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ABSTRACT OF THE LITERATURE OF INDUSTRIAL HYGIENE AND TOXICOLOGY

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GENERAL

INDUSTRIAL HEALTH ACTIVITIES OF GOVERNMENT. *J. G. Townsend. J. Indiana State Med. Assn., vol. 38, pp. 373-376 (Oct., 1945).*

Government shares with industrial management, labor, and the medical profession the responsibility for industrial health protection. The task of government is to stimulate and initiate work in industrial health, to carry on the basic research and surveys out of which standards are formulated, and to investigate dangerous plant conditions and recommend remedial measures. There are many agencies of the federal government concerned with industrial health; this paper concerns itself with two departments of the United States Public Health Service, the Industrial Hygiene Division of the Bureau of State Services and the Industrial Hygiene Research Laboratories of the National Institute of Health. The policy and approach of the Public Health Service has been to aid industry in the solution of its own problems. Not until the passage of the Social Security Act and the various state occupational disease compensation laws was the backlog of information given practical application in industry. Increasing concern for industrial hygiene and the wartime conditions have made the role of these agencies and their many pertinent sections and units more important and valuable. And one of the most important of these services has been to State Agencies in the form of funds, personnel, and information. For the postwar period two of the many objectives need emphasis, the training of more industrial hygiene personnel and the increase in the basic research on new and proposed industrial processes and materials.—*Weldon W. West.*

continue its work in the rapidly expanding industries. Its ranks were bolstered by the addition of a few practitioners, many nurses and some lay technical aides. This period has served to swell the importance of maintenance of health over repair of injury and to advance the specialty in many other realms. The art of administration of a variety of personnel and the science of job placements have grown. Preplacement chest X-rays and serology and mass health surveys have become important parts of industrial medicine. Phases of new importance have been met and developed, such as; Women in industry, long working hours, ailments from repetitive movements, management of health, and returning war veterans. The need for standing orders for nurses has been solved. Dermatitis, still the number one industrial problem was fairly well controlled with existing techniques, but demands more study. A code of ethics for industrial practice has been formulated which concerns among other things the problems of non-industrial cases and referral to private practice. Periodic examinations and health education have suffered relatively because of reduced time and personnel. However, the advantage of individual health instruction has been made evident. Inspection of cafeterias in industry was not new but has become of greater stature in industrial health management. Likewise the consideration of the mental health of the workers promises to grow in the future. Finally, the war has given industrial physicians the opportunity to better their professional, industrial, and economic positions, but at the same time has emphasized the need for special preparation and training.—*Weldon W. West.*

THE WAR'S IMPACT AND INFLUENCE ON INDUSTRIAL MEDICINE. *C. D. Selby and Earl F. Lutz. J. Indiana State Med. Assn., vol. 38, pp. 378-381 (Oct., 1945).*

World War II found industrial medicine ready to con-

INDUSTRIAL HYGIENE. *Irving R. Tabershaw. New England J. Med., vol. 233, no. 15, pp. 437-443 (Oct. 11, 1945).*

This article is a review of recent developments and

by the physician of nutritional deficiency diseases and their symptoms, are suggested to meet the problem described by Dr. Riggins—Weldon W. West

THE IMPROVEMENT IN NUTRITION AS PROTECTION AGAINST INDUSTRIAL TOXICITY. *Mulbank Mem Fund Quarterly*, vol. 23, pp. 97-108 (Jan., 1945).

The importance of adequate and well balanced nutrition on maximum work production, mental and physical alertness, nervous equilibrium, and general well being, is now well known, but its bearing on resistance to toxic environment has not yet been sufficiently investigated and certain deductions must be made largely by analogy. These deductions have a certain amount of scientific background in animal experimentation and certain empirical evidence has been found in human beings. Various poisons are listed, with the physiological areas affected and the dietary factors needed for prevention and treatment: benzol, trinitrotoluol, carbon tetrachloride, hydrofluoric acid, lead, nickel, carbon bisulfide, tetrachloroethane and selenium—*Ind Hyg Found.*

SHOULD LESS PROTEIN BE EATEN DURING HOT WEATHER? *Anonymous: Nutritional Observatory*, vol. 6, pp. 7-8 (Jan., 1945).

