Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL --- decisions and trends

APRIL, 1957
(Vol. 21, No. 4)

INDUSTRIAL HYGIENE FOUNDATION
MELLON INSTITUTE
4400 FIFTH AVENUE -:- PITTSBURGH 13, PA.

FOUNDATION FACTS

Foundation Facts is a monthly news-letter issued by industrial concerns holding membership in Industrial Hygiene Foundation. The Foundation is a cooperation of industries for the [illegible] industrial working conditions.

Volume 19 April, 1957 No. 4

SCHRENK RECEIVES CUMMINGS MEMORIAL AWARD

Dr. H. H. Schrenk, Research Director of Industrial Hygiene Foundation, received the Donald E. Cummings Memorial Award from the American Industrial Hygiene Association for outstanding contributions to the knowledge and practice of the profession of industrial hygiene. The award was made at the Association's 18th Annual Meeting at the Industrial Health Conference in St. Louis on April 24.

Dr. Schrenk has directed environmental studies in industries throughout the United States and Canada and has been in charge of the programs of toxicological and biological research carried on in the Foundation's research laboratory.

Before joining the Foundation's staff Dr. Schrenk was associated with the Bureau of Mines from 1928 to 1948 where he was Chief of the Health Branch and directed laboratory and research investigations in industrial hygiene. The following year he joined the Commissioned Corps of the United States Public Health Service as Scientist Director. He served as Chief, Environmental Investigations Branch, Division of Industrial Hygiene. He directed the Donora smog investigation conducted by the United States Public Health Service.

In his Cummings Memorial Lecture on "The Growth and Progress in Industrial Hygiene", Dr. Schrenk stressed the need for research in industrial hygiene to keep pace with the new industrial developments and the hazards which may accompany them.

"The creation of new materials carries with it the responsibility to make certain that the usefulness is not outweighed by risks to health," he said.

The benefits of many of the products available today, among them pesticides, synthetic fibers, high energy fuels and new plastics, would not be available today if utilized if it had not been for the efforts of industrial hygienists in evaluating and controlling hazards. The role industrial hygiene plays in industrial progress is probably best illustrated by the development of nuclear energy and its application to industrial processes, Dr. Schrenk pointed out.

In order to be prepared for the industrial and social changes which are occurring at an ever-increasing pace, new tools, instruments and analytical procedures must be available to the industrial hygienist. An excellent example of progress in the analytical field, Dr. Schrenk stated, is the spectacular advance in gas chromatography. He pointed out also the rapid expansion in the fields of spectroscopy, photometry, electroanalytical chemistry, nuclear magnetic resonance, and polarographic instrumentation, and the many contributions in the more conventional analytical field.

"A knowledge of these new developments is essential in the development of the more practical instruments which are in day-to-day use in the field," he said.

"The true value of analytical tools depends upon our ability to interpret the results of such measurements in terms of a quantitative relationship with harmful or objectionable effects. This in turn requires a knowledge of the biological response to offending agents," Dr. Schrenk said.

Thus, the industrial hygienist cannot work alone in protecting the health of workers and consumers. "Laboratory studies of biological response serve the dual purpose of providing data for establishing standards and of providing better diagnostic

(Cont. on next page)

carborundum for sanding in the shoe industry; and slate or chalk for stone-dusting in c mines. Quartz sands have been prohibited since 1938 in grinding of glass, and exposur has been regulated. The higher cost of artificial abrasives in the glass and ceramic in tries is offset by higher working speed. -- Cond. from Bull. Hyg

503 Respiratory Symptoms and Pulmonary Disability in an Industrial Town. Survey of a Random Sample of the Population. I. T. T. Higgins, P. D. Oldham, A. L. Cochrane, and J. C. Gilson. Brit. Med. J. 2, 904-910 (Oct. 20, 1956).

In 1954 the Pneumoconiosis Research Unit of the Medical Research Council carried out a survey of the male population aged 55-64 of Leigh in Lancashire, in order to compare the prevalence of respiratory symptoms and disability in miners with that found in men who had worked only in other occupations. The random sample consisted of 135 miners and ex-miners and 85 non-miners. Pneumoconiosis was found in 23% of the miners and ex-miners. Chronic bronchitis was found in 10.7% of the non-miners, in 26.7% of the miners without pneumoconiosis, and in 12.9% of the miners with evidenc of pneumoconiosis. Some of the conclusions are: (1) miners and ex-miners had significantly more chronic bronchitis, a lower ventilatory capacity, and more respiratory symptoms than men who had never worked in mines; (2) miners without pneumoconiosis were on the average more disabled than those with early simple pneumoconiosis; and (3) the differences between miners and non-miners could not be ascribed to differences in social class or smoking habits, and in the miners there was no obvious relationship between length of exposure to dust and bronchitis. -- Cond. from Bull. Hyg.

504 The Influence of the Shape of Dust Particles on the Rate of Phagocytosis in Vitro. A. Lengerova, V. J. Lenger, M. Esslova, R. Tuscany, and M. Volfova. Brit. J. Ind. Med. 14, 43-46 (Jan. 1957).

The rate of phagocytosis of two shapes of dust particles—"long" and "round"—was studied in an investigation in vitro in cultures of macrophages from the spleen of chicken embryos. The round particles were phagocytosed preferentially. This result is discussed from the standpoint of existing theories of phagocytosis as well as from that of the relation of the rate of phagocytosis and the harmfulness of different kinds of dusts. -- Authors' summary

505 The Prevalence of Tuberculosis at Necropsy in Progressive Massive Fibrosis of Coalwork D. Rivers, W. R. L. James, D. G. Davies, and S. Thomson. Brit. J. Ind. Med. 14, 39-42 (Jan. 1957).

