



FOUNDATION FACTS

This news-letter is issued monthly to member companies and trade associations affiliated with Air Hygiene Foundation. Its purpose is to report Foundation news and activities. Air Hygiene Foundation is a partnership of industry and science organized to protect the health of the 15 million workmen in heavy industry.

Vol. I.

September, 1939

No.

Are You Missing Any Bets?

A safety engineer in a company affiliated with Air Hygiene Foundation was recently obliged to design some exhaust equipment. He spent much time and effort looking up data, none of which proved very helpful. After the installation was completed -- with considerable difficulty -- the engineer chanced upon two of the Foundation's engineering bulletins, "Design of Exhaust Hoods" and "Design of Duct Work for Exhaust Systems." He complained:

"Why didn't somebody tell me about these bulletins?"

"Why they're exactly what I wanted!"

The bulletins were available in his organization all the time, gathering dust on someone's shelf. The engineer didn't know such bulletins existed, didn't know his company was a member of the Foundation, didn't know what services the Foundation affords.

Costly cases such as this are all too common. Dr. H.B. Meller, Managing Director, urges Foundation members to "cash in" on the value of their memberships. Inform all interested individuals in your company of your membership in Air Hygiene Foundation and the services they can derive through this membership. A circular describing these services is enclosed. Additional copies are available for distribution through your organization, for bulletin board posting, etc. Incidentally, do you have a complete file of Foundation bulletins? Publication lists are furnished upon request. (See July issue INDUSTRIAL MEDICINE, pp. 324-25, for a good account of the Foundation's activities during the past year).

Plans Progressing for Annual Meeting

Plans are progressing for the 4th annual meeting of Air Hygiene Foundation to be held at Mellon Institute, Pittsburgh, November 14-15. The wealth of important information for presentation forces expansion of the program from a one-day to a two-day conference this year. The program is being keyed to the theme, "Healthy Workmen Make for Healthy Business."

Technical data include: Reports on Foundation's engineering research at Harvard by Philip Drinker, Chairman of the Preventive Engineering Committee; reports on Foundation's medical research at The Saranac Laboratory and University of Pennsylvania by Dr. L.U. Gardner and Dr. E.P. Pendergrass, respectively. Reports on latest developments in employee health protection by Dr. A.J. Lanza, Chairman of Medical Committee. Dr. Lanza will also preside at a symposium on absenteeism which will develop measures for use of member companies in reducing lost time through illness.

On the managerial side, Andrew Fletcher, Vice President of St. Joseph Lead Company, will point out specific dollar-and-cents savings resulting from proper health precautions. V.P. Ahearn, Executive Secretary, National Industrial Sanitation Association, is to preside at a forum designed to show the importance of employee health in all employer-employee relationships, the impact of health on labor and community relations. Theodore C. Waters of the Foundation's Legal Committee will discuss legal trends and developments of 1939 affecting industrial hygiene.

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Air Hygiene Foundation of America, Inc.,
4400 Fifth Avenue,
Pittsburgh, Pa.
September 13, 1939

NWBB-0008081

REFERENCES TO RECENT LITERATURE ON INDUSTRIAL DISEASES

(A) News Items

- 621 FOURTH SILICOSIS SYMPOSIUM. ABSTRACTS OF PROCEEDINGS OF THE FOURTH MEETING AT SARANAC LAKE, N.Y., JUNE 19-23, 1939. Industrial Medicine, 8, 354-61 (August 1939).

The Fourth Silicosis Symposium covers a broader scope than the former meetings, including medical and engineering phases of silicosis generally, followed by results of studies of various types, and concluding with the discussion of the administrative, insurance and compensation aspects of the subject. Excellent abstracts of the various papers appear in the above issue of Industrial Medicine and those interested in the subject are referred to that publication. The proceedings of the meeting, to be published later in the year, will make a valuable addition to any industrial hygiene laboratory. More detailed information as to the date of publication, address at which to obtain it, and price will be given in next month's abstracts. Complete abstracts of all papers will also be given here upon printing of the proceedings.

- 622 THIRD ANNUAL SYMPOSIUM, DEPARTMENT OF INDUSTRIAL MEDICINE, NORTHWESTERN UNIVERSITY MEDICAL SCHOOL.

The Department is conducting its Third Annual Symposium on Industrial Disease and Hygiene on September 25 and 26, 1939, at Thorne Hall, Chicago Campus. Registration is limited to physicians, industrialists, safety engineers, hygienists, personnel and industrial relations managers. The scientific sessions include discussions of the following subjects: non-tuberculous pulmonary diseases, kidney diseases of mid-life, soap as an agent in industrial dermatitis, welding--gas and electric, and a discussion of common beneficial uses of some poisonous metals and alkaloids. All the speakers are well known authorities in their fields. The registration fee for the two-day scientific program is \$5.00 with an additional \$3.50 for the banquet session at the end of the meeting.

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

- 623 CLAUDE BERNARD'S WORK ON EXPERIMENTAL PNEUMOCOCCIOSIS. G. Rosen. Bull. Hist. Med., 7, 412-16 (April 1939).

This is an interesting short paper on Bernard's experimental work in the 1850's. Bernard was unsuccessful in experiments on rabbits over whose heads he attached bladders containing coal dust. At the end of several days' exposure the animals were killed but dust particles could only be found in the nasal chambers and none were found in the larynx and there was no black pigmentation in the lungs. Bernard attributed this to the filtering action of the upper respiratory tract. As others pointed out a few years later, Bernard's animals were not exposed long enough to produce an accumulation of dust in the lungs.

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- 624 SILICOSIS PREVENTION. DUST CONTROL IN FOUNDRIES. Division of Labor Standards, U.S. Dept. of Labor Bulletin (No Number) 25 pp. (1939). For sale by Superintendent of Documents, Washington, D. C. Price 10 cents.
Silicosis control in foundries can be accomplished by two methods, both of vital importance. First, preventing dust generated by industrial operations from entering the working atmosphere; accomplished by effective local exhaust, dust collecting systems, and wet methods. Second, by a number of foundry practices, including good industrial housekeeping, isolating dusty operations, and integrating dust control with production. This bulletin deals with simple, inexpensive methods and practices of dust control and does not describe elaborate systems that are now commercially available. It has been said that good housekeeping is the cheapest single effective dust-control measure. A number of operating practices are given which, if carried on with the dust hazard in mind, will aid in reducing foundry workers' exposure to silica dust.
- 625 PATHOLOGY OF PNEUMOCONIOSIS. W. di Biasi. Deutsch. med. Wchnschr., 65, 369-372 (1939). (German).
The author is connected with one of the largest hospitals in the Ruhr coal mining area and has had a very wide experience. He stresses the fact that so far as we know, coal dust does not cause fibrosis: the so-called anthracotic fibrosis is either a silicotic fibrosis rich in coal dust or is scar tissue of other origin, loaded with coal dust. Also there is not sufficient evidence that silicates produce fibrotic tissue. The author continues with a description of the pathological and anatomical alterations following inhalation of quartz dust and a statement regarding their development. It is important to realize that early silicosis can develop without further exposure, although it may do so very slowly. An example is cited of a man dying of silicosis 20 years after exposure had ceased. This is explained by the fact that colloidal silicic acid is gradually evolved from tiny dust foci, and then leads to silicotic changes.
- 626 SILICOSIS, A CLINICAL AND ROENTGENOLOGICAL STUDY. A. Bernard-Silorata. Rass. Med. Industr., 10, 73-117 (February 1939). (Italian).
Case histories of 19 male workers with varying degrees of infection are given, with an account of the various difficulties of interpretation and diagnosis of the pulmonary lesions, all or a part of which were caused by inhalation of silica dust. The kind and duration of the patients' work is commented upon in connection with the x-rays. Most interest is centered on the cases of silicosis with tuberculosis. The author points out the possibility that less advanced cases may be confused due to the term used "silicosis with infection" and suggests that "silicosis with danger" or "silicosis without danger" would be preferable.
- 627 QUANTITATIVE SPECTROGRAPHIC DETERMINATION OF SILICON IN THE BLOOD. C. Richter. Arbeitsschutz, 141-144 (1939). (German).
The author describes carefully the analytical procedure. She examined the blood of 30 persons, 12 young men of various occupations, 7 invalid silicotic miners, 4 other silicotic miners and 7 other workers of whom 4 were silicotic. The silicon content found was somewhat higher than that heretofore reported--8 to 28 mg. silicon per 100 cc. blood--and was a little lower in the silicotics than in the others. The author adds that additional work is needed.
- 628 SPONTANEOUS PNEUMOTHORAX IN ANTHRACOSILICOSIS. M. F. Sokoloff and J. T. Farrell, Jr. J. Am. Med. Assoc., 112, 1564-66 (April 22, 1939).
The authors compare the incidence of spontaneous pneumothorax (the presence of air or gas in the pleural cavity) in simple and in complicated pneumoconiosis. Of 507 anthracite coal miners, all incapacitated by chronic pulmonary disease and all having anthracosilicosis, 308 (60.7%) had a coexistent tuberculosis; one

