

REFERENCES TO RECENT LITERATURE

Air Hygiene Foundation of America, Inc.,
4400 Fifth Avenue,
Pittsburgh, Pa.,
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PLAINTIFF'S
EXHIBIT

RR-207b

A. News Items

236. BUREAU OF INDUSTRIAL HYGIENE FOR WISCONSIN. Surv. Labor Law Admin. 12, Mar. '37. A bureau of industrial hygiene is planned in the Wisconsin State Health Department, through cooperative efforts of State and Federal Health Departments. This bureau is to render technical service to the Industrial Commission, which is charged with the responsibility of enforcing rules and regulations, assuring safe and healthful working conditions in the state. (The March, 1937, issue of the Survey of Labor Law Administration, including this and the following items with other material of interest, can be obtained on application to the Division of Labor Standards, U. S. Department of Labor, Washington, D. C.)
237. INDUSTRIAL HEALTH LEAFLETS. Surv. Labor Law Admin. 12, March 1937. The Division of Labor Standards has prepared four additional Industrial Health Leaflets, dealing with cause and prevention of methyl alcohol, carbon tetrachloride and carbon bisulfide poisoning and carbon dioxide asphyxiation. Copies will be available for distribution in the near future. Those now obtainable include: (1) industrial skin diseases, (2) anthracosilicosis, (3) arsenic, (4) carbon monoxide, (5) chromium, (6) mercury, (7) lead, (8) benzene poisoning and (9) silicosis. They are very brief, but present the extent of exposure and fundamental rules of prevention for employees and workers. They are obtainable from the Superintendent of Documents, Washington, D.C., at 5 cents each. The numbers given above are the numbers of the leaflets.
238. HEALTH OF GRANITE CUTTERS. Surv. Labor Law Admin. 12, March 1937. The U. S. Public Health Service made an extensive study of health conditions among granite workers in Barre, Vermont, in 1928, and is now beginning a reexamination. The results of the present study should furnish additional important data concerning silicosis under controlled and uncontrolled conditions.
239. NATIONAL INSTITUTE OF LABOR, MEDICINE & HYGIENE FOR MEXICO. Surv. Labor Law Admin. 12-13, March 1937. The Mexican Government has been requested by its Labor Department to appropriate funds for a National Institute of Labor, Medicine and Hygiene. A recent cooperative meeting has given impetus to a general movement to improve health conditions, including the establishment of that Institute.
240. ILLINOIS CODES ON SAFETY AND HEALTH. Surv. Labor Law Admin. 14, March, 1937. The Industrial Commission has appointed committees representative of all interested agencies and is proceeding with the development of codes on safety and health. A policy committee has been formed to guide the work generally and to avoid duplication and overlapping of codes. The codes of other States and other safety information collected by organizations are being used freely as source material.
241. THE DUST STILL FLIES. Eng. News Rec. 118, 456 March 25, 1937. Last June New York State enacted a law to reduce the silicosis hazard in rock drilling and excavation, but the law is still inactive, awaiting action of the Industrial Commission in formulating a code for its application and administration. The main cause of delay is a protest by cement and

gypsum interests over the technical definition of silica-bearing rock. The editor urges the end of quibbling over the definition, and action on the law, so that all concerned may know where they stand.

242. FIRST AIR CONDITIONED METAL MINE. Mining Cong. J., 23, March, 1937. P. 41. Installation of air conditioning with mechanical refrigeration in the Magna copper mines at Superior, Arizona, was announced by W. E. Carrier. The normal temperature at the depths of 3400 to 3600 is 95 to 100° with high humidity. A forced ventilating system is used.
243. MINERS' PHTHISIS IN SOUTH AFRICA. Iron and Coal Trades Rev., 134, 454 (March 5, 1937), from So. African Min. and Eng. J. The years since attention was first directed to silicosis and precautionary measures were undertaken have seen a continual decrease in its prevalence. Silicosis cases now number less than half of what they were in 1920 to 1923. There has been a slight upturn in the past year but it is no cause for alarm. One probable cause is the great increase in the number of miners. The increased amount of rock drilling is probably a factor. The reduction of dust from this source is now being studied.

