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STANDARD

LABOR

AND

Air Hygiene Foundation of America, Inc.
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REFERENCES TO RECENT LITERATURE ON INDUSTRIAL DISEASES

Correction:

In our notice sent last month regarding Bibliofilm Service, under section (2) the cost of photoprints should read 20 cents for the article, plus 10 cents per page, instead of 5 cents per page, as stated. All statements as to comparative cost still hold true.

(A) News Items

- 398 COMPENSATION FOR SILICOSIS. Labor Standards 1, 4-5 (April 1938).
Upon recommendation of Industrial Commissioner Elmer F. Andrews, the New York Legislature is now considering a bill to put compensation for total disability or death due to silicosis or other dust diseases on the same basis as that for accidental injuries and death. The amendment provides for stepping up the compensation gradually over a period of 5 years. This recommendation is based upon experience under the present act which indicates clearly that compensation for silicosis is materially less costly than was predicted by the opponents of the act. During the first 18 months of operation under the silicosis amendment there was a total of 18 awards with an approximate cost of \$12,000. The pending amendment carries a further recommendation of the commissioner liberalizing the period of time allowed for medical treatment. Here again experience has shown that the limitation of medical treatment of 3 months in the present statute lost sight of the cases that were complicated by tuberculosis.
- 399 SILICOSIS BILL. Labor Standards 1, 6 (May 1938).
A bill to regulate interstate commerce in goods produced under conditions exposing employees to the hazards of silicosis and related dust diseases has been introduced by Congressman O'Connell of Montana.
- 400 COOPERATING TO ENFORCE WORKMEN'S COMPENSATION. Labor Standards 1, 5 (April 1938).
Pointing out that 185 claims had been filed with the Ohio Industrial Commission during the last half of 1937 by employees whose employers had failed to comply with the workmen's compensation law, Thomas J. Donnelly, secretary-treasurer of the Ohio State Federation of Labor, urged workers on a job where three or more were employed to demand proof of their employer that he was paying into the State insurance fund, if notice of compliance was not posted. Injured workmen are protected in such cases, as the employer is liable; but considerable delay is sometimes experienced, since the claim must be turned over to the attorney general for collection and since it is often necessary to enter suit and secure judgment.
- 401 NORTH CAROLINA'S X-RAY TRAILER. Labor Standards 1, 6 (April 1938).
The North Carolina Department of Health and The Industrial Commission have jointly operated a cruising X-ray laboratory since last summer to evaluate occupational diseases in the state and to make preemployment examination of persons entering industries that mine or process siliceous minerals. (A similar cruising laboratory in use in New York has been mentioned in abstract 188.)

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- 402 PROPOSED SAFETY STANDARDS IN WASHINGTON STATE. Labor Standards 1, 5 (April 1938).
The State of Washington's Department of Labor and Industries has recently issued proposed new standards: (a) On the control of dusts, gases, and fumes in their relation to occupationally acquired diseases; (b) on the operation and construction of self-propelled vehicles used within docks, warehouses, and other enclosed premises; and (c) on the illumination requirements of different classes of hazardous industries.
- 403 ADVISORY COMMITTEE ON SAFETY AND HEALTH. Labor Standards 1, 4 (April 1938).
The Secretary of Labor's advisory committee on safety and health met on February 8th to consider activities of the Division of Labor Standards. Mr. Zimmer outlined the Division's assistance in State training courses for factory inspectors and it was agreed that the plan was one of the best methods of educating small plants in the practice of safety. The committee urged continued promotion of this work. The certification of factory inspectors was unanimously approved. Among items discussed were State industrial hygiene units, the problem of divided authority between State health and labor departments, and the scope of this activity. The general conclusion was that their work should be confined to "diseases arising out of and in the course of employment."
- 404 "STOP SILICOSIS." Labor Standards 1, 7 (May 1938).
The silicosis film mentioned in our abstract No.186 had its premiere showing at Washington, April 8th and was enthusiastically received. It was shown at Mellon Institute, May 26th, under the auspices of Air Hygiene Foundation. The film takes about 15 minutes to run and is available in 16 and 25-mm. sizes (sound on film). It may be borrowed at the cost of transportation charges by application to the Division of Labor Standards, U.S. Dept. of Labor, Washington, D. C.
- 405 INDUSTRIAL HYGIENE, UNIVERSITY OF MICHIGAN. Emory W. Sink. Ind. Med. 7, 196-9 (April 1938).
A course in industrial hygiene, given one semester of each year at the University of Michigan, is described in full outline form. It is a graduate course, but open to undergraduates who have had training in hygiene. The relation of hygiene to industry is emphasized, but the broader aspects of health promotion are treated.
- 406 INDUSTRIAL HYGIENE COURSE, UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE, DEPARTMENT OF INDUSTRIAL HYGIENE. T. Lyle Hazlett. Ind. Med. 7, 194-5, (April 1938).
A chair in Industrial Hygiene was established at The University of Pittsburgh in 1936. The course of lectures to the senior medical students is given by men who are actively engaged in the problems of dusts, fumes and gases, and other industrial hazards. Two fellowships have been established. An outline list of the lectures given in 1937-38 is included.
- 407 EDUCATIONAL ACTIVITIES OF THE OCCUPATIONAL DISEASE DEPARTMENT, NORTHWESTERN UNIVERSITY MEDICAL SCHOOL. Ind. Med. 7, 276 (May 1938).
The course in occupational disease is briefly outlined. Undergraduate teaching includes formal lectures on industrial medicine, an occupational disease clinic and other outpatient dispensaries holding clinics on specific aspects of occupational disease. Graduate work includes various regular meetings, conference with medical representatives of contributing companies, clinics and plant surveys.

