 5 (April 1938).
Pointing out that 185 claims had been filed with the Ohio Industrial Commission during the last half of 1937 by employees whose employers had failed to comply with the workmen's compensation law, Thomas J. Donnelly, secretary-treasurer of the Ohio State Federation of Labor, urged workers on a job where three or more were employed to demand proof of their employer that he was paying into the State insurance fund, if notice of compliance was not posted. Injured workmen are protected in such cases, as the employer is liable; but considerable delay is sometimes experienced, since the claim must be turned over to the attorney general for collection and since it is often necessary to enter suit and secure judgment.
- 401 NORTH CAROLINA'S X-RAY TRAILER. Labor Standards 1, 6 (April 1938).
The North Carolina Department of Health and The Industrial Commission have jointly operated a cruising X-ray laboratory since last summer to evaluate occupational diseases in the state and to make preemployment examination of persons entering industries that mine or process siliceous minerals. (A similar cruising laboratory in use in New York has been mentioned in abstract 188.)



by dust exposure per se, but rises only after silicosis becomes definitely established. Control of the foundry hazard is believed to be best accomplished by elimination at its source of the dust generated by sandblasting, sand chipping, sand grinding and shake-out operations. Combined with this, pre-employment and periodic examinations are essential so as to prevent tuberculous individuals from carrying on a dusty trade and to discover new infection and reactivation cases as they arise.

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- 416 ISOLATION OF THE MINERAL DUST IN THE LUNGS AND SPUTUM. N. Sundius and A. Bygden. J. Ind. Hyg. & Toxicol. 20, 351-9 (May 1938). Authors are Swedish and we have no information on reprints.

The authors discuss various methods for the separation of mineral dust from lung tissue, pointing out their disadvantages in that they may alter the composition of the dust. They recommend treatment with perhydrol (concentrated hydrogen peroxide) as avoiding material decomposition of the original dust. Organic acids may be generated during the decomposition process, but their action is weak, except on carbonates, which are mostly dissolved. The characteristic ingredients of asbestotic lungs, the "asbestos bodies", however, are more resistant and undergo no morphological changes, but the organic matter contained in their envelopes is chemically attacked and more or less destroyed. The method was found useful in separating iron ore dust in sputum in a practically unchanged state. In cases where the lung dust contains carbonates or if asbestos bodies are to be isolated without chemical alteration, only a purely mechanical method is applicable. For this purpose a procedure has been practised comprising a fine grating of the lung and a subsequent separation of the mineral contents and the asbestos bodies from the organic matter by centrifuging in heavy liquids, among which acetylene tetrabromide diluted with benzene has proved particularly useful. This mixture may also be used to remove carbon from the mineral constituents.

- 417 THE BIOCHEMISTRY OF SILICIC ACID. V. THE SOLUTION OF SILICA AND SILICATE DUSTS IN BODY FLUIDS. E.J. King and M. McGeorge. Biochem J. 32, 417-425 (Feb. 1938). Reprints probably obtainable from Banting Institute, Toronto, Ont.

The solubility of silica in various liquids has been given considerable study, with widely varying results by many workers. The authors discuss some possible causes of these differences and describe their own method in detail. The solutions used were blood serum and ascitic fluid. The dusts used were quartz, flint, feldspar, asbestos, sericite, amorphous silica, fuller's earth, kaolin, talc and several air-borne dusts. The results show that free silica dissolves more quickly than silicate minerals, indicating the possibility that alkaline earth silicates dissolve slowly in alkaline media, while the slightly acidic nature of free silica may favor its solution in alkaline liquids.

- 418 THE BIOCHEMISTRY OF SILICIC ACID. VI. THE SOLUTION AND EXCRETION OF SILICA.

E.J. King and M. McGeorge. Biochem. J. 32, 426-433 (1938). The authors have attempted to correlate urinary excretion of silica with the quantity administered orally, intraperitoneally and intratracheally. Cats were used in all experiments. The materials used were quartz, flint, feldspar, sericite, fuller's earth, talc, steatite and several other dusts. Silica determinations in the urine were made by King and Dolan's method, which is described in this paper. The authors found that the greatest increase in urinary output of silica followed the administration of free silica, especially oral. Some of the silicates were unaffected while others were partly decomposed. No conclusion could be drawn from the experiments on inhalation.