B. General and Scientific Papers

In cases where we know or believe that reprints are obtainable from American and some other authors, their addresses are given.

A few papers under this heading and many under the next one are by French and German authors. In many cases reprints in the original language are probably available from the authors, but considerable delay will be involved, both in locating the author's address and in sending for the reprint. We suggest in order to avoid some of that delay, to order a copy of the periodical giving the name of the periodical (as abbreviated here), and the month or day of issue if given, or the pages included if not, from G. E. Stechert & Co., 31 East 10th St., New York, N.Y. They will first quote prices if preferred, but it will probably average 50 cents or so for ordinary publications.

244. SILICA AND SILICATE SOLUBILITIES. Albert C. Titus. J. Ind. Hyg. & Tox., 19, 138-145 (March, 1937). In earlier investigations of the solubility of silica, the methods did not permit distinguishing the silica in true solution from that in the colloidal state, and the results were variable and often apparently too high. The author used a combination of earlier methods with ultra filtration and determined the silica by the colorimetric method of King and Stantial. He found 0.05 mg. silica in 100 cc. water when either pure silica or sericite was dissolved, and 0.1 mg. per 100 cc. from dolomitic chert containing 5% free silica. In blood serum, which contains normally 1 mg. silica per 100 cc., none of the materials mentioned dissolves sufficiently to increase the amount perceptibly. (Reprints are obtainable from the Division of Industrial Hygiene, Harvard School of Public Health, Boston, Mass.)

245. THE OCCURRENCE OF SILICOSIS IN THE MANUFACTURE OF SILICON ALLOYS. Torsten Bruce, J. Ind. Hyg. and Tox. 19, 155-162, April 1937.
The author presents the results of an investigation of the presence of silicosis in two Swedish factories producing silicon alloys. In the process both silicon and silica vapors rise through the furnace and are condensed and given off as dust, in considerable quantities. In one factory 8 out of 18 workmen examined, who had worked 4 to 8 years, were found to have silicosis, 3 being in the second stage. In the other factory, which was much older, 5 out of 26 examined had silicosis, only one being in the second stage, and the first clear case was after 14 years' employment. There were also two other suspected cases after 9 years' employment. The lower incidence in the older plant is evidently due to the use of an exhaust system which removes most of the dust which would otherwise settle in the plant. (In this survey and others made in Sweden, dust counts would have added much to the value of the reports. - Abstractor.) Reprints in English are obtainable from Dr. Bruce, Royal Seraphimer Hospital, Stockholm, Sweden.)
246. FURTHER STUDIES OF THE TOTAL PULMONARY CAPACITY AND ITS SUBDIVISIONS IN CASES OF PULMONARY FIBROSIS. Nolan L. Kaltreider, Walter W. Fray and H. van Zile Hyde. J. Ind. and Tox., 19, 163-176 (April 1937). This paper supplements earlier work by some of the authors, showing the extent of the impairment of lung capacity in cases of fibrosis. In the present paper a correction for age is applied to the earlier results, and new cases are added. As fibrosis increases, the total and vital capacities are reduced, while the residual air and mid-capacity increase. If emphysema is present, the total capacity is not materially changed, but the vital capacity is reduced and the residual air is increased. The percentage of residual air referred to total capacity is proportional to the degree of dyspnea. Individuals with minimal fibrosis do not become worse when removed from the dusty occupation. (Reprints may be obtained from Dr. Kaltreider, University of Rochester, School of Medicine, Rochester, N.Y.)
247. SILICOSIS AND RELATED CONDITIONS. Leroy U. Gardner. J. Ind. Hyg. & Tox., 19, 111-125 (March, 1937)
The first clarifying studies of silicosis in 1915 gave results that have been repeatedly confirmed by subsequent investigators, namely, that free silica is the only cause of silicosis, that the action of silica is chemical and not mechanical, and that pure silicosis is not infective, that it renders the patient more susceptible to tuberculosis, and that other dusts, including silicates (except asbestos) do not produce any type of fibrosis. The author defines silicosis as "a chronic disease resulting from the prolonged inhalation of particulate silica." The most distinguishing characteristic of silicosis is the presence of fibrotic nodules, found especially in the nodes of lymphatic vessels, and caused by irritation resulting from the presence of free silica. The only other cause of similar nodules is the tubercle bacillus; no other inorganic material (except asbestos) produces similar effects. The complications that arise from silicosis include neither pneumonia, which seems to be retarded rather than assisted; nor heart and kidney diseases in spite of statements to the contrary based on isolated cases. Emphysema (inflammation of lung tissue) sometimes exists, but the most important complication is tuberculosis. It has been fully established, statistically and experimentally, that tuberculosis is much more common among silicotics than among normal persons. The tuberculosis of silicotics, however, exists in such a modified form that the distinguishing term silico-tuberculosis is generally applied. In most cases silico tuberculosis is difficult to diagnose, especially in the early stages, because the bacilli