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- 408 FURTHER TRAINING FOR PENNSYLVANIA FACTORY INSPECTORS. Labor Standards 1, 4 (April 1938).
Plans for an additional training course for factory inspectors have been presented at a joint meeting of State and Federal authorities. The course was planned for 15 consecutive week ends of 1-1/2 days' work each, beginning about the middle of March. Five meetings were to be devoted to each of 3 subjects: basic machine guarding, occupational disease codes and safety promotion. The group also considered the preparation of bulletins for all inspectors, explaining the governmental set-up within the State, the Department of Labor and Industry, its functions, laws and codes, and specific codes. The appointment of "roving teachers" to carry on in-service training for inspectors and a school for supervisors were also discussed.
- 409 THIRD SYMPOSIUM ON SILICOSIS. B.F. Kuechle, editor. 266 pages (1937). Obtainable from Employers Mutual Liability Insurance Co., Wausau, Wis., or Saranac Laboratory, Saranac Lake, N. Y. Price \$3.00.
This is the official transcript of the Third Silicosis Symposium, held at Saranac Lake, June 21-25, 1937. The papers presented deal with a wide range of subjects in the field of silicosis, and the authors include a number of the foremost American authorities on the subject. Brief abstracts of these papers will be given in our bulletin in the near future, but the published report will be a valuable addition to any library on silicosis and allied diseases.
- 410 EIGHTH INTERNATIONAL CONGRESS. Ind. Med. 7, 239 (May 1938).
The Eighth International Congress of Industrial Accidents and Occupational Diseases will be held at Frankfurt-on-Main, September 26-30, 1938. The President of the Congress is Prof. Martinek, of the Prussian Ministry of Labor. The Secretary-General is M. Bauer, adviser of the same Ministry. The Congress will consist of 3 sections: (1) Industrial Accidents; (2) Occupational Diseases, and (3) Combined sections. It is expected that a group of members of the Permanent Committee for America will attend. Dr. R.R. Sayers of the U.S. Public Health Service is President of this group, and several papers are expected.
- 411 LAWS LIMITING HOURS OF EMPLOYMENT FOR MEN, AS OF JANUARY 1, 1938. U.S. Monthly Labor Rev. 46, 462-8 (Feb. 1938).
In 1937 Pennsylvania and North Carolina enacted comprehensive laws regulating the hours of men in private employment. The Pennsylvania law places the limitations at 44 hours per week, 8 hours a day and 5-1/2 days per week. It does not apply to agricultural labor, domestic servants, or persons in higher-paid executive or professional work. The North Carolina law limits the hours of labor of men to 10 per day and 55 per week. There are a number of exceptions, and the law does not apply to an employer of 8 or fewer employees. Prior to the passage of these laws, there has been little legislation except in the case of certain unhealthy or hazardous trades, but such laws as have been enacted on hours of labor for men are reviewed in this paper.
- 412 NEWLY DESIGNED RESPIRATOR. Ceram. Ind. 30, 63 (May 1938) and other sources.
Information available from Willson Products, Inc., Reading, Pa.

The new No. 200 respirator, made by Willson Products, Inc., has been approved by the U.S. Bureau of Mines for protection against "A" dusts. The "Rotiform" filter is so designed that an effective filtering surface of more than 30 sq.in. is confined in a relatively small area. This provides adequate filtering efficiency combined with low breathing resistance, it is said, and the construction is such that it will last indefinitely before replacement is necessary. When clogged with collected dust to the point that the breathing resistance is increased, the respirator is easily cleaned by introducing a jet of compressed air into the core.

- 413 GAS MASKS STORED IN NITROGEN. J. Am. Med. Assoc. 110, 750-751 (Mar. 5, 1938). The British government now has 26 million civilian gas masks and is still producing about 100,000 a day. The masks are stored in special depots, the face pieces in nitrogen at 2 atmospheres pressure to prevent deterioration.

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

- 414 SOME PITFALLS IN THE DIAGNOSIS OF SILICOSIS. H.I. Spector. Diseases of the Chest (February 1938). Ind. Med. 7, 225-7 (April 1938). Reprints obtainable from Dr. Spector, Dept. of Internal Medicine, St. Louis University, St. Louis, Mo. It is generally agreed that a diagnosis of silicosis should be based upon: (1) history; (2) fluoroscopic and roentgenographic examination; (3) physical examination, and in autopsy; (4) macroscopic and microscopic examination of the lungs, and (5) chemical examination of dried lung tissue. The author outlines the essentials of each of the methods, and points out the pitfalls that may be encountered in each. In conclusion, he says that "there is no pathognomic symptom, sign or X-ray shadow in silicosis that cannot be simulated by other diseases. Therefore, all factors must be considered in making a diagnosis of silicosis." He also quotes from the report of the committee of the American Public Health Association that "only the physician who has examined the subject, has obtained an occupational history of any adequate exposure to silica dust, and has before him a suitable roentgenogram of the chest, should make the diagnosis of silicosis. The roentgenologist not in possession of these facts can merely state whether the shadows which he sees in a film are consistent with his diagnosis."

Among the pitfalls to be avoided are diagnosis on inadequate history, neglect to observe other possible causes of a chest condition, and failure to allow for possible exaggeration of symptoms. Hemoptysis is generally believed to be an indication of associated tuberculosis, but that belief is not always confirmed by autopsy. The value of physical examination as a diagnostic aid is a matter of controversy. The author regards bilateral diminution of chest expansion, dullness on percussion and a softening of breath sounds as good indications of silicosis. The roentgenogram gives reliable evidence in the later stages, except in cases of pleural thickening, but in the earlier stages the findings may be confused. The author believes that the various laboratory tests for silicosis such as sputum, blood and urine examinations are not of diagnostic value and that post-mortem specific diagnostic laboratory tests are of academic and medico-legal interest only. However, macroscopic and microscopic examination of the lungs will reveal the presence or absence of silicosis. Silicosis can be diagnosed, even in the early stage, provided all facts are taken into consideration.