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had a metastatic pulmonary carcinomatosis; and 199 were uncomplicated. In the entire series of cases studied, 22 cases of spontaneous pneumothorax (4.3%) were found, 8 having second- and 12 third-stage anthracosilicosis. Fourteen occurred in association with tuberculosis. Seven were found among those having simple pneumoconiosis, and one in the case with carcinoma. Intense dyspnea, a sense of impending suffocation, severe pain in the chest, a feeling of constriction on the affected side and shock were symptoms present in many cases; small collections of air produced no symptoms and the condition was discovered only by routine x-ray. Roentgenologically, the condition must be distinguished from emphysematous blebs and pulmonary cysts. While emphysema, bleb formation, and pleural adhesions are always present in anthracosilicosis and are factors which greatly favor the development of pneumothorax, and while the frequent coexistence of tuberculosis and the severe accompanying cough further predispose to pleural accidents, this effect is greatly decreased by the always present thickened visceral pleura which resists tearing or perforation and thus offers an actual protection against the formation of pneumothorax. This explains the low incidence of pleural perforations (4.3%) in this group of anthracite coal miners with anthracosilicosis.

- 629 MULTIPLE GIANT BULLAE ASSOCIATED WITH ANTHRACOSILICOSIS. E.R. Wiesa, C.A. Heiken and Robert Charr. Am.J. Roentg. & Radium Ther., 42, 186-91 (August 1939). A case is presented of multiple giant bullae (large blisters or vesicles filled with fluid) of the lung associated with anthracosilicosis which was observed by the authors over a period of several years. They believe the case to be unique because of the multiplicity and the size of the bullae, which could readily have been mistaken for spontaneous pneumothorax. Diagnosis was confirmed by gross post-mortem findings and microscopic examination. The importance of differential diagnosis between bullae and pneumothorax is emphasized and a discussion is given of the two conditions in connection with emphysema of the lungs.

- 630 AN X-RAY STUDY OF THE LUNGS OF WORKMEN IN THE ASBESTOS INDUSTRY COVERING A PERIOD OF TEN YEARS. A.W. George and R.D. Leonard. Radiology. 33, 196-202 (August 1939). The authors discuss some of the conclusions they have reached after an extensive experience examining asbestos workers. Each industry or occupation should be studied by itself because the hazards of each vary greatly. The most important variable with occupation is the percentage of free silica in the dust which can cause the development of a silicotic condition in addition to the asbestotic one. The authors are of the opinion that asbestosis is not a progressive disease after the individual has been removed from the dust hazard. They found also that the disease has no causal relation to tuberculosis. Unlike silicosis, X-ray appearance of tuberculosis and asbestosis are quite different. They found no clinical findings pathognomonic of asbestosis and state that diagnosis of asbestosis must depend alone on X-ray evidence.

- 631 PULMONARY ASBESTOSIS. V. A REPORT OF BRONCHIAL CARCINOMA AND EPITHELIAL METAPLASIA. K.M. Lynch and W.A. Smith. Am. J. Cancer. 36, 567-73 (August 1939). The authors present the case history of a patient with pulmonary asbestosis and carcinoma and, in addition, make a contribution to the statistics on the incidence of carcinoma and asbestosis. During the past 12 years in 2343 consecutive necropsies (38 cases of asbestosis among them) the incidence of carcinoma was 0.30%. Omitting the asbestosis cases the incidence was 0.21%. Among the asbestosis cases (35 in number) the incidence was approximately 6% (2 cases), but the statistical value of these figures is questionable because of the small numbers. The authors also note the observation that advanced asbestosis may lead to bronchial epithelial metaplasia of a type encountered in other locations where cylindrical epithelium may give rise to squamous-cell carcinoma.

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References to Recent Literature - 4

- 632 ASBESTOSIS. E.W. Baader. Deutsch. med. Wchnschr., 65, 407-408 (1939). (German). A short but excellent description of the origin, clinical aspects and diagnosis of pulmonary asbestosis. Asbestos warts and lung cancer of asbestos workers are discussed. It is comparatively rare to find asbestosis complicated by pulmonary tuberculosis in Germany.
- 633 TUBERCULOSIS IN INDUSTRY. A.R. Riddell. Canadian Pub. Health J. 30, 156-160 (March 1939).
The author concludes that "although the relation of certain occupations to the occurrence of tuberculosis is somewhat disquieting, industry in general does not constitute a menace in this respect." He states that "industrialization has so raised the general standards of living as to more than counteract any adverse influence which specific industries exert." Insurance reports indicate a higher death rate among industrial as contrasted with non-industrial groups in the same community. The influences which may exert an adverse effect on an industry's tuberculosis rating are discussed, particularly posture and overcrowding. The results of surveys of overcrowded plants are revealing. The importance of tuberculosis in relation to silicosis is illustrated by observations on a series of 375 cases which occurred in Ontario during the past 10 years and one group in one of the northern mining camps, where the transmission of tuberculosis to contacts was particularly noted. The economic aspect of tuberculosis exerts a severe strain on the community and industry, and the results of treatment so far as the individual workman is concerned are not encouraging, few are ever again permanently self-supporting. The necessity of preventive measures for early detection of cases is pointed out. Such measures should include chest roentgenograms, supplemented by laboratory facilities.
- 634 TUBERCULOSIS AND CAISSON DISEASE. J. Am. Med. Assoc. (Queries and minor notes) 112, 1990 (May 13, 1939).
A man who had an attack of caisson disease made an almost complete recovery. At that time his lungs were normal although no roentgenograms were taken. A year later the man developed active tuberculosis. The reply states that there is no logical connection between these two conditions; it is quite possible that pre-symptom tuberculosis was present originally but not detected.
- 635 A STUDY OF THE EFFECTS OF EXPOSURE TO DUST IN THE MINING AND MILLING OF PYRO-PHYLLITE. H.F. Eason, M.F. Trice and C.C. Carpenter. Division of Industrial Hygiene, North Carolina State Board of Health and North Carolina Industrial Commission, Bulletin, 100 pp. (February 1939). For sale by the Division, Raleigh, N. C. Price 50 cents.
Pyrophyllite is a natural hydrous aluminum silicate containing 20% alumina, 74% silica--of which from 25% to 35% is quartz. It is employed in the manufacture of rubber goods, textiles, roofing paper, soap, paint, toilet preparations, and ceramic products. Exposure of workmen in mining and milling processes, which are inherently dusty occupations, constitutes a serious hazard and many of them develop a lung condition designated as pneumoconiosis. The pyrophyllite dust causes a pulmonary fibrosis which appears on the x-ray film as massive tumor-like shadows bilaterally situated in the subapical region or as granular densities throughout the lungs. Emphysema is common and nodulation rare. The pathology appears to be permanent and tends to progress. Tuberculosis is not necessarily a complicating factor. The examinations reported here cover 101 present and former employees; 35% of those with 2 years or more exposure showed evidence of lung pathology. The Bulletin also includes methods for dust control, numerous reproductions of X-rays and microphotographs and many plant and mine scenes.