build up an extension of the fibrous tissue and other local reactions and are not expelled through the sputum, from which they are often absent until just before death. This increased susceptibility to tuberculosis has not been explained satisfactorily. Various theories have been presented, but none of them has been conclusively established, and much more work is necessary in that field. Diagnosis of silicosis, whether pure or complicated by tuberculosis, is difficult because there are few physical manifestations before the final stage. It must be based on X-ray examination and a complete occupational history, including that of exposure to dust and the concentration and composition of the dust. In a very general way it can be said that prolonged exposure to free silica dust in excess of 5 or perhaps 10 million particles of free silica is sufficient to produce silicosis, but the action of silica is so modified by the presence of other dusts that higher free silica concentrations may be harmless when other dusts are present. Much more experience will have to be acquired before any general standard of permissible dustiness can be established. The difficulty of recognizing both pure silicosis and silico-tuberculosis in their earlier stages, and therefore of beginning adequate treatment before it is too late, makes periodic and thorough examinations indispensable. The real solution of the problem is dust prevention. "The time is not far distant when dangerous concentrations of dust will no longer be permitted in American industries. They have been reduced to safe limits in some of them; they can be in all." (Reprints may be obtained from The Saranac Laboratory for the Study of Tuberculosis, Saranac Lake, N.Y.)

248. QUARTZ IN INDUSTRIAL DUSTS AND DEPOSITS ON HUMAN LUNG TISSUES: X-RAY DIFFRACTION, CHEMICAL AND SPECTROGRAPHIC STUDIES. Victor Hicks, Olive McElroy and Mary E. Wargo. J. Ind. Hyg. and Tox., 19, 177-186 (1937).

Several samples of industrial and atmospheric dusts were examined by X-ray diffraction and spectrographic methods. The methods gave somewhat different results, as they vary in the emphasis on different substances. Silicon was found by the spectrographic method in all the dusts, and quartz was identified by the diffraction method in most of them. Since quartz dust is so generally present in the air, it may be expected in lungs, whether silicotic or not. X-ray examination showed the presence of quartz in 5 out of 8 non-silicotic lung specimens examined, but an unidentified substance was present in others. The silicon content of some lungs in which quartz was thus found was as low as 1.4 mg. silica per gram of dried tissue. (Reprints may be obtained by addressing this office.)