Air Hygiene Foundation of America, Inc.
4400 Fifth Avenue
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REFERENCES TO RECENT LITERATURE ON INDUSTRIAL DISEASES

(A) News Items

- 620 GENERAL MOTORS CORPORATION MEDICAL CONFERENCE. Ind. Med. 7, 469-70 (August 1938).
The Medical Conference of General Motors' Physicians was held at Flint, Mich., May 19 and 20. Most of the papers presented were published in Industrial Medicine for August. Those dealing with air hygiene and general industrial health are abstracted in this bulletin, with the statement that they were presented at this meeting, and with the authors' addresses, so that reprints may be requested. However, we have as yet had no opportunity of learning whether reprints of any particular paper are available. The same applies to the remaining papers presented at the Midwest Conference on Occupational Diseases.
- 621 EXHIBIT OF LEAD HAZARDS. Safety Eng. 76, 51 (August 1938).
An exhibit showing causes of lead poisoning has recently been released by the U. S. Dept. of Labor. The setting is a dusty and corroded lead pot of actual size. Lead gains entrance into the body by three principal means, namely, breathing, swallowing and through the skin; and each is depicted in a miniature setting, viewed through the charging door of the pot. The settings revolve on a vertical axis and consist of actual scenes in miniature. The exhibit is operated by alternating current and is available for use at safety conferences, state fairs, and large expositions and exhibits, and can be borrowed through the Exhibits Office of the U. S. Department of Labor by groups who are willing to pay freight charges.
- 622 THE W. S. KNUDSEN AWARD. Ind. Med. 7, 517 (August 1938).
It was announced at the meeting of the American Association of Industrial Physicians and Surgeons at Chicago in June that William S. Knudsen, President of the General Motors Corporation, will make an award to the industrial physician who, by the time of the next annual meeting, in 1939, shall have been responsible for the most outstanding contribution to industrial medicine. A committee has been appointed to decide on the award.
- 623 COURSE ON INDUSTRIAL HYGIENE. Ind. Med. 7, 111 (August 1938).
The Committee on Graduate Education of the Allegheny County Medical Society announces an intensive course for physicians on industrial hygiene, given in cooperation with the Department of Industrial Hygiene of the University of Pittsburgh, Oct. 24 to 28, inclusive. It will consist of lectures and conferences on prevention, diagnosis and treatment of occupational health hazards, methods of medical and engineering control of such problems, and present day legal aspect of occupational diseases. By way of actual demonstrations of medical supervision in industry, a tour of representative plants will be made. Registration is limited to 45. Full particulars are obtainable from Department of Industrial Hygiene, University of Pittsburgh, Pittsburgh, Pa.

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References to Recent Literature - 6