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- 636 OCCUPATIONAL AND ECONOMIC FACTORS OF MORTALITY. M. Greenwood. Brit. Med. J., pp. 862-6 (April 29, 1939). (British).
This Chadwick lecture is based upon the occupational decennial reports of the Registrar-General with special reference to the last of these reports which deals with the years 1930-2. The first of the series was the work of William Farr in 1851. His successors Ogle, Tatham and Stevenson, each in his turn added something to the method and value of the reports. In the hands of Dr. Stocks the latest report contains many new and important characteristics. The primary object throughout has been to show the influence exerted by occupation upon health, as measured by mortality. Industrial diseases have thus been exposed, in particular those due to inhaling dust, of which silicosis is the outstanding example. By grouping occupations into great social classes the influence of prosperity or want is displayed; and this influence is further established now by including information about the wives of occupied men. Clearly, if both the wives and the men exhibit a similar tendency to succumb to some cause of death, we cannot fairly ascribe this tendency to some occupational exposure of the man. We have rather to study the social and geographical environment in which the wives share. Here the density factor known as housing, still plays an important part, even though less manifest than in the days of Simon and Chadwick. We have to rely even today upon mortality to measure good or evil influences, as we sadly lack information concerning morbidity, and means for correlating sickness with occupational factors.
- 637 OCCUPATIONAL MORTALITY: THE REGISTRAR-GENERAL'S DECENNIAL SUPPLEMENT, ENGLAND AND WALES, 1931. Editorial, Am. J. Cancer, 36, 110-116 (May 1939).
This editorial makes available in an American journal some of the results of the excellent study made by the Registrar-General's office. (See preceding abstract.) Tables are presented showing standardized morbidity ratios at ages 35 to 65 for cancers of various sites by sex, social class and by marital status for the females. Some of the discussions and conclusions from the original article are quoted.
- 638 DISABLING MORBIDITY AMONG EMPLOYEES IN THE SOAP INDUSTRY, 1930-34. H.P. Brinton and H.E. Seifert. U.S. Public Health Reports, 54, 1301-16 (July 21, 1939).
This paper deals with sickness and nonindustrial injuries causing disability lasting 8 calendar days or longer among persons engaged in the soap industry. The annual number of cases per 1000 was 76.0 for males, 98.1 for females, while the annual number of days of disability per person was 2.70 and 3.41, respectively. The average number of days per case was 35.5 among males and 34.8 among females. Frequency rates by occupation among males ranged from 31.6 for office workers to 134.9 for soap handlers and process laborers. High rates were associated with strenuous manual labor and low rates with white-collar and supervisory occupations.
- 639 THE AGE BREAK IN THE INDUSTRIAL POPULATION OF RECKLINGHAUSEN. H. Niewöhner. Arc. f. Hyg., 122, 1-19 (1939). (German).
The laborer reaches his working peak at 40 years. In Germany today there is a great deal of interest in this "age break" and possible methods of delaying it. It is not known how much weight to assign to natural physiological aging, and how much of the process is due to the years of hard work preceding the break. The author presents statistical material on the age breaks among miners and among persons not performing manual labor, but many of his conclusions are not well founded. If a more thorough comparison had been made with other groups, it would be found that many of his conclusions would apply to all workers and not only to miners.

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- 640 THE MEDICAL DEPARTMENT AND ITS RELATION TO OTHER PERSONNEL ACTIVITIES. H.W. Lawrence. Ind. Med. 8, 342-7 (August 1939).
Compensation laws, benefit plans, sick and accident insurance, are all bringing to the employer the realization, in a financial way, that human failure is a matter of cost in a manner very similar to machine cost. This is why the medical departments have assumed so much importance during the past few years. It is through the medical department that the best relationships can be built up between employee and employer. The medical department has a vital interest in workmen's compensation cases, in industrial and public relations, in employment and rehabilitation, in preventive activities of the safety and health department and in the training and educational departments. Industrial physicians must be well trained and capable not only in medical practice but in human relations as well.
- 641 WATCHING OVER HEALTH. A.G. Kammer. Nat. Safety News, 40, 34, 35, (September 1939).
The industrial physician makes his chief contribution toward a higher health level in the employees through complete physical examinations. A program for employee examination is proposed and described in this paper.
- 642 DUST IN CEMENT PLANTS. W. Anselm. Zement, 28, 15-21, 30-35 (1939). (German).
The discussion includes the sources of cement dust, methods of collection and precipitation, distribution of particle sizes, distances carried in normal air currents, etc. A study of the health of the cement plant workers showed that none had acquired active or inactive pulmonary tuberculosis during decades of exposure to the dust. Since cement dust does not contain free silica, but rather calcium silicates which are strongly alkaline in reaction, this dust seems to have exhibited protective effects.
- 643 THE CEMENT BURN. J. M. Meherin and T.P. Schomaker. J. Am. Med. Assoc., 112, 1322-1326 (April 8, 1939).
The author finds the literature on cement burns meager. He presents in a table an average composition of Portland cement (lime 62%, silica 22%, etc.) and concrete (gravel 35%, sand 29%, cement 8%, water 8%). The pH of cement in solution varies between 11.5 and 12. Five definite factors occur in the production of the burn: (1) abrasive action while manipulating concrete, (2) friction, (3) heat of solution, (4) marked hygroscopic action, and (5) alkaline corrosive action. Sixty cases are reported which had a total disability of 640 days, or an average of 10 days each and an average treatment of 14 days each; seven required hospitalization, of which 6 were infected although infections occurred in a total of 13 cases. Pain was the chief symptom bringing the patient to the doctor's office. Cement burns are theoretically preventable by the use of dry boots and gloves, frequently changed, showers and compulsory bathing, and the application of heavy petrolatum where practical. Treatment consists in prompt lavage with water, never with chemical neutralizers. The crust which forms is usually loosened within 24 hours by soothing ointment, leaving a fairly clean, ragged but simple ulcer. Once clean granulations appear, cod liver oil in ointment proved satisfactory.
- 644 AN ELECTRON MICROSCOPE AS AN ANALYTICAL TOOL FOR THE LOCALIZATION OF MINERALS IN BIOLOGICAL TISSUES. G.H. Scott and D.M. Packer. Anatom. Record, 74, 17-29 (May 25, 1939).
The apparatus is described and illustrated. Its principles and application to the examination of biological tissues are discussed.

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- 645 DETERMINATION OF THE FINENESS OF PORTLAND CEMENT. NOTES ON THE WAGNER TURBIDIMETER. T.W. Parker and R. W. Nurse. J. Soc. Chem. Ind., 57, 436-438 (1938). (British).
The authors describe some modifications of the American Wagner turbidimeter apparatus and methods. The British Standard sieve No. 300 (separation at 70 microns) is used with 1.0 gm. of cement and 250 cc. of kerosene in the determination of sieve residue. In the preparation of the suspension 0.3 mg. of cement is made into a paste with 5 drops of oleic acid and 5 drops of kerosene on a polished porcelain tile, then made up to the standard volume with kerosene; a mechanical rotary shaker for the settlement cell is substituted for manual shaking; a Cambridge Unipivot microammeter with a range of 0.60 microamperes is used in the determination of the turbidity. A standard sample of cement obtained from the Bureau of Standards showed a specific surface of 1890 sq.cm. per gm. by the above modified method, as compared with 1900 reported by the Bureau.
- 646 DETERMINATION OF THE SPECIFIC SURFACE OF POWDERS. II. P.C. Carman. J. Soc. Chem. Ind. 58, 1-7, (1939) (British).
The permeability method for specific surfaces of powders is shown to give an accuracy of 5% on particles down to an average size of 2-3 microns, independent of their shape and size distribution. The limitations of the method and its merits compared to alternative methods are discussed. The method was previously described by the author in the first paper of the series, noted in Abstract 35, 1939. It is the only one of the available methods which gives accurate measurement of small size particles, the size range which makes the largest contribution to numbers and total surface of powders or dusts.
- 647 CLEANING AND STERILIZING GOGGLES AND RESPIRATORY EQUIPMENT. National Safety Council, Industrial Data Sheet No. D. Gen. 16. Nat. Safety News, 40, 38 (August 1939).
The principal hazards of unclean equipment are infection, dermatitis and rashes due to contact with the contaminated surfaces. Cleanliness insures the prevention of these conditions and insures proper operation of valves, filters, screens, etc. The method recommended in cleaning material of rubber, metal, plastic, textile, leather or fabric construction is scrubbing in a warm soap and water solution. The use of solvents such as carbon tetrachloride, gasoline and naphtha is not recommended. Several methods of sterilization are suggested, the one to be followed depending on the type of material. A number of other pertinent suggestions regarding the use and care of respirators is included.
- 648 ABC'S OF INDUSTRIAL DUST CONTROL. PART II. TYPES OF PROBLEMS ENCOUNTERED. Roy P. Warren. Occupational Hazards and Safety, 1, 11-3 (August 1939).
Regarding reasons for the installation of dust control equipment, industry might be divided into two groups: first, those to whom the search for dust control is retroactive, or who have suffered financial loss from litigation, fires, explosions; second, those desiring only increased quality, reduction of losses or gain in operating facilities. It is pointed out that the reasons of those in the second group are just as important and beneficial as those of the first group. The great increase in the installation of dust control equipment has been due in a large measure to the realization on the part of management that the equipment usually pays for itself by one means or another.
- 649 AN ALL-CLASS FLOWMETER WITH INTERCHANGEABLE ORIFICES. Chem. & Indus., 58, 514-515 (May 27, 1939). (British).
Describes and illustrates a flowmeter of detailed construction that is easily cleaned and filled.