- 415 LUNG FINDINGS IN FOUNDRY WORKERS-A FOUR YEAR SURVEY. O.A. Sander. Am. J. Pub. Health 28, 601-9 (May 1938). Reprints probably obtainable from Dr. Sander, 710 N. Plankinton Ave., Milwaukee, Wis.

The results of a study of some 4,000 foundry employees are presented, involving not only lung changes but general physical changes as well. With half the total group having had less than 10 years of foundry exposure, about 7% with silicosis, 60 had tuberculosis which either was definitely active or in which activity was indeterminate. In 8 of these there was definite activity of the tuberculosis. Serial observations have suggested that silico-tuberculosis as seen in foundry workers is primarily a reactivation of a previously acquired but walled-off tuberculosis. Simple silicosis occurring in foundry workers is only very slowly progressive, so much so that no changes have appeared in 4 years of observation. Moreover, the simple silicosis among these workers is only rarely sufficiently advanced to cause symptoms and incapacity for work. These studies, then, suggest that the tuberculosis rate, among foundry workers at least, is not raised

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by dust exposure per se, but rises only after silicosis becomes definitely established. Control of the foundry hazard is believed to be best accomplished by elimination at its source of the dust generated by sandblasting, sand chipping, sand grinding and shake-out operations. Combined with this, pre-employment and periodic examinations are essential so as to prevent tuberculous individuals from carrying on a dusty trade and to discover new infection and reactivation cases as they arise.

- 416 ISOLATION OF THE MINERAL DUST IN THE LUNGS AND SPUTUM. N. Sundius and A. Bygden. J. Ind. Hyg. & Toxicol. 20, 351-9 (May 1938). Authors are Swedish and we have no information on reprints.

The authors discuss various methods for the separation of mineral dust from lung tissue, pointing out their disadvantages in that they may alter the composition of the dust. They recommend treatment with perhydrol (concentrated hydrogen peroxide) as avoiding material decomposition of the original dust. Organic acids may be generated during the decomposition process, but their action is weak, except on carbonates, which are mostly dissolved. The characteristic ingredients of asbestotic lungs, the "asbestos bodies", however, are more resistant and undergo no morphological changes, but the organic matter contained in their envelopes is chemically attacked and more or less destroyed. The method was found useful in separating iron ore dust in sputum in a practically unchanged state. In cases where the lung dust contains carbonates or if asbestos bodies are to be isolated without chemical alteration, only a purely mechanical method is applicable. For this purpose a procedure has been practised comprising a fine grating of the lung and a subsequent separation of the mineral contents and the asbestos bodies from the organic matter by centrifuging in heavy liquids, among which acetylene tetrabromide diluted with benzene has proved particularly useful. This mixture may also be used to remove carbon from the mineral constituents.

- 417 THE BIOCHEMISTRY OF SILICIC ACID. V. THE SOLUTION OF SILICA AND SILICATE DUSTS IN BODY FLUIDS. E.J. King and M. McGeorge. Biochem J. 32, 417-425 (Feb. 1938). Reprints probably obtainable from Banting Institute, Toronto, Ont.

The solubility of silica in various liquids has been given considerable study, with widely varying results by many workers. The authors discuss some possible causes of these differences and describe their own method in detail. The solutions used were blood serum and ascitic fluid. The dusts used were quartz, flint, feldspar, asbestos, sericite, amorphous silica, fuller's earth, kaolin, talc and several air-borne dusts. The results show that free silica dissolves more quickly than silicate minerals, indicating the possibility that alkaline earth silicates dissolve slowly in alkaline media, while the slightly acidic nature of free silica may favor its solution in alkaline liquids.

- 418 THE BIOCHEMISTRY OF SILICIC ACID. VI. THE SOLUTION AND EXCRETION OF SILICA. E.J. King and M. McGeorge. Biochem. J. 32, 426-433 (1938).

The authors have attempted to correlate urinary excretion of silica with the quantity administered orally, intraperitoneally and intratracheally. Cats were used in all experiments. The materials used were quartz, flint, feldspar, sericite, fuller's earth, talc, steatite and several other dusts. Silica determinations in the urine were made by King and Dolan's method, which is described in this paper. The authors found that the greatest increase in urinary output of silica followed the administration of free silica, especially oral. Some of the silicates were unaffected while others were partly decomposed. No conclusion could be drawn from the experiments on inhalation.