The long-believed statement that the specific dynamic action of protein is greater than that of carbohydrates and fats, and that, therefore, we should eat less protein

in hot weather, has been disproved by Forber and Smith (J. Nutrition, 27, 453-468 (1944)). By experiments made upon rats it was found that the specific dynamic effect of individual foods are without significance as constants and therefore there is no scientific means of apportioning energy effects or values among dietary constituents.—*Ind Hyg Found.*

SALT TABLETS IN HOT WEATHER OVERRATED C. G. King. *Food Field Reporter*, vol. 13, pp. 28, 34 (Feb. 5, 1945).

In a broadcast to China and the South Pacific under the auspices of the Office of War Information dealing with the recent progress in nutritional science in the United States, Dr. King said that increased consumption of salt in hot weather is of much less significance than was formerly believed. The earlier reports of supposed benefits from extra salt were largely misinterpreted, because the pains that were observed were caused chiefly by the increased water intake which the salt had caused. The practice of giving salt tablets may even cause nausea and vomiting. About 10 grams of salt per day, as supplied in ordinarily seasoned foods, is adequate to meet one's needs for a long period. Several other fields of recent food research were also discussed, including the discovery that the protein intake must be kept relatively low for people in high altitudes, as in aviation or on mountain heights.—*Ind Hyg Found.*

SYSTEMIC AND INFECTIOUS OCCUPATIONAL DISEASES, AND HAZARDS

DISCUSSION ON MODERN CONCEPTIONS OF INDUSTRIAL LUNG DISEASES. *Proc Roy Soc Med*, vol. 38, no. 9, pp. 518-524 (July, 1945).

Dr. Sutherland discusses the development of the radiographic diagnosis of industrial pneumoconiosis, and gives a summary of current knowledge of their etiology and pathogenesis. The two most important are asbestosis and silicosis, of these, the second is the more important since the number of occupations involving exposure to dusts containing free silica (SiO_2) is very large. In addition, exposure to dusts containing silicates or other substances, with some free silica, produces effects differing from those of exposure to free silica. Linear scarring or increased arborization on X-ray seems to be the precursor of the classic nodular silicosis, the long period of development of the latter bears out the point that the major factor in the prognosis of silicosis is still the presence or development of tuberculosis.

Coal miner's pneumoconiosis has increased in frequency recently because of the increased intensity of exposure, and is now a compensable illness under the definition of pneumoconiosis as "fibrosis due to silica dust or other dust and includes the condition of the lungs known as dust reticulation." The clinical significance of dust reticulation is still doubtful, a more advanced phase, nodulation, may be the result of class-

ical silicosis, mixed silicosis, or of extension of the process causing reticulation. The most advanced form, massive fibrosis with emphysematous bullae, has been ascribed to selective blockage of lymphatics with excessive deposition in one area, to coalescence of nodules, and to associated tuberculosis. The prognosis of this stage is poor.

Radio-opaque metallic dusts cause a fibrosis with apparently no clinical significance unless there is associated silicosis, asbestosis seems to be due to the size and shape of the asbestos fibers rather than to any other factor, since finely ground asbestos does not produce the condition.

Dr. Fawcett discusses the radiologic classification of the various lung pictures seen in pneumoconiosis, and the differential diagnosis of the various stages. Radio-opaque dusts, such as hematite, cause a reticulation persisting long after exposure has ceased; a more advanced stage of apparent nodulation is the chief cause of difficulty in diagnosis of the condition, and is closely simulated by miliary tuberculosis, secondary carcinoma, and penicillium infection, for example. More advanced nodulation and the massive fibrosis of silicosis may be simulated by tuberculosis, carcinoma, bronchiectasis, and various mycoses, calcified lesions may suggest hydatid or chondroma.