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- 650 ADEQUATE VENTILATION AS A PROFIT BUILDER. Fred Merish. Steel, 3 pp. (July 10, 1939).

During a recent study of ventilation in industrial plants, 70% of the plants visited were found to be using some form of obsolete or inadequate ventilating system. Industrial ventilation is an important part of plant operation that management has many times overlooked. There are numerous evidences of increased production, reduced cost, and better product in addition to better working conditions that have been brought about by comparatively inexpensive installations of certain types of ventilating equipment. Installations should be supervised by expert ventilating engineers as the problems connected with them are sometimes more difficult than appear on the surface.

- 651 EFFECTIVE EXHAUST SYSTEMS. J.M. Kane. Nat. Safety News. 40, 26-7, 70. (August 1939).

In many cases exhaust systems when installed are not completely satisfactory because certain basic concepts are not clearly understood or the importance of some details not fully appreciated. Major items in this category are: (1) the proper use of blast gates in the branch ducts; (2) the factors involved in providing for additional future capacity; (3) necessary specifications for design and installation of systems; and (4) the hazard from recirculation of cleaned air from dust collectors removing injurious dusts.

(C) Papers on Industrial Poisons, Cancer, Dermatitis, etc.

- 652 THE PHYSIOLOGICAL EFFECTS OF SMALL AMOUNTS OF LEAD: AN EVALUATION OF THE LEAD HAZARD OF THE AVERAGE INDIVIDUAL. A.S. Minot. Physiol. Rev. 18, 554-577 (October 1938).

This is an excellent summary of recent investigations in regard to lead poisoning. It covers briefly most of the important problems related to the subject, such as distribution of lead, a survey of normal lead exposures, sources of "normal" lead, and the like. There is then a discussion of the amount of lead causing poisoning, and the methods of absorption. There is also a discussion of the biochemical and chemical action of lead on the body. The article is practically entirely a summary of the existing literature and as such is extremely well written, with the important references and, on the whole, a good evaluation of divergent points of view. As it is written by an investigator who has contributed valuable material to the problem, it is a very convenient way to become readily and authoritatively conversant with the present knowledge.

- 653 PATHOLOGIC CHANGES IN RATS AND IN DOGS FED DIETS CONTAINING LEAD AND ARSENIC COMPOUNDS. COMPOUNDS USED: LEAD ARSENATE, ARSENIC TRIOXIDE, CALCIUM ARSENATE, AND LEAD ACETATE. L.L. Finner and H.O. Calvery. Arch. of Pathol. 27, 433-46 (March 1939).

This paper gives a preliminary and incomplete report of experiments that were carried out on young rats and dogs. Lead and arsenic compounds were added to an otherwise normal diet. The positive gross and microscopic findings were as follows: The rats that received 1.28 gm. of lead acetate over a period of 6 to 7 weeks were undernourished and the hair was dull. There was an average decrease of 17% in hemoglobin accompanied by a decrease in the number of red and white cells. Basophilic stippling was observed in the red cells. The weight of kidney, spleen and heart was increased. The long bones were fragile. Microscopic study revealed a heavy deposit of lead in all the bones. Animals receiving 3.53 mg. of lead arsenate over a period of 10 to 12 weeks were essentially normal on macroscopic and microscopic examination. Rats given 107 mg. of arsenic trioxide over a period of 6 weeks showed hyperplasia of bone marrow. Rats given 107 mg. of calcium arsenate over a period of 6 to 7 weeks showed edema of the

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abdominal subcutaneous tissue and an increase in weight of spleen and kidney, 18 and 31% respectively. Dogs whose intake of lead acetate averaged 1.5 mg. per kg. per day showed signs of an involvement of the central nervous system. The teeth were spotted and the bones showed a deposit of lead. In the dogs receiving less lead acetate, 0.33 mg. per day, there were no central nervous system symptoms. The bones were found to be brittle and there was a decrease in the size of marrow cavity. Kidney changes were present. The authors concluded that small amounts of lead and arsenic added to the diet acted as tissue poisons.

- 654 **BASOPHILIA AFTER DRINKING LEAD-CONTAINING WATER.** A. Winkler and H. Wicsbrock. *Ztschr. f. Hyg. u. Infect.* 121, 433-37 (1939). (German).
The authors examined the blood of school children in two villages. In the first village the water contained up to 2.3 mg./l. whereas in the second, where the water was filtered, only small amounts were found. In the latter village only 9 children's blood showed 300-500 punctate erythrocytes per million, and 309 had values below 300. In the first village 13.9% of the children had 300-500, 6.4% had 500-1000, and 4% had over 1000. The highest value found was 2300.
- 655 **CONTROL OF LEAD IN THE STEEL PLANT.** E.D. Martin. *Metal Progress*, 35, 457-63 (May 1939).
Lead, in concentrations as low as 0.25% in steel, imparts to the metal certain beneficial qualities without the sacrifice of essential properties. The manufacture and use of the lead-steel alloys has led to the necessity of adopting certain rules pertaining to hygienic conditions in the plants. The first part of this paper is devoted to the elementary principle of lead absorption and lead poisoning in the body, following which is a discussion of the air sampling apparatus and technic that are generally used. In one particular plant lead samples at a number of points showed the most hazardous locations where it was necessary to install local exhaust ventilation to bring the average exposure below dangerous levels. Measurements were made out-of-doors also to estimate possible atmospheric pollution by the steel plant. The result of the survey and the application of the methods of dust and fume control showed that it is not unreasonably expensive to control an occupational hazard. A succeeding article is to tell of the problems involved in the plants of users of leaded steel, such as in welding, burning and handling.
- 656 **BENZINE POISONING.** Edited by B. Behrens. *Samm. v. Vergiftsf.* 9, Bull. No. 10, 69-74, 133-150 (1938). (German).
One of the authors, H.H. Jansen, describes observations on neuritis ischiadica and traumatic epilepsy after acute benzine poisoning. In the first case there was injury to the nerves of the legs with almost no tendency to heal. The second case was considered as one of epilepsy directly related to the poisoning. The third was a case of early traumatic epilepsy after acute benzine poisoning as a result of prolonged injury (localized). Another author, F. Quensel, describes a case that was first thought to be one of disseminated cord disease from acute benzine poisoning. Some years later Quensel had the opportunity of examining the patient again. A section showed the presence of centers of multiple sclerosis. On the basis of these findings, the disease and accident history, a connection between the benzine poisoning and the sickness was not accepted. The appearance of multiple foci of softening after acute benzine poisoning thus has not been proved.
- 657 **THE USE OF BENZENE IN RUBBER SOLUTIONS.** Koldehofe. *Arbeitsschutz*, pp. 80-82 (1939). (German).
The author experimented on the use of rubber solutions with benzene and benzine as adhesives. He concluded that seams could best be made with rubber-benzene solutions, but a specially strong seam is achieved by employing a 12% benzene solution. The German artificial rubber "Buna" needs benzene or toluene.