- 419 EXAMINATION OF PNEUMOCONIOSIS IN QUARTZITE QUARRIES. K. Koetzing. Arbeitsschutz, pp. 59-62 (1938). (German).
The author examined 70 workers in quartzite quarries east of Magdeburg, which contain over 90% free silica. He found markedly enlarged heart in many cases, also early eczema and widespread silicosis in various stages. Illustrations and case descriptions are given, but exact figures are omitted.
- 420 ASSESSMENT OF TUBERCULOSIS AND SILLICOSIS WHEN THEY ARE COMBINED. A. Boehme. Med. Welt 12, 430-32 (1938). (German).
The author first discusses mortality incidence among persons exposed to quartz dust. In a silicotic lung, tuberculosis frequently begins with an infracalicular spherical focus which grows slowly, finally breaks down and spreads quickly. Sometimes small acicular foci are in evidence, often many hematogenous dispersed foci. This latter form is often the basis for the mistaken conclusion that silicosis is only a form of tuberculosis. Tuberculosis can be cured in an existing silicosis. The assessment of pneumoconiosis according to the German law of April 1, 1937 is described.
- 421 SILICOSIS AMONG METAL MINERS IN WESTERN AUSTRALIA. K.R. Moore. Med. J. Australia 1, 147-153 (Jan. 22, 1939).
A detailed analysis of the results of annual examinations of Kalgoorlie gold miners since 1925 is presented. Two radiographic types of pulmonary fibrosis have been observed among these workers, one of which is considered to be relatively pure silicosis and the other silicosis modified by a toxic or infective element. Pulmonary tuberculosis may be found with either type and it is a secondary factor in the first, while it probably pre-exists and determines the second type. The author considers the first type due to the unaided action of silica. It begins as a uniformly distributed exaggeration of the normal marking of the lung. This stage is followed by the development of a fine uniformly distributed nodulation with varying degrees of intensity. "Anomalous shadows", probably of infectious origin, were seen in 53% of the cases, and over 66% developed superimposed active tuberculosis. All of this group were more or less disabled, probably from mechanical effects upon the right heart. In the second or coarse type of nodulation, believed by the author to be predetermined by lung conditions before nodular shadows are apparent, the exaggerated linear pattern is irregular in outline and much less clearly defined. The "anomalous shadows" occur in 70% of the cases. The nodules are larger, with a tendency to coalesce, develop more rapidly, and produce disability from intoxication. Although the incidence of localized lesions diagnosed as tuberculosis or silico-tuberculosis is only half that in the first group, the author believes that "the coarse type represents the development of a silicosis modified from the outset by some other factor, presumably infection, and in all probability infection by the tubercle bacillus".
- 422 A FUNCTIONAL TEST IN CHRONIC PULMONARY DISEASE. B.H. Schlomovitz, A.B. Thompson and L.G. Glickman. Am. Rev. Tuberc. 37, 369-80 (April 1938). Reprints probably obtainable from Dr. Schlomovitz, 710 N. Plankinton Ave., Milwaukee, Wis.
The authors studied the variation in post-exercise excess oxygen absorption in normal subjects and in patients with several cardiac and respiratory diseases, including silicosis. The closed circuit apparatus was used for the measurement of oxygen consumption during the recovery period of 6 minutes. Normal individuals were found to have an average oxygen usage of 765 c.c. per sq. m. of body surface area; in emphysema and second stage silicosis the usage was materially lower, 371 to 697 c.c. in silicosis, while in heart disease it was higher than normal. When both heart disease and silicosis or emphysema were present, the oxygen usage was nearer to normal than it was in the presence of either disease. The authors feel that this clinical respiratory procedure is an adequate efficiency test, since it indicates the presence of a functional or physical disability.

- 423 ROENTGENOGRAPHIC STUDIES OF THE EXCRETION OF DUSTS FROM THE LUNGS. A.C. Barclay, K.J. Franklin and R.G. Macbeth. *Am. J. Roentgenol. & Rad. Therapy*, 39, 673-86 (May 1938). We have no information about reprints, but they may be obtainable from Dr. Barclay, Nuffield Institute for Medical Research, Oxford, England. Bismuth carbonate, powdered lead glass, and bismuth subnitrate were insufflated into the lungs of cats, and the process of excretion was watched radiographically. They were not carried further into the lungs than the distal termination of the ciliated epithelium. The bismuth carbonate and subnitrate were excreted in 1 to 4 days; the glass in 7 hours to 2 days. When the dusts were mixed with various liquids (dilute acetic acid, saline and dilute syrup), they passed on into the alveoli, from which they were slowly excreted over periods of weeks. There was no roentgenologic evidence that the dust in these fluids passed into the lymph nodes during their excretion. The particle size range of the bismuth carbonate was 3 to 12 microns, but it tended to agglomerate in the presence of even a small amount of moisture. The lead glass particles ranged from 7 to 45 microns. A second glass preparation, averaging under 5 microns, was so acid in reaction as to introduce complications in the tests. (On account of the comparatively large particle sizes of the lead glass dust, the results seem to have little direct bearing on silicosis. The particles that may be phagocytized and carried into the lymphatic system are much smaller than would be discernible under the x-ray-Abstractor.)
- 424 RADIOGRAPHS OF SIXTY CASES OF SILICOSIS. M. Conrozier and J. Magnin. *Archives d'Electricite' Med. et de Physiotherapie du Cancer*, (Dec. 1936). Translated by E.R. Hayhurst. *Ind. Med.* 7, 239-41 (May 1938). No reprints. The authors conducted an intensive study of pneumoconiosis among the miners of the Gard basin in Southeastern France, and in this paper discuss some of their conclusions. They present arguments for the existence of silicosis as a disease distinct from tuberculosis, which would be unnecessary for American readers but were needed against the opposition of a number of French authorities. They also mention the tumor-like formations in some cases, considered more fully in the next paper. They also oppose basing a diagnosis of silicosis on the evidence of one roentgenogram, and emphasize the need of clinical as well as roentgenological examination. The 8 x-ray pictures presented in the original paper are not included in the translation.
- 425 TUMOR-LIKE IMAGES IN SILICOSIS. M. Conrozier and J. Magnin. *J. Radiol. et Electrol.* 21, 433-43 (October 1937). Translated by E.R. Hayhurst. *Ind. Med.* 7, 179-82 (April 1938). No reprints. The authors present roentgenograms of 30 cases of silicosis assembled over a period of 8 years, among rock miners in the Gard Basin of France. (The roentgenograms are described but not illustrated in the translation.) In all these cases, massive, dense, cleanly-cut blocks occur in the pulmonary fields, always bilateral but often affecting one lung more than the other. They are usually freely detached from both the hilum and the periphery, and framed on all sides by transparent parenchyma. They resemble sarcomatous metastases, appear to be distinctive and peculiar to silicosis, and call to mind clearly and uniquely the idea of tumors. Three categories are suggested by the tumors: (1) sarcoma; (2) subaxillary pachypleuritis, and (3) tumors associated with miliary shadows. The subjects are usually vigorous and muscular without evident defects, and without tubercle bacilli in the sputum. Dyspnea, however, is common. The authors argue that the condition described constitutes a type of silicosis distinct from the ordinary nodular form; that it is not caused by an aggregation of nodules, and that the appearances are not those of healed tubercular lesions.