Dr. Craw presents chemical analyses and contact

rays demonstrating that the reticulation of hematite miners is due only to dust, and not to fibrosis, that large nodules occur only in the presence of tuberculosis, and that silicosis occurring in the lungs of hematite miners is related to the total amount of silica dust inhaled.—B. H. Landing.

SILICOSIS IN FOUNDRIES OF NAVAL GUNBOATS. *Riley, R. W. Butler and S. Green. J. Ind Hyg Bull.*, vol. 44, pp. 653-659 (March, 1944). In May, 1944, at the United States Navy Yard of the Washington Navy Yard a survey of the steel and nonferrous foundries of the detection of silicosis and tuberculosis. In the steel foundries, 15 of stage 1, 1 of stage 2, and one of stage 3, an incidence of 2.5% of tuberculosis were discovered. In the nonferrous foundries, 15% of tuberculosis were discovered. Within the past three years various measures have been instituted. The incidence of silicosis has been reduced by the fact that present dust levels are approximately 65% lower than previous levels. It is thought that although the silicosis rate in the foundry has not been eliminated, it has been considerably decreased, and the likelihood of new cases or further aggravation of existing cases in these foundries is minimal.—Summary.

THE USE OF ALUMINUM IN SILICOSIS. *R. Tabershaw and Bernard D. Tatters. J. Ind Hyg Bull.*, vol. 44, no. 9, pp. 709-711 (September, 1944). At present, inhaled aluminum is the only known to give relief to silicosis. Both metallic aluminum and amorphous aluminum are used. They localize in the lungs and therefore prevent further silicosis. The inhalation of aluminum has a very mild effect and has no toxic reactions except that it stimulates the body's defense to tuberculosis.

Aluminum should be used therapeutically in those workers exposed to silica dust, diagnosed as pre-silicosis, and even in those with active tuberculosis may be treated if the condition is not advanced. Aluminum may also be used in those workers exposed to silica dust, who should be examined and watched for the development of such a program has not been determined. Individuals with active pulmonary ailments, or advanced cardiac ailments, should not be treated with aluminum. For a complete discussion of the use of aluminum should be made by a physician; initial and periodic X-ray examination should be made to determine the response to treatment, and the progress of the disease; and engineering methods to control the environment should be continued.—R. H. Land, Jr.

been disproved by Forbes and Smith (453-468 (1944)). By experiment it was found that the specific dynamic action of foods are without significance; therefore there is no scientific means of determining effects or values among diets. *Hyg. Found.*

NOT WEATHER OVERRATED. *Chemical Reporter*, vol. 13, pp. 28, 34 (Feb. 1945).

China and the South Pacific under the Office of War Information deal with progress in nutritional science in the King said that increased consumption of weather is of much less significance than believed. The earlier reports of the extra salt were largely mistaken. It was found that the salt intake was less than that which the salt tablets were giving. About 10 grams of salt in ordinarily seasoned foods is sufficient for a long period. Several food research were also discussed, and it was pointed out that the protein intake must be increased for people in high altitudes, as in certain heights. *Ind. Hyg. Found.*

DIS AND HAZARDS

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chemical analyses and control

X-rays demonstrating that the reticulation seen in the lungs of hematite miners is due only to the hematite dust, and not to fibrosis, that large-sized nodulation occurs only in the presence of tuberculosis, and that any fibrosis occurring in the lungs of hematite-miners is not related to the total amount of silica or hematite in the lungs. *B. H. Landing.*

SILICOSIS IN FOUNDRIES OF NAVAL GUN FACTORY. *E. M. Riley, R. W. Butler and S. Goren. U. S. Naval Med. Bull.*, vol. 44, pp. 653-659 (March, 1945).