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- 658 CASE OF POISONING BY NITROBENZENE. L. Walterskirchen. Wien. klin. Wchnschr. 52, 317 (1939). (German).
A man was severely poisoned by taking a teaspoon of nitrobenzene, but improved rapidly after he was given an intravenous injection of chromosmon (methylene blue) with 33% dextrose and 0.2 mg. strophanthin.
- 659 ACUTE ARSENIC POISONING. W. A. Porter. Virginia Med. Monthly, 66, 148-151 (March 1939).
Besides the usual treatment of arsenic poisoning Porter used 800 international units of vitamin B₁ daily. The salient feature in the patients receiving the vitamin was the absence of diarrhea. It is his belief that the use of vitamin B₁ has a definite place in the treatment of toxic neuritis from metal poisoning. Prompt improvement of neuritic pains occurred after the vitamin B₁ had been administered for only a few days.
- 660 ACUTE ARSENIC POISONING FROM POTATO BUG INSECTICIDE. H. Symanski. Samm. v. Vergiftsf., 10, 1-8 (February 1939). (German).
A man sprayed an arsenic insecticide for about three hours. That night he vomited and had diarrhea; the next morning he was unable to eat bread as usual for his lunch, but could do other work. The arm became weaker and lacked feeling; he could lift it from the shoulder but could not bend it. When he was examined about two weeks later the arm was colder than the left, weak, and somewhat reduced in circumference. Sensibility was decreased. These symptoms were somewhat less pronounced three months later. The findings are given in detail.
- 661 DAMAGE TO THE MIDBRAIN AND POLYCYTHEMIA AFTER CARBON MONOXIDE INTOXICATION. F. Dittmar. Deutsch. med. Wchnschr. 65, 500-02 (1939). (German).
The paper concerns a fireman who was repeatedly exposed to small concentrations of fumes and carbon monoxide. He showed symptoms of a true polycythemia: enlargement of the spleen, increase of basal metabolism, erythrocytosis (6.91 million), leucocytosis, lymphopenia and thrombocytosis. There were also symptoms of injury to the midbrain: nervous irritability, insomnia, disordered gait. The author points out that the polycythemia cannot be considered as an adequate physiological regulation against the carbon monoxide anemia. Its occurrence with the symptoms of the midbrain refers to an irritation of the nervous centers; additional observations concerning this coincidence are necessary.
- 662 CIRCULATORY REFLEX OF THE CAROTID SINUS IN CARBON MONOXIDE POISONING. H.W. Kayser. Arch. f. exp. Path. 190, 248-55 (1938). (German).
At 50% carbon monoxide saturation, complete occlusion (by clamping) of the carotids in cats results in decreased blood pressure and heart rate. This apparent reversal of the usual response of the circulation (via the carotid sinus) to such stimulation is shown to disappear after atropin, cardiazol, coremin or vagotomy, and is therefore to be ascribed to disturbances in the heart muscle, the vessels or the sensory endings in the carotid sinus. A similar apparent reversal of the reflex function of the carotid sinus is attainable by clamping the carotids in cats which are anemic or have increased intracranial pressure; the same procedures cause this anomalous response to disappear as in carbon monoxide poisoned cats. The suggestion is made that carotid occlusion in cats already suffering from reduced oxygen supply to the medulla results in sufficient anoxemia of this area to excite strongly the vagus center, impulses from which mask the usual carotid sinus reflex. It is striking that simple reduction of oxygen in the inspired air intensifies the normal carotid sinus reflex, never producing the apparent reversal described.

- 663 EXPERIMENTAL RESEARCH ON RESPIRATION DURING CARBON MONOXIDE COMA, ITS MODIFICATION BROUGHT ABOUT BY BILATERAL VAGOTOMY, TREATMENT WITH METHYLENE BLUE AND INHALATION OF CARBON DIOXIDE. L. Di Prisco. *Folia med.* 17, 173-181 (1939). (Italian).

In experiments on rabbits during carbon monoxide coma, there was no Cheyne-Stokes respiration, only a simple dyspnea with increase of frequency and depth of respiration which became slow and arrhythmic in the pre-terminal stage. Bilateral vagotomy slows the respiration, intravenous injection of methylene blue has no effect, but inhalation of carbon dioxide increases the respiration rate and improves the general state.

- 664 NEPHROSIS DUE TO CARBON TETRACHLORIDE. H. Smetana. *Arch. Intern. Med.* 63, 760-777 (April 1939).

This is a review of 5 cases of toxic nephritis, two of them fatal, due to inhalation of carbon tetrachloride vapors, with an excellent discussion and review of the literature, and also some excellent illustrations of renal pathology. The author concludes that in addition to hepatic damage, carbon tetrachloride poisoning sometimes causes alarming renal symptoms such as oliguria or anuria, nitrogen retention and subsequent hypertension; the urine contains albumin, white blood cells, red blood cells, casts and bile. The anatomic basis for the clinical renal symptoms is nephrosis, characterized by, (1) distention of the spaces of Bowman with albuminous precipitate, (2) by swelling of the lining cells, and swelling and vacuolation of the cells of the proximal convoluted tubules, (3) by degeneration and necrosis of the cells of the distal convoluted tubules, and of those of the loops of Henle, with desquamation, and (4) by the presence of granular, hyaline and cellular casts in the tubules, with plugging of their lumens. Concretions are present, the nature and significance of which are obscure. Various clinical and pathological features of carbon tetrachloride poisoning are discussed.

- 665 AMOUNT OF PHENOL IN THE BLOOD IN EXPERIMENTAL POISONING BY CARBON TETRACHLORIDE, CHLOROFORM AND PHOSPHORUS AND IN MECHANICAL INJURY TO THE LIVER. D. Yanagihara. *J. Chosen Med. Assoc.* 29, 37-57 (January 20, 1939). (Japanese).

In experimental poisoning as well as when the bile duct is ligated, free phenol in the blood increases gradually. The amount of conjugated phenol, however, shows no noteworthy change. Excretion of phenol in the urine decreases. With an Eck's fistula and the hepatic artery ligated in a dog, free phenol in the blood increases, the conjugated phenol falls. Thus it would seem that the detoxification of phenol is not a specific function of the liver.

- 666 METHODS FOR THE DETECTION OF TOXIC GASES IN INDUSTRY. VI CARBON BISULPHIDE VAPOR. Great Britain, Dept. Scientific & Industrial Research. 8 pp. (May 1939). (British).

This is the sixth in a series of descriptions of simple methods for detecting various gases encountered in industry. The method for carbon bisulphide does not differ greatly from the other methods previously noted. Samples of the air are drawn by means of a handpump of definite capacity, through a bubbler of alcohol containing the reagents -- diethylamine and copper acetate -- and the mixture allowed to stand. The color, caused by the compound diethyldithiocarbamate is compared to standards previously made from dilute solutions of carbon bisulphide in alcohol. Concentrations down to 1 part in 120,000 can be estimated by the method and the tests can be made by non-technical personnel. Concentrations of the gas in the range of 1:15,000 to 1:30,000 have been shown to be slightly toxic and a preferable limit would be 1:100,000.

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- 667 DETECTION OF CARBON BISULPHIDE. A. Castiglioni. Z. anal. Chem., 115, 257-59 (1939). (German).
The reaction between piperazine and carbon bisulphide can be used to advantage for the detection of the latter; in concentrated solutions in alcohol a pale yellow precipitate of piperazine-carbon bisulphide is formed. The test will serve to detect 0.5 mg. of carbon bisulphide at a dilution of 1:2000.
- 668 RADIUM POISONING FROM WATCH DIAL PAINTING. J. Am. Med. Assoc. (Queries and minor notes) 112, 1855 (May 6, 1939).
A woman has necrosis of the mandible and superior maxillae. Until 12 years ago she worked at radium dial painting but was tested then and found negative. If other causes are eliminated, radium should be suspected, and her body tested for radio-active substances. There is a ¹⁰⁸/_{list} of references.
- 669 BLOOD CHANGES DURING EXPERIMENTAL POISONING BY BARIUM SALTS. G.G. Zolezzi and A. Stazzi. Med. del lav. 30, 44-55 (1939). (Italian).
Experiments on rabbits with barium chloride and barium nitrate. Minimum, toxic and fatal doses are listed. The smallest ones incite blood changes, larger ones at first have a vasomotor effect, and later a hemolytic one, leading eventually to anemia.
- 670 THE INFLUENCE OF DIET ON THE CHRONIC TOXICITY OF SELENIUM. M.I. Smith. U.S. Public Health Reports, 54, 1441-53 (August 4, 1939).
Experiments made on rats show that the toxicity of naturally occurring food selenium is largely determined by dietary factors. A level of intake of selenium, which is highly toxic and tissue-damaging when fed in a diet of low protein-high carbohydrate content, is only slightly harmful, if at all, when fed in a diet of high protein-low carbohydrate content. Available evidence indicates that the toxicity of selenium, within certain limits as to levels of intake, is determined more by the protein-selenium ratio than by the selenium level. No mention is made of any possible connection between the protein content of the diet and the absorption of selenium by means other than in the food.
- 671 TOXICOLOGY OF DINITROTOLUENE AND PATHOLOGY IN EXPOSED WORKERS. Courtois-Suffit Arch. Malad. profess. 1, 294-7 (1939).
The principal toxic effect of dinitrotoluene results from the inhalation of its vapors. The rate of absorption in workers who are chronic alcoholics is greatly increased. The principal effect is on the nervous system and the blood. The author reviews his experience with this chemical in powder mills.
- 672 SKIN INJURY FROM DICHLORODIETHYLSULFIDE REMAINING UNDER A FINGER RING. E. Gillert. Med. Klin., 35, 428 (1939). (German).
A druggist working with a substance containing dichlorodiethylsulfide neglected to remove his ring when washing. A severe inflammation broke out a few hours later, beginning at the ring, and he was incapacitated for 4 weeks.
- 673 TOXICOLOGY AND HYGIENE OF CHROMIUM. J.A. Labat. Bull. trav. soc. pharm. Bordeaux, 76, 191-201 (1938). (French).
The toxicology of chromium compounds is reviewed. The destruction of organic matter with nitric-sulphuric acids, oxidation of trivalent chromium to dichromate with sulphuric acid, silver nitrate and potassium thio sulphate, and test with diphenylcarbazide to produce a red color are described.