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- 426 TUBERCULOSIS IN NATIVE EMPLOYEES OF THE GOLD MINING INDUSTRY (RAND). A.D. Pringle. Brit. J. Tuberc. 31, 136-140 (July 1937).
Tuberculosis was very prevalent among mine workers up to about 1925 but since that time there has been a remarkable improvement in both the incidence and the death rate. The causes contributing to this result are the development of medical supervision and improvements in hygiene and care of miners. New workers are placed on light work before being set to heavy work, and begin at the higher levels. The employment of native health visitors has proved successful.
- 427 THE CURE AND AFTER-CARE OF THE TUBERCULOUS AMONG THE EUROPEAN MINING POPULATION OF THE RAND. A.D. Pringle. Brit. J. Tuberc. 31, 144-9 (July 1937).
The procedures for medical inspection of miners and for compensation and care of tuberculous and silicotic miners are described. All Europeans applying for mining employment must be passed by the Medical Bureau. Miners are examined every 6 months. When fibrosis or silicosis is detected, the miner is warned of his condition and may decide whether he leaves underground work, but if tuberculosis is disclosed he must cease working underground. In the latter case he receives lump sum payments but no legal pension. Ex-miners capable of light work on the surface are found employment, and there is an employment bureau solely concerned with ex-miners. Grants are made to industries that guarantee to employ the children of ex-miners, who also have the first call for employment of mining apprentices. Funeral expenses for miners included under the provisions and part of the miner's pension is continued for the widow and all children under the age of 16. There were about 5,000 beneficiaries about a year ago. There has been a 20% reduction in the production rate of silicosis, which will later mean a reduced prevalence of tuberculosis.
- 428 THE PLACE OF OCCUPATIONAL THERAPY IN THE TREATMENT OF TUBERCULOSIS. G. Langmaid. Brit. J. Tuberc. 31, 199-202 (July 1937).
The purposes of occupational therapy in the treatment of tuberculosis are, the building up of the general physique and furnishing a livelihood. Vocational guidance is valuable in fitting patients for the most suitable jobs.
- 429 PNEUMOCONIOSIS AND PULMONARY CANCER. C.S. Anderson and J.H. Dible. J. Hygiene 38, 185 (1938).
In the examination of 70 lungs of persons who had died of cancer of the lung and 50 without lung cancer, a high average silica content was found in the cancerous lungs, a total of 0.60 g. in latter against 0.26 in the controls. However, the high average was due entirely to the silica content of 12 of the 70 subjects, 7 of whom were undoubtedly silicotic, and there were no cases of silicosis in the controls. The evidence is therefore admitted to be inconclusive, but the authors recommend fuller study.
- 430 CHRONIC LUNG CHANGES IN ELECTRIC ARC WELDERS. Norbert Enzer and O.A. Sander. J. Ind. Hyg. and Toxicol. 20, 833-50 (May 1938). Reprints obtainable from Dr. Enzer, Director of Laboratories, Mt. Sinai Hospital, Milwaukee, Wis.
Chronic lung changes have been known to occur after prolonged exposure to welding fumes, and one of the authors has studied such changes clinically and radiographically in a group of welders for 3 years. In 5 of a total of 26 men, nodular shadows were seen which simulated a modified type of silicosis, and in 5 others, the appearance resembled a pre-nodular fibrosis of the type seen in older foundry molders. Their occupational histories did not include severe exposure to silica dust. It was learned that the men whose lungs displayed the shadows had welded inside tanks, without ventilation, so that their exposure to welding fumes was much more severe than the others who had worked in the ventilated rooms. Typical case histories are given. Finally an autopsy was performed on a workman

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who had died of pneumonia 14 months previously, but whose lungs were well preserved. The findings are given in detail. Those of the most significance were the accumulation of iron in large quantities, the presence of silica in only a normal quantity, and the absence of fibrosis or of damage to the blood vessels. In living subjects, no increase of shadows was found after the substitution of coated rods for bare iron rods in welding. Functional impairment of lungs with such iron deposits seems to be entirely lacking, both as to the development of clinical symptoms and susceptibility to complicating infections. A study of the photomicrographs demonstrates that iron deposits may easily be diagnosed as anthracosis unless the lesions are chemically analyzed. The cases presented, then, are typical of true "siderosis", a term which the authors restrict to mean the deposit of iron dust in the lungs and to exclude the concept of fibrous tissue reaction. It is, therefore, analogous to anthracosis and entirely different from silicosis.

- 431 HEALTH HAZARDS FROM CEMENT DUST AND WET CONCRETE. Educational Health Circular, Industrial Health Series No. 1. Illinois State Dept. of Public Health, Springfield, Ill. 8 pp. Obtainable free from that Dept. on request of citizens of Illinois.

The types of disability that occur to men working with Portland cement include: (1) irritation of the respiratory tract from breathing dry cement; (2) irritation or burning of the skin, commonly called "cement burn"; (3) conjunctivitis or irritation of the eyes; (4) clogging of the ears; and (5) rheumatic conditions. Each hazard is discussed in some detail, including causes and methods of prevention. Cement workers, like others in dusty occupations, are especially subject to certain respiratory diseases as influenza, bronchitis, asthma and pneumonia. Silicosis is not a hazard in this industry on account of the low free silica content of the dust. The action of cement on the skin is both chemical and mechanical, and dermatitis may arise from various sources. However, skin injury is not easily acquired unless abrasions are present, the skin is hypersensitive, cleanliness is neglected, or the contact is continued for a long period. Apparent cases of partial deafness have been found to be due simply to clogging of the ears by dust. Rheumatism, neuritis and arthritis occur among workers exposed to dampness or extreme temperature changes. Among the obvious methods of prevention of all of these hazards are dust control, personal cleanliness, suitable clothing, reporting of injuries, and information about the hazards.