249. REPORT ON 1936 SURVEYS OF MEDICAL SERVICE IN INDUSTRY BY THE AMERICAN COLLEGE OF SURGEONS. M. N. Newquist, Surg. Gynecol. and Obstet., vol. 64, pp 403-406 (February 15, 1937). This paper reviews 1,593 surveys of industrial establishments in the U. S. and Canada. The first point considered is the scope of adequate industrial service, with emphasis on medical examinations and supervision, proper care for industrial diseases, first aid and advice about occupational hazards. The second subject is the confidential nature of physical examination records. Civil courts have ruled that these are confidential. An industrial commissioner, however, may subpoena such information as has an important bearing on a claim for insurance. Only results of examinations expressed in codes should be filed with the worker's employment record. Finally, the problem of medical service for small plants is a special problem. These plants employed 5½ million workers in 1929. The solution of the problem is "group service", i.e., a group of qualified physicians should provide service to groups of small plants.

250. SPECIFIC TISSUE FRACTION TO PHOSPHOLIPIDS. A SUGGESTED EXPLANATION FOR THE SIMILARITY OF THE LESIONS OF SILICOSIS AND PULMONARY TUBERCULOSIS. J.T. Fallon. Canadian Med. Assoc., J., vol 36, 223-228 (March, 1937).
The many similarities between the tubercle and the silicotic nodule led the author to search for a single substance that is produced in both silicosis and tuberculosis and causes the irritation leading to nodule formation. In both cases there are large accumulations of monocytes which degenerate with the production of phospholipids. There is therefore a probability that the phospholipids are responsible for the irritation and resulting fibrosis. This hypothesis was tested by several methods. After injection of silica into various tissues of rabbits the amount of phospholipids increased until the 16th week, when it began to decrease. Silicates introduced similarly produced only a moderate increase in phospholipid content of the lung and no fibrosis. Some of the phospholipid recovered from these animals was filtered to remove silica and then injected into other rabbits. In 4 weeks nodules very much like the silicotic nodules in the early stages were formed. They also simulated lesions already demonstrated by Sabin, who similarly injected phospholipid from the tubercle bacillus. In the author's experiments the possibility remains that some silica in soluble form remained in the phospholipids injected. However, the theory is most attractive, and if fully substantiated answers one of the perplexing questions of the histogenesis and tuberculosis.
(Reprints are probably obtainable from the author, at Banting Institute, University of Toronto, Toronto, Ont.)
251. ETIOLOGY OF SILICOSIS. V. Reichmann. Med. Klin. 33, 226-229 (1937).
The author disagrees with other German investigators who claim to have observed silicotic changes resulting from inhalation of graphite and rust, on the ground that no roentgenological, pathological or histological proof has been presented. Of the 20,000 cases of silicotic lung changes he has seen, he found none that were not caused by several years' exposure to quartz dust. A check of a number of cases of silicosis, allegedly due to other causes, disclosed that there had been sufficient exposure to silica dust to produce the result. Arguments against the Jones sericite theory are also presented.
252. SILICOSIS IN SPAIN. A. Oller. Arch. J. Gewerbepathol, 7, 383-387 (1936).
The author gives statistics on silicosis in the Spanish Rodalquilar gold mines, in which gold is found in layers of quartz, but no sericite is present. The mines are dry drilled and have been in operation for 6 years. Ten workers died from silicosis in 1935, and 32 cases of silicosis were found in the 110 employees. In a ceramic factory 16 cases of silicosis were found among 350 workers. Hygienic improvements have been made in both industries. ==
253. ASBESTOSIS AND ITS PREVENTION. Windel. Arbeitsschutz, 9-16 (1937).
A survey of 11 German asbestos plants employing 385 workers disclosed 22 cases of asbestosis and 13 deaths. A short description of the clinical and X-ray pictures is followed by a careful description of the exhaust systems needed for certain processes with illustrations.
254. THE CARBON CONTENT OF ANTHRACOTIC LUNGS. E. Muller. Arch. f. Gewerbepathol., 7, 316-318 (1936).
A method for determining the carbon content of anthracotic lungs is presented. It consists primarily of pulverizing the tissue, extracting the fat with ether and alcohol, and then treating it repeatedly with concentrated hydrochloric acid. The method can be used also on other tissues.