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- 674 APPARATUS FOR MICROANALYSIS OF GAS. C.H. Prescott, Jr. and J. Morrison. Ind. and Eng. Chem. 11, 230-33 (1939).
This article describes modern refinements of apparatus and technic for the rapid analysis of minute amounts of gas. On samples of 5 to 25 cu. mm. at normal temperature and pressure, analyses may be made with errors for each component within 2% of the total sample. The errors are within 5% on quantities of gas as small as the proverbial limit of 1 cu. mm. The methods described are available for water vapor, carbon dioxide, hydrogen, carbon monoxide, oxygen or methane. One hour is required for a complete general analysis. Under special conditions the least detectable quantity of a component may be pushed to a limit of 0.025 cu. mm., equivalent to the carbon monoxide in 1 sq. cm. of a mono-molecular film.
- 675 A NEW INFLAMMABLE VAPOR DETECTOR. R.B. Brock. Chem. and Ind., 58, 286-287 (April 1, 1939).
This detector is not new in principle. It is, however, a new portable model of the Redwood Hydrogen Flame Apparatus. The size has been reduced to overall dimensions of 15-1/2" long by 15" high by 5-1/2" and to a weight with accessories of 16 pounds. The ease of manipulation of the fittings and of all other operations has been greatly increased. The Redwood Detector which is described in detail in Sir Bovington Redwood's book "Petroleum and its Products," has been used in Great Britain for over 30 years, mainly for the determination of petroleum vapors, and still seems to have extensive use in that country. In the United States, the Redwood Detector is practically unknown; in this country, electrical detectors of the hot filament type have been developed during the last 10 years to such a stage of perfection, that they surpass any other type in accuracy, compactness, ease of operation and safety. Therefore, it is doubtful that even the present improved model of the Redwood Detector will find many users here.
- 676 CONTRIBUTION TO THE PATHOLOGICAL STUDY OF SALT MINE WORKERS. L. Reale. Rass. Med. Industr., 10, 17-27 (January 1939). (Italian).
A clinical study was made among 800 workers in a salt mine in Cagliari. A comparison of the various common illnesses among the workers and a control group is reported and a description of a well defined dermatitis localized strictly in the lower limbs is given. The effect on the upper respiratory tract and the digestive system cited by some authors was not observed. It is maintained that the dermatitis comes from the necrotic, caustic and mechanical action of the salt coming in contact with the skin but since there are not many preventive measures which can be taken, the author suggests cleanliness, and elimination of excessive contact of moist skin with the salt.
- 677 HEALTH INJURY IN MANUFACTURE OF BATH SALTS. P. Rossing. Aerztlich. Sachverstand.-Ztg., 45, 57-58 (1939). (German).
Two workers engaged in making a bath powder fell ill with bronchitis, gastritis and diarrhea. The symptoms are traced to the sodium bicarbonate, sodium borate and sodium hyposulfate which the workers shovelled in a poorly ventilated room.
- 678 INDUSTRIAL HYGIENE IN THE PREVENTION OF DERMATITIS. G.C. Harrold. Occupational Hazards and Safety, 1, 24-7 (August 1939).
Previous articles of this series have discussed mechanical cleanliness within the plants, as well as personal protective devices in common use. This covers the general subject of personal hygiene and sanitation rather than environmental sanitation. Given the proper equipment with which to work and the proper cleansing agents, towels, etc., it is up to the worker to make proper use of them in the prevention of industrial dermatitis. A careless, sloppy approach to any operation will intensify occupational hazards involved. Suggestions are given as

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to the providing of proper facilities for the employees. Washrooms should be adequate and properly equipped. The selection of the soap should receive careful attention, and a good description of this subject is given. The value of good personal hygiene in the prevention of industrial dermatitis cannot be over-emphasized.

- 679 DERMATITIS CAUSED BY A NEW INSECTICIDE. L. Schwartz and L.H. Warren. U.S. Public Health Reports, 54, 1426-35 (August 4, 1939).
Experiments on animals with most of the insecticides show that they are toxic and irritating to the skin, and in sufficient concentration are capable of producing death. The petroleum distillate which is usually used as a solvent for the insecticide is also toxic and, if not specially treated, is irritating to the skin. The new insecticide reported here is a product known as alpha naphthyl isothiocyanate, usually mixed with pyrethrum to obtain the toxic effect. Workers in the plant manufacturing the product became seriously affected with dermatitis until the processes were enclosed and extreme precautions taken to prevent skin contact. It is recommended that dermatitis producing insecticides such as this one should be properly labeled when sold to the public.
- 680 CARCINOGENIC AGENTS PRESENT IN THE ATMOSPHERE AND INCIDENCE OF PRIMARY TUMORS IN MICE. J.A. Campbell. Brit. J. Exp. Path. 20, 122-132 (April 1939). (British).
The author has continued his research on substances that might induce lung tumors. He employed chimney soot and soot scraped from exhaust pipes of engines burning heavy oils. Rats were exposed to these dusts for 10 minutes an hour for 6 hours, 5 days a week for 1 year. The death rate of both groups was well within the limits of that for the controls but the number of lung tumors was somewhat higher. Of those exposed to exhaust pipe soot, 33% living 10 months or more developed tumors. The most active substance tested so far is dust from tarred roads. Data are also given on mice whose skin was painted with "tar" from these substances.
- 681 MORTALITY FROM CANCER OF THE SKIN IN RELATION TO MORTALITY FROM CANCER OF OTHER SITES: AN ANALYSIS OF OCCUPATIONAL MORTALITY STATISTICS OF ENGLAND AND WALES. K.K. Conrad and A.B. Hill. Am. J. Cancer, 36, 83-97 (May 1939).
The authors present many tables showing the relation between mortality from cancer of the skin and from cancer of other sites. They break down the occupational distribution within each of five social classes and fail to confirm the reported inverse association between the above forms of cancer. In fact the data suggest that occupations showing a high mortality from cancer of the skin and lip tend also to show high rates for cancer of other sites.
- 682 OCCUPATION IN REGARD TO CANCER OF THE EYE AND ADnexa WITH PRACTICAL POINTS FOR THE OPHTHALMOLOGIST. L.A. Lane. Am. J. Ophth., 22, 267-273 (March 1939).
In an earlier paper (title will be given on request) the author presented a study of cancer of the eye in different occupations. In the present one, data on 500 cases are given regarding distribution in different groups, types of lesion, anatomic location, etc. Workers exposed to sunlight (plus tar or chemicals in some cases) had a rate of 20.4%; a large group necessarily lumped together as miscellaneous accounted for 72%. The author urges that more careful occupational histories be taken in cancer of the eye cases--not only description of the exact job but length of time held and previous jobs. Follow-up work in eye clinics is said to be less extensive than in most cancer clinics.
- 683 POSSIBLE NEPHROSIS FROM PAINTS. J.Am.Med.Assoc. (Queries and minor notes), 112, 1854 (May 6, 1939).
A girl with nephrosis has been for several years a painter in a furniture factory where she uses lacquers, turpentine and oil paints but has done no spray painting. Nephrosis alone is seldom seen as the result of exposure to benzene; it is usually accompanied by anemia, leucopenia, etc. It is possible that turpentine may cause the trouble but this cannot be stated definitely.

