FILE NAME: aŜNJŎ] ó a Yú

DATE: мфпо

DOC#: a Yллн

5OCUMENT DESCRIPTION: .ƨƨ] 9ÈŎŜNJLJű π hűĸŜN tƴŜdzY˙ƨŏƨyƛƨăŜă ώ¢ĸŜ tNJƛƴŎƛLJfŜă ƽ tNJl·ŎűƛŎŜ ƨŦ LyŘdzăűNJƛl·f a ŜŘƛŎƛyŜ

The Principles and Practice of

INDUSTRIAL MEDICINE

Edited by

FRED J. WAMPLER, M.D.

Professor, Preventive and Industrial Medicine

MEDICAL COLLEGE OF VIRGINIA

CONTRIBUTORS

Otis L. Anderson
R. N. Anderson
Anna M. Baetjer
J. J. Bloomfield
J. A. Calhoun
J. M. Carlisle
George H. Cross
Donald E. Cumming
Charles F. Engel
John H. Foulger
Augustus Gibson
T. Lyle Hazlett
Albert Hemming
F. F. Heyroth
Joanna Johnson
R. T. Johnstone
Robert A. Kehoe
M. H. Kronenberg
B. E. Kuechle
Matthew Luckiesh
Willard Machle
R. W. McKee
Sarah I. Morris
Kenneth Morse
Frank K. Moss
C. M. Peterson
D. F. Robertson
F. S. Rossiter
William A. Sawyer
Louis Schwartz
Lorin A. Thompson
Fred J. Wampler
George Zur Williams

A William Wood Book

BALTIMORE

THE WILLIAMS & WILKINS COMPANY

1913

LIST OF CONTRIBUTORS

ANDERSON, OTIS L., B.Sc., M.D., F.A.C.P.
Surgeon, United States Public Health Service, Assistant Chief, Division of Venereal Diseases, National Institute of Health, Bethesda, Maryland.

ANDERSON, RICHARD N., B.A., M.A.
Director of the Division of Rehabilitation, Special and Adult Education of the Virginia State Department of Education, Richmond, Virginia.

BAETJER, ANNA M., Sc.D.
Associate in Physiological Hygiene, School of Hygiene and Public Health, The Johns Hopkins University, Baltimore, Maryland.

BLOOMFIELD, J. J.
Sanitary Engineer, United States Public Health Service, and Chief, States' Relations Section, Division of Industrial Hygiene, National Institute of Health, Bethesda, Maryland.

CALHOUN, J. A., M.D.
Medical Director, American Viscose Corporation, Wilmington, Delaware.

CARLISLE, J. M., M.D.
Medical Director, Merck and Company, Rahway, New Jersey; Professor of Industrial Medicine, Temple University School of Medicine, Philadelphia, Pennsylvania; Executive Director, Bureau of Industrial Health and Hygiene, New Jersey State Department of Health.

CROSS, GEORGE H., M.D.
Associate Professor of Ophthalmology, University of Pennsylvania, Graduate School of Medicine, Chester, Pennsylvania.

CUMMING, DONALD E., B.S.*
Associate Professor, Department of Medicine, and Director, Division of Industrial Hygiene, University of Colorado School of Medicine, Denver, Colorado.

ENGEL, CHARLES F., M.D.
Assistant Medical Director, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pennsylvania.

FOULGER, JOHN H., M.D., PH.D., F.A.C.P.
Medical Director, Haskell Laboratory of Industrial Toxicology, Wilmington, Delaware; Associate Professor of Industrial Medicine, Medical College of Virginia, Richmond, Virginia.

* Deceased December, 1942.

GIBSON, AUGUSTUS, M.D.
Physician, Merck and Company, Rahway, New Jersey.

HAZLETT, T. LYLE, M.D.
Medical Director, Westinghouse Electric and Manufacturing Company; Professor, Industrial Hygiene, University of Pittsburgh, Pittsburgh, Pennsylvania.

HEMMING, ALBERT, M.B., Ch.B.
Physician, Merck and Company, Rahway, New Jersey.

HEYROTH, FRANCIS F., M.D.
Assistant Professor of Research Physiology, Kettering Laboratory of Applied Physiology, College of Medicine, University of Cincinnati, Cincinnati, Ohio.