- 640 THE APPLICATION OF DUST-CONTROL PRINCIPLES TO FOUNDRY OPERATIONS. R. R. Meigs. Second N. E. Regional Foundry Conf., Mass. Inst. Tech., April 8, 1938. The paper presents a discussion of the principal sources of dust in each of the several operations of a foundry and outlines practical applications of control in each case. The subject is considered under 5 main headings: (1) molding, (2) coremaking, (3) shake-out, (4) sand conditioning and (5) castings cleaning. Many practical suggestions are made in regard to care, maintenance and methods of operation that will tend to improve existing conditions. The author has avoided consideration of the dust concentrations that may be encountered and the pathological effects of the dusts. A discussion by Manfred Bowditch and an additional paper by W. F. Terry combine to make the study an excellent and comprehensive treatment of the elements of dust control in foundries.
- 641 RECENT DUST EXHAUST APPARATUS. F. Prockat. Staub 6, 249-87 (1937). (German). First is a description, with examples and illustrations of the most important points of exhaust apparatus and the various kinds of dust removal: gravity systems, removal by utilizing the mass inertia, by centrifugal force, by filters, etc. The author then describes exhaust hoods, partly in agreement with those expressed in Drinker and Hatch's book, partly also on the basis of some of his own investigations of piping installations.
- 642 WORK OF THE DUST CONTROL OFFICE IN COOPERATION WITH GERMAN INDUSTRIAL COMPANIES. A. Laemmert. Staub 7, 365-71 (1937). German insurance carriers, because of silicosis compensation have become more interested in dust control. To furnish lacking data and knowledge of the physics and technic of dusts a central office was set up to do what could not be done individually. The central office set up a laboratory, began consulting individual inspectors and industries and investigating all problems bearing on dust control. Most of the interested companies joined.
- 643 ASBESTOS. S. R. Gloyne and E. R. A. Merewether. Occupation and Health, Supplement, 15 pp. International Labor Office, Geneva (1938). Information obtainable from International Labor Office, 734 Jackson Place, Washington, D. C. This is one of several brochures recently issued as a supplement to the 2-volume Encyclopedia on Occupation and Health. It is a treatise on asbestos, including physical properties, chemical composition, uses, extraction, manufacturing process, and especially risks to health. The discussion of asbestosis includes its essential features, diagnosis, pathological features, distinction from tuberculosis, preventive measures and compensation. The references to difficulties in diagnosis and to formation of asbestosis bodies, illustrated by 41 drawings, are of special interest. The most important single clinical sign of asbestosis is that of diffuse bilateral impairment of the percussion note, slight in degree and associated with a slight sense of resistance. The other important feature is the radiographic examination of the chest. The distinguishing features between asbestosis and silicosis in x-ray pictures are listed. It is emphasized that neither method alone is conclusive, but that asbestosis can be diagnosed with certainty with the aid of both, even if symptoms and disablement are absent. In difficult cases where extensive tuberculosis is present, careful investigation of the subjects' exposure to asbestos dust will enable the correct decision to be reached. The preventive measures are based largely on the principles of the British Code of Regulations. The views expressed are authoritative and very instructive.
- 644 PREVENTION OF ASBESTOSIS IN INDUSTRY. F. Prockat. Staub. 5, 133-62 (1937). The paper includes a description of asbestos, and of its various forms, its uses and methods of preparation for industrial purposes. It is shown by many illustrations how dust can be decreased in certain processes by installation of exhaust systems and practical planning.

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REFERENCES TO RECENT LITERATURE ON INDUSTRIAL DISEASES

(A) News Items

- 700 INDUSTRIAL HYGIENE--AMERICAN PUBLIC HEALTH ASSOCIATION. Ind. Med. 7, 589 (September 1938).

The Industrial Hygiene Section meeting of the 67th annual convention of the American Public Health Association to be held at Kansas City, October 25-28, 1938, should contain material of interest to all who have industrial medical problems. The addresses, as they are published, will be abstracted in this bulletin.

- 701 NATIONAL SAFETY CONGRESS. Ind. Med. 7, 589 (September 1938).

The National Safety Congress and Exposition will hold its annual meeting October 11-14 at the Stevens Hotel, Chicago. There will be sessions on Dusts, Fumes, Gases and Vapors; Industrial Nursing; Occupational Disease, and Health Services in Industry. Any articles of interest will be noted and abstracted in this bulletin.

- 702 NEW BOOKS

OCCUPATION AND HEALTH--SUPPLEMENT. International Labor Office, 734 Jackson Place, Washington, D. C.

This supplement, which will consist of 500 pages when completed, can be purchased for \$5.00. The first installment to this last supplement comprises 86 pages and includes five brochures on "Allergy and Occupation," "Asbestos," "Beryllium," "Pneumoconiosis," and "Silicosis."

TOXICITY OF INDUSTRIAL ORGANIC SOLVENTS.

A compilation by Ethel Browning, of the numerous solvents used in industry. It discusses properties, uses and toxicity, and should be a valuable reference to those interested. The book is a British Publication. The U. S. address is The British Library of Information, 270 Madison Ave., New York City. Price 7s 6d (about \$2.00).

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

- 703 PNEUMOCONIOSIS (PULMONARY DISEASE DUE TO DUST). L. Teleky. Occupation and Health, Supplement, Internat. Labor Office, Geneva (January 1938). (One of the supplements mentioned in News section of this Bulletin).