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- 684 DERMATITIS FROM RED LEAD. J. Am. Med. Assoc. (Queries and minor notes), 112, 1749 (April 29, 1939).

A man employed painting metal with red lead for 6 months developed a general erythematous and intensely pruritic dermatitis that covered almost the entire body. He stopped work immediately, but in spite of constant care and hospitalization, it was 1 year before the condition cleared up. By patch test he was found to be definitely sensitive to the paint he had been using. The reply points out that red and white lead are not widely employed in paints now; some of the pigments substituted are listed as well as the solvents. Dermatitis due to systemic lead poisoning has never been reported.

- 685 I. THE DETERMINATION OF RESPIRATORY QUOTIENT IN REST AND WORK. II. THE COMBUSTION PROCESSES IN LONG-CONTINUED HEAVY WORK. III. WORK CAPACITY AND NUTRITION. IV. HYPOGLYCEMIA, WORK CAPACITY AND FATIGUE. V. RESPIRATORY QUOTIENT AND OXYGEN CONSUMPTION. E.H. Christensen and O. Hansen. Skand. Arch. Physiol., 81, 137-189 (1939). (Skandinavian).

The helmet method of Krogh and Lindhard gives more reliable respiratory quotient values with untrained subjects than the Douglas method, but over long periods the latter method is simpler and sufficiently accurate. Simultaneous determinations of blood carbon dioxide and lactate show that the respiratory quotient attained 10 to 15 minutes after beginning work measures metabolic processes reliably. Three well-trained subjects worked for 160 to 180 min. at a rate of 1120 kcal/min . An increasing proportion of fat was used as time went on but even at the end when blood sugar was 52 mg %, 40% of the energy was being derived from carbohydrate. The proportion of carbohydrate used depends on the available supply and on the work intensity. These subjects when on a high carbohydrate diet could carry on this work 2 to 3 times as long as when on a high fat diet. Correspondingly, sugar ingestion during work increased the capacity for work. Relief came before the rise in respiratory quotient. It is suggested that under such conditions fatigue may depend on cerebral symptoms associated with hypoglycemia. In submaximal activity constant values for blood lactate and carbon dioxide may be attained, and the respiratory quotient then measures metabolic processes. When blood lactate is increased the respiratory quotient, when a steady state is attained, exceeds the resting level. If constant values are not attained, as in maximal work, the extra respiratory quotient of work and recovery depends on increased lactic acid combustion. Ketone bodies, which are readily utilizable by muscle, may be supplied by the liver when the carbohydrate supply is low. The reduced capacity for work under such circumstances may depend on the limited capacity of the liver for mobilizing ketones.

- 686 I. PULSE FREQUENCY AND BODY POSITION. II. THE EFFECTIVENESS OF BLOOD PRESSURE REGULATION IN VARIOUS BODY POSITION. III. CIRCULATORY INSUFFICIENCY IN THE STANDING POSITION WITH NORMAL ARTERIAL PRESSURE AND REDUCED MINUTE VOLUME. IV. THE DEPENDENCE OF THE PULSE FREQUENCY DURING WORK ON BODY POSITION. E. Asmussen, E.H. Christensen and M. Nielsen. Skand. Arch. Physiol., 81, 190-233 (1939). (Skandinavian).

When the body is supported passively at an angle of 60° with the head up, systolic blood pressure is unchanged, pulse rate increases at once and minute volume decreases. With the head down at the same angle, the pulse rate is less than in the horizontal position and minute volume is the same as in the horizontal position. All these changes are associated with distension in the one case, and collapse in the other, of veins in the legs. The response of the pulse to changes in position is an important element in the compensation for changes in venous pressure arising from pooling of blood in the veins below the heart. A suddenly produced hyperemia in the legs produces in the erect posture a great decrease in systolic blood pressure. This depends on the combined effect of posture and of

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hyperemia in the extremities. The effect is small in the horizontal position and may be absent in the head-downwards position, where the effect of anoxemia is opposed by the hydrostatic factor. Symptoms of circulatory insufficiency were seen in the erect posture: absorption of water from the gut and renal excretion were reduced. The diminished minute volume must be looked upon not as a regulatory adaptation but as a disadvantage. Arterial blood pressure is maintained by restriction of blood supply to the kidneys and gastrointestinal tract. Experiments with arm work in various body positions proved that, just as in rest, the pulse rate depends to a considerable extent on the hydrostatic displacement of blood: the blood depots cannot fully compensate for the pooling that occurs when the body is passively supported at an angle of 60°.

- 687 RELATIVE ROLES OF EXTREMITIES IN BODY HEAT DISSIPATION--NORMAL CIRCULATION AND PERIPHERAL VASCULAR DISEASE. C. Sheard, G.M. Roth and B.T. Horton. Arch. Phys. Therap., 20, 133-142 (March 1939).
Continuing the work started about two years ago, the authors present additional observations showing the importance of the extremities in the control of body heat loss when the external temperature, or the internal heat produced, is changed. Alterations of atmospheric humidity had little or no effect upon skin temperature of the extremities. The reactions of persons affected with peripheral vascular diseases differed from those of normal persons and the differences are held to be of considerable importance in medical diagnosis and treatment.
- 688 ELECTROCARDIOGRAPHIC CHANGES DURING WORK PERFORMED WHILE WEARING A MASK. I. OBSERVATIONS ON HEALTHY MEN. H. Zettel and A. Fink. Klin. Wchnschr. 18, 452-51 (1939).
Examination of the literature on electrocardiographic changes during work with masks show that there is little agreement on the subject. The present authors examined 20 young persons wearing masks, who ran for 1 minute with and without a 25 lb. weight. Changes were observed in both cases, but were especially great when the extra weight was borne. Changes were acceleration of pulse, increase of systolic blood pressure, usually a shortened conductance time, etc. The authors believe that the changes are due to lack of oxygen, not to defective respiration from stenosis (stricture of air passages).
- 689 POSSIBLE HEAT STROKE WITH APHASIA. J. Am. Med. Assoc. (Queries and minor notes), 112, 1989 (May 13, 1939).
A man digging a cellar in the hot sun suddenly lost consciousness, a condition which persisted for 4 days. At the hospital he had a subnormal temperature and excessive sweating. On regaining consciousness, he was found to have motor aphasia, apraxia, paraphasia and partial auditory aphasia but not alexia. Right hemiparesis and hemispraxia were present. No renal, cardiac or other organic symptoms were present. The symptoms have not changed in 6 months since the accident. In the reply it is stated that heat stroke probably is not responsible unless the man was perfectly free of organic disease before the coma. With heat stroke, the temperature would be 104-108° with coma and increased spinal fluid cell count. Ordinarily in heat stroke there is widespread ganglion cell damage giving rise to hemiplegia, paraplegia, ataxia and aphasia as well as convulsions and psychosis. The case described presents the typical picture of heat exhaustion, not heat stroke.
- 690 EXTREME HYPERPYREXIA AND PROLONGED CONVULSION ACCOMPANYING HEAT STROKE. C.C. Fitzgibbon. Calif. & West. Med., 50, 360 (May, 1939).
A man working all day with the temperature at 105° in the shade had heat stroke with continual convulsions. The axillary temperature was above 110°--as high as the thermometer would go, and he seemed on the point of death. The convulsions lasted 1-1/2 hours until they were relieved by treatment with ice packs, saline

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injection, 3-3/4 gr. sodium amytal, followed by coramin, caffeine and metrazol. In 1 hour he was better and complete recovery took place after a week in the hospital. Blood and neurological findings are given.

- 691 REACTIONS OF OFFICE WORKERS TO AIR CONDITIONING IN SOUTH TEXAS. A.J. Rummel, F.E. Giesocke, W.H. Badgett and A.T. Moses. Heating, Piping and Air Cond., 12, 323-329 (May, 1939).

Despite the intensity and duration of summer heat in San Antonio, Texas, the most comfortable effective temperature for office workers (71.5°) was found to differ but little from that in cooler regions in which similar studies have been made during the past 10 years. As a rule, women preferred a temperature 2° higher than men. Little trouble is said to have been experienced from "entrance shock," regardless of outside temperature, so long as the indoor effective temperature was not below 71.5°. "Warm shock" on leaving the cooled office was more important, affecting practically the entire group, and in some persons lasting several hours. General reaction to summer cooling was favorable in 67% of the subjects, unfavorable in 10% and indifferent in 23%.