JOHNSON, JOANNA, R. N.
Supervisor, Industrial Nursing Division, Employers Mutual Liability Insurance Company, Milwaukee, Wisconsin.

JOHNSTONE, RUTHERFORD T., A.B., M.D.
Director of the Department of Occupational Diseases, Golden State Hospital, Los Angeles, California; Formerly Assistant Professor of Medicine, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania.

KEHOE, ROBERT A., M.D.
Research Professor of Physiology, Director, Kettering Laboratory of Applied Physiology, College of Medicine, University of Cincinnati, Cincinnati, Ohio.

KRONENBERG, MILTON H., M.D.
Chief, Division of Industrial Hygiene, and Industrial Medical Supervisor, Department of Public Health, State of Illinois; Assistant Professor of Bacteriology and Public Health, University of Illinois Chicago, Illinois.

KUECHLE, B. E., A.B.
Vice-President and Claims Manager, Employers Mutual Liability Insurance Company, Wausau, Wisconsin.

LUCKIESH, MATTHEW, D.Sc., D.E.
Director, Lighting Research Laboratory, General Electric Company, Nela Park, Cleveland, Ohio.

MACHLE, WILLARD, M.D.
Associate Professor of Research Physiology, Associate Director, Kettering Laboratory of Applied Physiology, College of Medicine, University of Cincinnati, Cincinnati, Ohio.

McKEE, R. W., PH.D.
Instructor in Industrial Hygiene, School of Public Health, Harvard University, Boston, Massachusetts.

MORRIS, SARAH I., M.D., F.A.C.P.
Professor of Preventive Medicine, Womans Medical College of Pennsylvania, Philadelphia, Pennsylvania.

MORSE, KENNETH, M.S.
Industrial Engineer, Division of Industrial Hygiene, Illinois State Department of Public Health, Chicago, Illinois.

MOSS, FRANK K., E.E.
Physicist, Lighting Research Laboratory, General Electric Company, Nela Park, Cleveland, Ohio.

PETERSON, C. M., M.D.
Secretary, Council on Industrial Health, American Medical Association, Chicago, Illinois.

ROBERTSON, D. F., M.D.
Associate Medical Director, Merck and Company, Rahway, New Jersey.

ROSSITER, FRANK S., M.D.
Medical Director, Carnegie-Illinois Steel Company, Pittsburgh, Pennsylvania.

SAWYER, WILLIAM A., M.D.
Medical Director, Eastman Kodak Company, Rochester, New York.

SCHWARTZ, LOUIS, M.D.
Medical Director, United States Public Health Service, and Chief, Dermatoses Investigations Section, Division of Industrial Hygiene, National Institute of Health, Bethesda, Maryland.

THOMPSON, LORIN A., PH.D.
Director, Population Study, Virginia State Planning Board, Richmond, Virginia.

WAMPLER, FRED J, M.A., M.D., M.P.H.
Professor, Preventive and Industrial Medicine, and Administrator, Out-Patient Clinic, Medical College of Virginia; Health Consultant, Southern Biscuit Company, Richmond, Virginia.

WILLIAMS, GEORGE ZUR, M.D.
Associate Professor of Pathology, Medical College of Virginia, Richmond, Virginia; Member of Armed Forces, Lt. Com. U.S.N.M.C.R.

VII. OTHER PNEUMOCONIOSES

There is considerable disagreement in the medical literature concerning the exact etiology of certain types of pulmonary fibrosis due to dust inhalation other than silica dust. Asbestosis, siderosis, and anthracosis are the most important of these fibroses.

Asbestosis

It has been well proven that a peculiar type of linear pulmonary fibrosis is caused by minute asbestos fibers inhaled by workers in industries utilizing asbestos for the manufacture of fire resisting material, insulation, certain fabrics and ropes, paints, roofing, tile, etc., as well as the manufacture of asbestos itself.

Asbestos is magnesium silicate and is the only silicate which has experimentally been proven to produce a pulmonary fibrosis without exposure to silica.