This is one of the best reviews and one of the most readable that has yet been written on the subject. Dr. Teleky has placed the dusts into 8 classes according to actions as follows, briefly: irritants, coniotic action over long periods, micro-chemical action forming lesions (quartz), chemical action with inflammatory processes, cancerogenic action, allergic action, infectious action and toxic action. In the first half of the paper, mechanics and physiology of dust inhalation are considered, together with concentrations found and the pathological and roentgenographical significance of mixtures. The second half discusses the effects of breathing various dusts, including grain dusts, dusts like

References to Recent Literature - 2

- Thomas slag, and various minerals. Bibliography is brief, and is limited to well-known references.
- 704 **PATHOLOGY OF THE SILICOTIC NODULE.** Joseph Walsh. *Am. Rev. Tuberc.* 39, 363-71 (September 1938). White Haven Sanatorium, White Haven, Pa.
The author presents the results of 20 years of observation of anthracosilicotic lungs, with several photomicrographs of affected lymph nodules. In his summary, he states that anthracosilicotic dust within the tissues of the lung is always found in cells until after necrosis sets in. These cells are carried in lymph channels to intrapulmonary and hilar nodes. The pulmonary fibro-anthracosilicotic nodule begins by thickening of the interstitial tissue around lymphatics, the development of fibrous tissue in alveolar walls and destruction of the elastica which allows the alveoli to collapse. The typical single nodule is smaller than a millet seed and is made up principally of collapsed and coalesced alveolar walls. Later occur hyalinization and necrosis beginning in the interior. A large nodule is always conglomerate, and is made up of the coalescence of innumerable small ones. The silicotic nodule and its points of difference from the pulmonary nodule are described.
- 705 **SILICOSIS AND SIMILAR DUST DISEASES. MEDICAL ASPECTS AND CONTROL.** R.R. Sayers and R. R. Jones. *U.S. Publ. Health Repts.* 53, 1453-72 (August 19, 1938). Obtainable from Supt. of Documents, Washington, D.C., for 5 cents, cash. This paper, originally presented at the National Silicosis Conference in 1936, is an excellent review of the subject, with especial attention to occupational exposure, factors influencing the action of silica dust particles, the necessity of occupational history, and prevention of silicosis. Asbestosis and anthracosilicosis are considered briefly.
- 706 **RECOVERY METABOLISM OF SILICOTICS.** A. Bohme. *Arch. f. Gewerbepath. u. Gewerbehyg.* 8, 601-10 (1938). (German).
Increased oxygen consumption accompanies all work, partly during work, partly after it (oxygen debt). In cardiac insufficiency and emphysema, oxygen consumption is more delayed in the recovery period; the oxygen debt is greater than normal. In healthy persons consumption is highest after 3, or at most, 6 minutes after stopping heavy work. In comparing normal persons with silicotics with 70-80% disability, the latter showed a marked and prolonged rise in respiration rate, increased minute volume and oxygen consumption during the recovery time and also at the end of the 10 minute observation period. In silicotics with less than 70% disability, the differences were less marked or barely detectable. The method is not applicable for adjudging compensation however, because of other influences--excitement, lack of precision and intentional emphasis of difficulties.
- 707 **THE INFLUENCE OF SILICA ON THE NATURAL AND ACQUIRED RESISTANCE TO THE TUBERCLE BACILLUS.** Arthur J. Vorwald and Anthony B. Delahant. *Am. Rev. Tuberc.* 38, 347-62 (September 1938). Reprints probably obtainable from The Saranac Laboratory, Saranac Lake, N. Y.
The authors investigated the effect of silica on resistance of animals to the tubercle bacillus. Their experiments showed that silica depresses the native resistance of the guinea pig to attenuated tubercle bacilli and of the white rat to virulent types of these microorganisms. Silica also inhibits the development of acquired resistance in guinea pigs when the irritant is confined to the tissue in which the immune bodies are being produced. This adverse influence is specific for silica and is proportional to the concentration of the irritating substance. Dusts low in silica and nonsiliceous dusts have no such effect. The authors suggest as a possible explanation the alteration of