- 692 STIMULATION OF RESPIRATION BY OXYGEN LACK. T. Benziner, E. Opitz and W. Schoedel. Arch. ges. Physiol. (Pflügers) 241, 71-77 (November 9, 1938). (German).

Experiments were carried out on dogs narcotized with morphine and pernocton, the sodium salt of butyl bromallyl barbituric acid. By means of morphine-pernocton narcosis, the sensitivity for carbon dioxide of the respiratory center of dogs can be greatly reduced. The stimulation of respiration by oxygen lack remains constant. In such an animal the respiration is regulated by the periodic oxygen lack resulting from the presence of nitrogen in the alveolar spaces. The length of the pauses in the periodic breathing increases with increasing oxygen content of the inhaled air. The authors state that similar results are obtained if, instead of decreasing the sensitivity for carbon dioxide, the tension of carbon dioxide is lowered (hypocapnia through hyperventilation).

- 693 ACCLIMATIZATION OF THE HUMAN ORGANISM TO LOW ATMOSPHERIC PRESSURES. F. Goebel and S. Marczewski. Acta Biol. Exptl. 12, 87-9 (1938). (Polish).

Dogs were put in low-pressure chambers at a pressure of 210 mm. mercury (altitude of 10,000 meters) for 10 hrs. per day over periods of two months. Blood pH fell from 7.35 to 7.05, alkali reserve was reduced from 40.4 to 32.8 ml. of carbon dioxide per cent, oxygen capacity and the number of red blood cells increased considerably. Intravenous injections of 50-100 mg. or oral administration of 0.5 g. per kg. body weight of ammonium chloride in normal dogs produced increased red-cell count and oxygen capacity. The adaptation of these dogs to conditions of low barometric pressure took place much more quickly.

- 694 SYPHILIS, MALARIA AND HOOKWORM DISEASE AS INDUSTRIAL HAZARD IN THE SOUTH. C.F. Holton. South. Med. J., 31, 1011-1016 (1938).

The author has routinely taken Wassermann tests of all workers sent to him for treatment of industrial accidents. He believes that syphilis, malaria and hookworm dull the mind and tend to make the patients accident prone. In one plant, of 300 Negroes tested, 100 gave positive reactions. A clinic was set up in the shop, treatments given, and any worker refusing treatment was discharged. In the past 8 years the number of accidents has dropped markedly and the plant now pays the lowest insurance rate possible for the industry. Malaria is increasing in the South. It is so enervating that workers suffering from it are not efficient and frequently need to take time off. Hookworm also decreases the workers' general health. The author believes both of these diseases are much more prevalent than is generally realized.

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References to Recent Literature - 18

- 695 SYPHILIS CONTROL IN A CHEMICAL INDUSTRY. G.H. Gehrman. Am. J. Syph., Gon., Ven. Dis., 22, 623-30 (1938).
The author, as medical director of the duPont Company, supervises the health of 40,000 workers, and he writes of the problems involved in syphilis control. Syphilitics must not be allowed to work where conditions may aggravate the disease, and must not work with materials (such as cellophane) that might spread infection among the general public. The syphilitic in a modern, sanitary plant is not considered likely to infect his fellow workers, and he does not seem more prone to such complications as infections or poor union of fractures. Corneal ulcers, however, do seem more common among infected persons. Since 1934 the company has had its own serological laboratory where an average of 100 Kahn tests have been made every day. All new employees are tested and many others retested annually. Old employees who become infected cannot remain unless they take adequate treatment. The company now gives free treatments to all who cannot get proper treatment elsewhere. This practice was begun when it was found that sending workers to their own doctors or to clinics did not have satisfactory results.
- 696 INCIDENCE OF AIR-BORNE BACTERIA IN THE MAJOR SURGERY OF THE MULTNOMAH COUNTY HOSPITAL. O.M. Nisbet and J.W. Brooke. Surgery 4, 755-61 (1938).
Blood agar plates were exposed in the surgery for 30 minutes, then incubated. The authors find that the number of air-borne bacteria in the major surgery of the Multnomah County Hospital is roughly proportional to the number of people present in the surgery and to the activity on the floor proper of the surgery. The greatest proportional rise in incidence is manifested by the streptococci and by staphylococcus albus.
- 697 OCCUPATIONAL DISEASES OF DISINFECTORS. H. Wiese. Veroffentlich. Geb. Volksgesundheit. 52, No. 8 (1939). (German).
The author collected information from the literature, from industrial organizations, and from health unit personnel. Persons performing disinfection of precincts evidently seldom suffer infectious diseases themselves--not one serious case was discovered in the last 10 years. Perhaps a specific immunity is acquired by subclinical infections. Among the chemicals employed, mercury causes skin diseases as do cresol compounds; chloramin causes irritation of the mucous membranes, formaline causes chronic eczemas. None of these disorders were severe enough, however, to cause any man to change his occupation. Men employed in destroying infected animals, however, were more exposed to danger.
- 698 A CASE OF WEIL'S DISEASE CAUSED BY LEPTOSPIRA SEJROE, ACCOMPANIED BY MENINGITIS AND PARALYSIS OF THE LOWER EXTREMITIES. V. Mortensen. Compt. rend. Soc. biol., 130, 1510-12 (1939). (German).
The author's patient was a farmer who suffered high temperature, headaches, vomiting, and pains in the back and extremities, along with marked jaundice. Meningeal symptoms persisted after the others had disappeared. On the 20th day, paralysis of the legs developed but this was somewhat improved the following day and 2 months from the onset, the patient was almost well. The serological tests gave strongest reactions with Leptospirae Sejroe.
- 699 ANTHRAX IN MINK (MUSTELA VISION). A.W. Greener. J. Hyg., 39, 149-153 (March 31, 1939). (British).
A short description of anthrax outbreaks on mink farms in England. The danger to humans working on infected mink skins is pointed out.

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References to Recent Literature - 19

- 700 TOBACCO POLYNEURITIS. F.V. Kepp. Dtsch. Ztschr. f. Nervenhlk. 146, 182 (1938). (German).
A man, aged 25, worked for 2 years filling cans with tobacco extract and soldered them. In this occupation he was exposed to the tobacco vapors and soiled his hands and work clothes with the fluid. There were no major complaints during the first year of this work. During the second year nausea and vomiting, severe headache and profuse diarrhea occurred, disappearing immediately when he stayed at home for a couple of days. During the last weeks before his admission to the hospital he experienced numbness in arms and legs, weakness and unsteadiness, and finally, attacks of flexor spasms in arms and legs. The examination showed sluggish pupillary reflexes, atactic gait, ataxia in finger-to-nose test and heel-to-knee test, and decreased power in both legs. Pain, temperature and touch sensations were found to be decreased in hands and feet, also in the region of the left ulnar and both peroneal nerves; tendon reflexes were weak and Romberg positive. Electrical stimulation of the muscles gave normal results. No scotomas were found but an eosinophilia of 13%. All signs disappeared in a month under bed rest and Vitamin B treatment.
- 701 INDUSTRIAL EYE ACCIDENTS. T.R. Yanes. Rev. Cubana de Oto-Neuro-Of., 7, 57-78 (1938). (Cuban).
This is a comprehensive treatise on the management of industrial eye injuries, with tables to calculate the percentage loss of vision, visual field and ocular motility, and a formula to determine the total percentage disability. A fee schedule for various ophthalmologic services is also given. The author concludes by outlining a number of tests to unmask malingering.
- 702 WORK OF THE COMMITTEE FOR COMBATING NOISE IN INDUSTRY. Arbeitsschutz, pp. 86-127 (1939). (German).
This is a series of papers on various phases of control of noise in industry. Discussion of noise in several types of plants is offered, much of it very interesting. In one paper a description of the anatomy and physiology of hearing is described, with the effect of noise upon this sense.
- 703 DOWN DRAFT REMOVES FUMES. Anonymous. Nat. Safety News. 40, 84 (September 1939).
Description is given of unique facilities for removing fumes during spray painting. The painting is done over a 7 x 12 foot grating in the floor through which the air is exhausted at 200 ft. per min., sufficient to eliminate the necessity of a booth or partition of any kind around the operation. The fume-laden air is washed with a chemically-treated water spray in a tank directly below the grating. Exhausting downward makes it unnecessary for the operator to ever get in a position where he can inhale the fumes.

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UNITED STATES AIR FORCE

November 1955

Sept 1939