One hundred fifty-three cases of coalworkers' pneumoconiosis were examined at necropsy for the presence of tubercle bacilli both by culture and by animal inoculation. The series contained 118 cases of progressive massive fibrosis which were the special object of this study. Tubercle bacilli were isolated from 41 cases (35%) of massive fibrosis, and in 31 (28%) of these naked-eye or histological evidence of tuberculosis was recognized patho logically. The pathological observations, therefore, correlated well with the bacteriologica results. There is a marked difference between the prevalence of tuberculous infection found in a post-mortem series and that found in life in cases of progressive massive fibrosis. During life the observed prevalence is only 1.1%. The authors found tubercle bacilli in the bronchi at necropsy in 28%. Thus open tuberculosis is, in most cases, a late complication of massive fibrosis. Whether tuberculous infection occurs early or late cannot be deduced from this study. -- Authors' summary

506 Pulmonary Tumors in Mice Exposed to Asbestos Dust. K. M. Lynch, F. A. McIver, and J. R. Cain. Arch. Ind. Health 15, 207-214 (Mar. 1957).

Mice of a selected strain (AC F_1) were exposed to a dusty atmosphere containing asbestos floats of a type used by others experimentally, at 150 to 500 million particles per cubic foot. The largest single experimental group consisted of 127 animals killed at 19 months after exposure for 17 months. This group was compared with 222 control animals. Primary lung tumors were demonstrated microscopically in 46% of the dusted mice and in

36% of the controls. Multiple pulmonary tumors were demonstrated in 18% of the dusted animals and in 8% of the control animals. No significant histologic or cytologic difference was observed between tumors in the two groups. No clear-cut proof of malignancy was found in any of the lung tumors studied. The authors have been unable to demonstrate any proof of the carcinogenicity of asbestos under the conditions of the experiment, but the increased incidence of multiple lung tumors in dusted animals must be regarded as a possible accentuation by the inhalation of asbestos dust of an existing tendency to develop lung tumors. Future experiments with asbestos should include the use of larger animals, probably monkeys. The equivocal nature of this report does not answer the questions raised by accumulating clinical evidence that asbestosis is strongly associated with, and therefore is a possible cause of, pulmonary carcinoma in man. -- Adapted from authors' summary

507 Calcification of the Pericardium Caused by a Hitherto Unrecognized Etiological Factor. M. Kleinfeld and C. P. Giel. Am. Heart J. 52, 899-904 (Dec. 1956).

In a clinicoroentgenologic study of workers employed in talc mills and mines, calcification of the pericardium was observed in 3 of 37 workers. In one patient the condition had existed for 15 years. The advanced age of these patients (79, 68, and 64 years) is in contrast to that found in chronic constrictive pericarditis, where the age range reported has varied from 10 to 59 years. Cardiac enlargement was absent, and the electrocardiographic patterns were essentially normal. The clinical picture revealed a chronic, slowly progressive course, with the predominant symptoms of pulmonary insufficiency consistent with the average course of talc pneumoconiosis. The normal electrocardiograms, lack of evidence of failure of either side of the heart, lack of response to nitroglycerin, and the absence of any intensifying effect of effort would tend to exclude angina pectoris. The exact mechanism responsible for the calcification of the pericardium in exposure to talc is not known. It can best be explained by a mechanical effect of the talc fibers resulting in a chronic inflammatory response and increased capillary hemorrhage with subsequent calcium deposition. -- Cond. from J. Am. Med. Assn.

508 Dust Exposures During Ash Removal from Incinerators. W. H. Megonnell, J. H. Ludwig, and L. Silverman. Arch. Ind. Health 15, 215-222 (Mar. 1957).

Dust exposures to the operator during ash removal are not excessive for the average institutional-type incinerator, as the stack draft through the open furnace doors draws most of the dust produced by the operation back into the incinerator. Installations with small stacks, or when reverse flow is created by wind action, produce higher and more persistent dust concentrations. Incinerator operation is poorer during rainy weather. Only minor dust exposures are produced when water quenching of the ash is used, and wetting is advisable when it can be accomplished. Airborne dust in incinerator rooms is of the same general composition as the ash. It is composed of a high percentage of small particles (50% less than 0.5 micron), with larger particles which are predominantly aggregates. Exposure period for operators removing ash is a function of the degree of cleaning accomplished and the quantity of ash removed. Stack draft and room ventilation appear to be the most important factors in limiting the concentration of airborne dust in the incinerator room. A large proportion of the dust exposure incidental to ash removal could be eliminated by careful disposal cans to take advantage of the effect of stack draft and by care in depositing ashes from the shovel into containers. Obviously the furnace door and grate opening should be kept open throughout all cleaning in the incinerator room. -- Cond. from authors' summary

509 Changes in Lungs of Experimental Animals after Intratracheal Introduction of Mineral-Wool Dust. V. A. Grimailovskaya and others. Gigiena i Sanit. 21, No. 8, 24-29 (1956). Russian.

Mineral-wool dust with relatively low free silica and moderate contents of bound silica produces in rats after 2-3 months a moderate sclerosis of diffuse and nodular types; after 5 months a peribronchial sclerosis starts. This is caused by solubility of dust particles in the lymph. -- Chem. Absts.