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- 712 CHEMICAL DETERMINATION OF QUARTZ (FREE SILICA) IN DUSTS. E. Kaplan and W. T. Fales. Ind. & Eng. Chem. Anal. Ed. 10, 338 (July 5, 1938).
The writers propose the application of the compound interest law to determine the rate of loss of silica in the Knopf (hydrofluosilicic acid) and the Line and Aradine (fluoboric acid) methods for the determination of free silica. By applying Knopf's factor of 0.1% loss per day and Line and Aradine's factor of 0.34% loss per day to the mathematical formula derived from the compound interest law, the writers calculate the total free silica loss for any number of days. The chief difficulty with this procedure is that the factor of rate of loss is not constant, but varies widely with different particle sizes as has been demonstrated by Moke and Harris.
- 713 CLINICAL CONSIDERATIONS ON THE QUESTION OF INDUSTRIAL CANCER OF ASBESTOS WORKERS. F. Hornig. Ztschr. f. Krebsforsch. 47, 281-7 (1938). (German).
A 35 year old woman who worked in an asbestos factory from 1919 to 1928 fell ill of asbestosis. In 1937 a sharply defined shadow was seen roentgenographically in the upper left lobe. This shadow was considered by the author to be a carcinoma and in the decision on the case, a causal relation between the presence of asbestosis and the development of carcinoma was accepted. The correct diagnosis of carcinoma was confirmed on autopsy.
- 714 THE INDUSTRIAL CANCER OF WORKERS IN ASBESTOS. M. Nordmann. Ztschr. Krebsforsch. 47, 288-302 (1938).
The author describes 6 cases of asbestosis with lung carcinoma, of which 5 were squamous carcinoma with hornification and the other an adenocarcinoma. Most of the cases were younger than the average case of lung cancer. The exposure to asbestos had lasted 7 to 21 years, and had begun 15 to 20 years before observation of the carcinoma, with the exception of an elderly woman who had only an exposure of 19 months, 17 years before observation, and who had a high degree of asbestosis. What property of asbestos is responsible for the cancer developing on the groundwork of asbestosis is not yet known, but there may be in asbestos so-called carcinogenic substances.
- 715 TESTS OF A BARRIER USING ROCK DUST IN PAPER BAGS. H. P. Greenwald and H. C. Howarth. U.S. Bur. Mines, Rept. Investigations No. 3411, 18 pp., (August 1938). Obtainable free from Division of Information, U.S. Bureau of Mines, Washington, D. C.
A recently developed method of explosion barrier is tested by the Bureau. The method consists in dusting with limestone placed in paper bags which are mounted on posts in trackless entries. The bags are mounted in such a way as to be automatically opened by the shock waves in advance of an explosion and complete description is given of the technique used. The ten tests made were successful in every case but one. They are described as cheaper than those methods recommended in their Bulletin No. 353 but are not recommended for entries provided with track. The limestone used is especially treated to increase resistance to moisture.
- 716 SOME OBSERVATIONS ON COAL-MINE FANS AND COAL-MINE VENTILATION. D. Harrington and E. H. Denny. U.S. Bur. Mines, Inf. Circ. No. 7032, 20 pp. (August 1938). Obtainable free from Division of Information, U.S. Bureau of Mines, Washington, D. C.
Ventilation is one of the most important single operations in mining for protecting lives and in promoting efficiency of operation. During 1932 and 1935 inclusive, the explosion record in coal-mines was very good but during 1937 and 1938 experience has been bad, and it is suggested that the cause may be due

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4400 Fifth Avenue,
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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 Drinker, 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 O. 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, The Moore School X-Ray Laboratory.
- "Industrial and Public Relations Aspects of Industrial Health." V.F. ... Executive Secretary, National Industrial Sand Association.

References to Recent Literature - 5

- 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. Dreesen, 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.

03117899

Mr. Brown

Air Hygiene Foundation
4400 Fifth Avenue
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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 Seligman (N.Y.) Laboratory for studies of "mixed" dusts and "protector" dusts in combating dust diseases; Harvard University for two graduate fellowships in 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, 1938, 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.

B.I. Castleman 22



References to Recent Literature - 2.

- 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. 735), 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

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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.G.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,

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 75 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 (73%) 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. H.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.