- 432 NECROPSY EVIDENCES ON THE RELATION OF SMOKY ATMOSPHERE TO PNEUMONIA. Samuel R. Haythorn and Harry B. Meller. Am. J. Pub. Health 28, 479-86 (April 1938). Reprints available at this office.

A relationship has long been suspected between smoky atmosphere and pneumonia, and this paper presents a study of necropsies of 3,000 patients who died of pneumonia in Pittsburgh. The cases were separated into 5 grades of anthracosis depending upon the amounts of extraneous pigment and the fibrosis present. Grades 0, I and II appeared to have no particular occupational basis. Grade III was a mixed occupational and non-occupational group. Grades IV and V were largely, though not exclusively, occupational. The incidence of pneumonia of all forms and of lobar pneumonia was tabulated in relation to each grade of anthracosis. In spite of the high local pneumonia death rate, no anatomical evidences of a relation between the incidence of pneumonia and the milder grades of anthracosis in the non-occupational groups could be demonstrated. In grades III to V there was a definitely higher percentage of pneumonia cases, but the average age for each of these grades coincided with the period of life at which the pneumonia death rate in less smoky communities is likewise highest. Healing by organization, i.e. a type of healing in which the exudates organize as in the

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healing of a wound, without the occurrence of a crisis, was consistently higher in all of the more advanced grades of anthracosis and greatest in grade V. The organizing foci appeared to be associated with heavy pigment in deposits, microscopic areas of fibrosis, and isolated emphysematous pockets in fibrosed portions of the lungs. Statistics for pneumonia deaths in Pittsburgh over a 10 year period show a correlation with industrial activity, but also show that the death rate for females varies from year to year in the same direction as that for males, indicating that the variations may be related to atmospheric conditions and not merely to industrial exposure.

- 433 INDUSTRIAL EXHAUST VENTILATION. PIPING DESIGN. John L. Alden. Heating & Vent. 35, 45-7, 74. No reprints. See note on earlier papers.
From a pneumatic standpoint, the design of a system of exhaust piping embraces the determination of: (1) the static suction at each hood; (2) the air volume entering each hood; (3) the volume rate of flow in each length of pipe; (4) the velocity in each length of pipe; (5) the total air volume to be handled by the fan, and (6) the static suction and back pressure at the fan inlet and outlet respectively. Knowledge of all these points is essential to proper design. A procedure for piping design is suggested, involving a sketch of the floor plan, calculation of the velocity, suction or volume at each hood by freehand sketches, and arriving at an approximate estimate of the branch line pipe sizes and totals. Then several possible plans are drawn, and the best one is selected. Pressure losses, volumes, velocities and pipe sizes are then calculated accurately and drawings and preparations for actual construction are then made. A careful recheck of all observations and calculations is necessary. An example of a layout is presented, with calculations in some detail. Methods of increasing hood suction are given. If an exhaust system is purchased, it is well to check its efficiency by the methods suggested.
- 434 MAINTENANCE ROUTINE FOR A DUST CONTROL SYSTEM. Donald E. Frazier. Heating Piping & Air Cond. 10, 309-13 (May 1938). No reprints.
The use of dust arrestor equipment has been stimulated by the ever increasing legislation intended to improve plant working conditions, but without the proper care and maintenance expensive dust collecting systems fail to achieve their purpose. The air cleanliness throughout the mill is a yardstick by which the arrestor efficiency is best evaluated. In the plant under consideration, a weekly inspection includes dust counts in working places, manometer readings at various places in the piping systems, especially across the filters, and examination of the pipes for leaks. An annual survey is also made by an outside engineer. The impinger is generally used for the dust counts, but it has been supplemented by the use of another instrument. A check-up such as described should be followed by replacement of worn parts. Tabulated examples of air velocities and volumes are included.
- 435 REMOVAL OF SUSPENDED MATTER FROM INDUSTRIAL GASES. Robert Rogers Harmon. (Abst. ref.) Chem. Age (London) 38, 385-7 (May 14, 1938).
A general discussion of methods of removing dust from gases and their relative disadvantages is followed by a description of the Peabody system, which utilizes equipment patented by the author, and is claimed to have a high efficiency without using any other method than humidification and impingement. A spray from a rotary disk is so directed that the use of a comparatively small amount of water removes a large quantity of the dust from the gas. The gases are then kept above the maximum dew point by circulation of hot water, and are finally cooled in stages, with impingement and collection of the dust at each stage.