In May, 1944, at the United States Naval Gun Factory of the Washington Navy Yard a survey on 842 employees of the steel and nonferrous foundries was made for the detection of silicosis and tuberculosis. Eighteen cases of silicosis were found, 15 of stage 1, two of stage 2 and one of stage 3, an incidence of 2.12%. Thirteen cases of tuberculosis were discovered, an incidence of 1.54%. Within the past three years various protective measures have been instituted. Their efficacy is attested by the fact that present dust counts average approximately 65% lower than previous figures. It is thought that although the silicosis hazard in the Navy Yard Foundry has not been eliminated, it has been appreciably decreased, and the likelihood of the development of new cases or further aggravation of existing cases in these foundries is minimal. *From authors' summary.*

THE USE OF ALUMINUM IN SILICOSIS CONTROL. *Irving R. Tabershaw and Bernard D. Tebbens. Indust. Med.*, vol. 14, no. 9, pp. 709-711 (September, 1945).

At present, inhaled aluminum is the only medication known to give relief to silicosis. Both finely divided metallic aluminum and amorphous hydrated alumina are used. They localize in the lung, neutralize silica, and therefore prevent further pathological processes. The inhalation of aluminum has a very prolonged effect and has no toxic reactions except that it may lower the body's defense to tuberculosis.

Aluminum should be used therapeutically in all those men exposed to silica dust, diagnosed as having silicosis, or diagnosed as pre-silicotics, and even those with inactive tuberculosis may be treated if kept under rigid observation. Aluminum may also be used prophylactically in those workers exposed to silica hazards. These men should be examined and watched carefully as the usefulness of such a program has not yet been fully determined. Individuals with active tuberculosis, pulmonary ailments, or advanced cardiac disease should not be treated with aluminum. For a successful program the use of aluminum should be in charge of a qualified physician; initial and periodic X-ray and physical examination should be made to determine the need and response to treatment, and the progression or recession of the disease; and engineering methods for controlling the environment should be continued. *Elwood F. Ireland, Jr.*

MEDICAL ASPECTS OF PARTIAL DISABILITY IN SILICOSIS.

George W. Wright. Transactions, Legal Section, Ninth Annual Meeting, Indust. Hyg. Found., Bull. no. 2 (Nov. 16, 1944).

Discussion of this subject is pertinent because of a widespread interest in the problem on the part of the legislators of several states.

Administration of the now existent total disability law reveals certain difficulties which would likely be magnified in an attempt to assess partial disability and prove its causal relationship to silicosis.

Silicosis produces disability chiefly by reducing one's capacity to breathe, hence limiting one's range of physical exertion. Partial disability may be said to exist when this reduction is not totally disabling but is more pronounced than is to be expected in view of the claimant's age. The assessment of slight to moderate disability would be difficult because the range of variation in the capacities of normal men is large and no methods exist for accurately predicting what should be normal for a given man.

To determine partial disability in the zone approaching total disability would also be difficult because the values for respiratory capacity that are characteristic of total disability are not adequately defined. There is a zone of partial disability between these extremes which is definable but to divide it into degrees would be to assume a non-existent discriminatory capacity.

To show a causal relationship between silicosis and disability is often difficult even when the disability is complete because the failure of other organs, such as the heart and kidney, will simulate the symptoms of disability due to silicosis. As lesser grades of disability are considered, this problem becomes much more complex because of the lack of methods to estimate adequately the reserves of the kidney and cardiovascular systems.

The symptoms of respiratory failure due to silicosis, of heart failure and in some respects of kidney failure, are all very similar and at times indistinguishable. The fact that undoubted objective evidence (X-ray) of silicosis precedes the earliest symptoms of pulmonary failure due to that cause, while the earliest symptoms of heart and renal failure nearly always precede unquestioned objective evidence of disease in these structures, makes for a tendency to ascribe all symptoms in a silicotic to the co-existent pathological process in the lung. To do so is often erroneous and in mild degrees of disability this source of confusion would be very difficult to overcome.

The author believes that insufficient data exists at this time to permit completely adequate administration of partial disability law in silicosis. Avenues of investigation are indicated from which data might be obtained which would allow such a law to be equitably conducted. *Trudeau Found.*