The onset and clinical course of asbestosis is similar to that of slowly progressing silicosis and the symptoms in the later stages are identical. Fatal termination is usually by complicating pneumonitis, cardio-vascular decompensation, or tuberculosis. The roentgenopathology is typical and not difficult to differentiate from silicosis. Gloyne and Merewether state that the roentgenological appearances of asbestosis are revealed typically as a general lack of translucency with a fine pinhead mottling. This is the characteristic "ground glass" appearance. The film should always be compared with a film of a normal patient and a film of a silicotic patient taken with the same exposure.

The diagnosis depends upon a definite history of exposure to asbestos dust including sufficient period of exposure, roentgenological appearance, decreased pulmonary capacity, and the finding of asbestos bodies in the sputum of patients not yet removed from exposure to the dust. These asbestos bodies are well described and usually illustrated in most text books of clinical pathology. The pathology may be summarized in the single statement that it consists of a persistent, progressive, diffuse perialveolar fibrosis of the lungs. The fibers may be seen on histological examination to lie embedded in the fibrous walls of alveoli and bronchioli and each fiber appears to be encrusted by an iron-containing yellow pigment. As would be expected, in the later stages the fibrosis becomes confluent and massive.

Siderosis

Siderosis is chiefly a red pigmentation of the lung tissue due to inhalation of iron-containing dust frequently found in hematite miners. Experimentally, fibrosis has not been produced by pure iron or iron oxide dust

and only when mixed with hazardous concentrations of silica dust does fibrosis result. Therefore, unless the patient is also affected with silicosis siderosis by itself is asymptomatic and produces no roentgenological or clinical findings.

Anthracosis

Black pigmentation of the lungs due to inhalation of smoke and other types of carbon particles is common particularly in residents of large industrial cities. Most marked blackening is produced in coal miners. There is some controversy concerning the question as to whether or not carbon dust of itself can produce a pulmonary fibrosis. There is no conclusive experimental evidence that pure carbon dust will produce fibrosis. It is the author's opinion that all instances of fibrosis in anthracotic lungs are due to an admixture of silica dust in the inhaled air or an inflammatory fibrosis due to respiratory disease. Anthracosis is asymptomatic and produces no clinical findings or disability.

REFERENCES

American Public Health Association: Report (joint) of the Committee on Pneumoconiosis and the Committee on Standard Practices in Compensation of Occupational Diseases, Year Book, 1933, p. 100.

Belt, T. H., Irwin, D., and King, E. J.: Silicon and dust deposits in the tissues of persons without occupational exposure to siliceous dusts. Canadian Med. Assoc. J., **34** (2): 125–133, 1936.

Burke, H. E.: The detection of mineral particles in the sputum in silicosis. J. Ind. Hyg., **17**: 27, 1935.

Cole, L. G., and Cole, W. G.: Dyspnea of silicosis: What causes it? J. A. M. A., **113**: 1216, 1939.

Cummins, S. L.: The augmentation of action of anthracite and other dusts by dead tubercle bacilli. Brit. J. Exp. Path., **21**: 64–70, Feb. 1940.

Drinker, P., and Hatch, T.: Industrial Dust. McGraw-Hill, 1936.

Ellman, P.: Pulmonary asbestosis: its clinical, radiological and pathological features, and associated risk of tuberculous infection. J. Ind. Hyg., **15**: 165, 1933.

Gardner, L. U.: Pathology of so-called acute silicosis. Am. J. Pub. Health, **23**: 1240, 1933.

Gardner, L. U.: The pathology and roentgenographic manifestations of pneumoconiosis. J. A. M. A., **114**: 535–545, Feb. 17, 1940.

Gardner, L. U.: Recent developments in relation to silicosis. Ind. Med., **9**: 45–49, Feb. 1940.

Gardner, L. U.: Studies on experimental pneumonokoniosis. V. The reactivation of healing primary tubercles in the lung by the inhalation of quartz, granite, and carborundum dusts. Am. Rev. of Tuberc., **20** (6), 833, (Dec. 1929).

Gloyne, S. R., and Merewether, E. R. A.: Asbestosis. O. & H., (Brochure), 1938.

Hatch, T., and Thompson, E. W.: A rapid method of dust sampling and approximate quantitation for routine plant operation. Ibid., **16**: 92, 1934.

International Labour Office: Pneumoconiosis, a list of references, studies and reports, series F (Ind. Hyg.), No. 15, 1932.