References to Recent Literature - 11

- 436 SCALING OF HEAT-TREATED IRON AND STEEL PARTS. A NEW SUBSTITUTE FOR SANDBLASTING. G. Klebs. Zbl. f. Gewerbehyg. 15, 82-86 (1938). (German).
The author describes a cleaning method according to German patent specifications, which is in use by the Bullard Co., Bridgeport, Conn. Pieces are scaled by pretreatment in a bath in which diluted acid serves as the electrolyte, lead plates as anodes, while the previously cleaned parts act as cathodes. The danger of formation of arsine may be avoided by the use of arsenic-free material, and lead poisoning may be similarly avoided. The author claims a hygienic advantage by rendering sandblasting unnecessary.
- 437 DUSTLESS FLOORING; RANGE OF SUITABLE MATERIALS. J. Castley. Times Trade and Eng. 42, No. 888 Factory Welfare Section, P. IX, (Feb. 1938).
The (British) Factories Act requires that floors shall be soundly constructed and properly maintained, efficiently drained when wet processes are conducted, and kept clean. The author discusses the virtues and faults of different types of floor material. He recommends granolithic with a metal hardener, mastic asphalt with granite chips or steel mesh, hard unglazed tiles and blue bricks grouted in hot bitumen for heavy wear. Magnesite oxychloride cement is also good in dry locations. Rubber and a plastic mixture of latex and cement are valuable in many instances. These types are all preferable to concrete.
- 438 STANDARDS FOR THE TESTING OF WET-DRILLING EQUIPMENT AND WET METHODS. New York State Dept. of Labor. Indust. Bull. 17, 63-64 (1938). Copies available from the Department's office, 80 Centre St., New York City.
The rock drilling code of New York State was published in Industrial Bulletin in May, 1937. The present code defines wet drilling (with ventilation) and specifies the types of hygiene facilities to be provided. Wet drilling is not permitted below 32° F unless anti-freeze solution is used. The water flow must be continuous and the hole in the steel must not be below 3/16 inch. Class I rock, (under 10% free silica) may be drilled without applying any mechanical ventilation under suitable restrictions, but additional measures are necessary in class II rock (over 10% free silica). In open areas, direct blowing of air through the drill steel is prohibited. In confined areas, the rock within 30 feet of the drilling area must be kept damp and ventilation of the drilling region at rates of 500 to 2,500 c.f.m. per drill is required. Recirculation of the ventilating air is permitted, providing dustiness is controlled. The ventilation rates given are contingent on reduction of dust to safe limits as shown by dust counts.
- 439 REMOVAL OF DUST AND FUMES; NEW DEPARTURES. C.W. Price. Times Trade and Eng. 42, No. 888, Factory Welfare Sect. P.X (Feb. 1938).
The paper draws attention to the provisions of the new (British) Factories Act regarding removal of dust and fumes. Means for collecting dust removed by ventilation are not specifically required, but no installation can be called satisfactory unless such means are provided. The author warns against ready acceptance of percentage efficiencies which are given without consideration of the smaller and more dangerous particles. Unduly optimistic claims for bag filters have led to their installation, although they are not efficient for small dust particles, and the practice is contrary to the spirit if not the letter of the law.

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- 440 **DISABLING SICKNESS AMONG MALE INDUSTRIAL EMPLOYEES DURING THE FINAL QUARTER OF 1937 AND THE ENTIRE YEAR.** W.M. Gafafer and E.S. Frasier. Pub. Health Repts. 53, 819-23 (April 8, 1938).
For the year 1937 as a whole, the frequency of sickness and non-industrial injuries in the United States rose to the highest point since 1929, namely 99.7 per 1000. Tuberculosis was the only exception to the general rule, showing a slight decrease. For the final quarter of 1937, the total frequency was slightly lower than for the final quarter of 1936. Pneumonia was higher by 36%, but other respiratory diseases were lower by 12%. In a graph showing each disability for the years 1933-1937, the respiratory diseases show a gradually increasing trend, while others are substantially level.
- 441 **INDUSTRIAL DISEASES IN 1935-1936.** Arbeitsschutz 62-9 (1938). (German).
In addition to the usual statistics are brief reviews of unusual cases, including the following: chloroform; diseases of electric workers who work with electrodes having a flux containing fluorspar; poisoning from phosphine in an insecticide for destroying grain weevil; arsine poisoning in the production of zinc sulfate; sickness from polishing and turning of light metal parts; lead poisoning in a zinc smelter where zinc was treated electrolytically; trichlorethylene and carbon tetrachloride poisoning; increasing benzene cases; lung changes in an aluminum cutter and in a worker who had inhaled talc dust for 35 years; skin diseases from vulcanizing accelerators, and injury from oxygen deficiency in containers holding chemical residues.
- 442 **REPORT OF THE MEDICAL RESEARCH COUNCIL FOR THE YEAR 1936-37.** H.M. Stationery Office, London, 1938.
This annual report, which covers British progress in the whole field, contains several items of industrial interest. In extension of earlier work on the adsorption of tuberculin by coal dust, a number of other mineral dusts have been examined in the same way. They all possessed some adsorptive activity, but it was very slight in the case of coal dust. Finely divided anthracite dust and fusain (the dustiest ingredient of bituminous coal), on the other hand, were found to be potent adsorbing agents, and it is possible that this may explain the relative immunity of coal miners with silicosis to the toxic effects of tuberculous infection. Other investigations that are under way include: an occupational study among coal miners in South Wales; study of the pathology of pneumoconiosis; work on the nature and extent of bronchitis produced by inhaling various irritants, and research on the chemical aspects of silicosis. Several other investigations that are reviewed have been presented in earlier abstracts in this bulletin. They include the work on the use of porous solid filters for dust sampling, preliminary study of the toxicity of industrial organic solvents, and experiments on the production of tumors from tarred road dust.
- 443 **OCCUPATIONAL DISEASES AND THEIR RELATIVE IMPORTANCE TO MEDICAL PRACTICE.** Robert T. Legge, Rocky Mountain Med. J., (March 1938); Ind. Med. 7, 217-24 (April 1938). Reprints obtainable from Dr. Legge, Professor of Hygiene, University of California Berkeley, Calif.
This is a general address covering the field of occupational diseases, including poisoning, dermatitis and silicosis, and urging greater attention to occupational diseases, promotion of safety measures, and establishment of State laboratories of industrial hygiene. A significant statement is that "it is time for the profession to be able to interpret the nature of phenomena in the worker who possesses a history of contact with any chemical hazard, especially since these cases are now found in the home and on the farm as often as in industry." Toxic agents used as insecticides for spraying trees and garden plants are given as examples. (An earlier address covering the same general field was abstracted in our September, 1937 bulletin, abstract No. 425.)

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- 444 DEVELOPMENT OF AN INDUSTRIAL HYGIENE PROGRAM IN A STATE HEALTH DEPARTMENT. H.F. Eason and M.F. Trice. *Am. J. Publ. Health* 28, 610-5 (May 1938). Reprints probably obtainable from Dr. Eason, Director, Division of Industrial Hygiene, State Board of Health, Raleigh, N. Carolina.

The authors present an account of the Division of Industrial Hygiene of the North Carolina State Board of Health, including history, organization, functions and activities. The Division was organized in 1935, coincidentally with the amendment of the Workmen's Compensation Act to include occupational diseases, with the assistance of U.S. Public Health Service. The Division is supported by the Industrial Commission, but is an integral part of the Health Department. Preliminary surveys of a number of industries have been made, including foundry and machine shops, mining and milling of talc, granite quarries, newspaper establishments, brick plants and a cotton mill. A rational policy for acceptance or rejection of prospective employees on examination has been adopted. Suggestions are made relative to the type of work the employee may perform safely. Copies of the report on every person examined prior to employment are sent to the employer, the Industrial Commission and the Compensation Rating and Inspection Bureau. Combined engineering and medical reports are sent to these departments and to the Labor Department. A most amicable and cooperative liaison exists between all departments that are concerned with the problem of industrial hygiene.

- 445 A LABORATORY SAFEGUARDS HEALTH. E.H. Gilman. *Nat. Safety News* 37, 23-24 (May 1938).
The author describes methods of detection of dust and other hazardous substances in the Goodyear plant. The Bausch and Lomb counter is generally used for dust determination, after correlation with the impinger, but the latter is preferred for high concentrations. The dust is analyzed for free silica by the fluoboric method. Periodical physical examinations are given all employees exposed to dust above the safety limit. Plans for tests of respirators are being made. Standard methods are used for determination of benzene and chlorinated hydrocarbons in the air. Carbon monoxide, hydrogen sulfide, carbon bisulfide and sulfur chloride are watched for by the application of simple tests. Physiological tests for the presence of benzene and lead are made in cases of exposure. The set-up of the industrial hygiene laboratory provides an opportunity for experimental work in connection with the medical staff to improve methods for detecting toxic conditions and poisoning. Plans of this type are being made.
- 446 EMPLOYEE EXAMINATIONS. *Med. Economics* (March 1938). *Ind. Med.* 7, 227 (April 1938).
After calling attention to the need of physical examinations of employees, especially of small companies, this editorial advises medical societies to urge local employees to retain reputable medical examiners. Wholesale solicitation of such practice is out of the question, but various publicity methods may be properly used, as they have been in past campaigns for vaccination, diphtheria prevention, immunization and other preventive measures.

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

- 447 HYPERPYREXIA FROM CARBON MONOXIDE OR INFECTION. *J. Am. Med. Assoc.* 110, 230 (January 15, 1938). (Queries and minor notes).
Attacks of chills and fever with gastric disturbances and tightness of chest followed a nearly fatal exposure to carbon monoxide, and all blood tests gave normal results. The reply to an inquiry about the case points out that sequelae to carbon monoxide poisoning are often bizarre and this may be such a case. Pyelitis is suggested as a possibility but in the absence of a discoverable infection "it becomes reasonable to accept this condition as an unusual sequel of severe acute carbon monoxide poisoning, traceable to vascular changes within the brain or its covering."

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- 448 A FATAL CASE OF ILLUMINATING GAS POISONING. Peter Stanke. *Feuerschutz* 19, 33-4 (1938).
Illuminating gas escaped from a broken pipe line and filtered through the ground. The warning odoriferous ingredients were thereby removed, but the carbon monoxide remained.
- 449 POISONING BY EXPLOSION GAS IN THE OPEN AIR. H. Oettel. *Samm. v. Vergiftungsf.* 9, 1-2 (1938). (German).
A grenade fell in a Chinese dugout. The soldiers in the enclosure were not injured but lost consciousness. Two died 12 hours later, and in their blood, shortly before death, 75% and 65% carbon monoxide hemoglobin were determined. The author explains these high values so long after exposure by the fact that breathing was hindered by choking due to nitrous gases produced in the explosion, causing an early lung edema and protracting the poisoning.
- 450 EXACT DETERMINATION OF HEMOGLOBIN AND RED BLOOD COUNT AFTER CARBON MONOXIDE POISONING. K. Humpferdick. *Arch. f. Gewerbepath. u. Gewerbehyg.* 8, 464-468 (1938). (German).
The author reports that out of 21 persons examined, who had survived acute carbon monoxide poisoning or who had been exposed to rather large amounts of carbon monoxide, 13 had a red blood count of over 5 million. Some showed strikingly high values. Polyzitobulia was present in 4 out of 16 lead workers.
- 451 A COMPARISON OF THE TOXICITY OF CARBON TETRACHLORIDE AND TRICHLOROETHYLENE. H.M. Barrett, D.L. MacLean and J.C. Cunningham. *J. Ind. Hyg. & Toxicol.* 20, 360-79 (May 1938). Reprints obtainable from The School of Hygiene, University of Toronto, Toronto, Ont.
An investigation of the effects on guinea pigs of over 1100 hours exposure to 1200 p.p.m. of commercial trichlorethylene vapor showed no demonstrable change in the lungs, kidney, heart, adrenals or brain. Very slight degenerative changes were observed in the liver in a few cases. Subcutaneous injection resulted in pulmonary edema in 3 of 8 rabbits, but no characteristic pathological picture was produced. Smyth's observation on the marked susceptibility of guinea pigs to carbon tetrachloride was corroborated (Our Abstract #130, 1937). Previous exposure to trichlorethylene did not render rats and guinea pigs more susceptible to carbon tetrachloride. Experiments with large groups of rats showed the narcotic power of ethylene trichloride to be somewhat greater than that of carbon tetrachloride, and the results in general show carbon tetrachloride to be a considerably more toxic material than trichlorethylene. A review of the literature on trichlorethylene poisoning indicates the existence of very few instances of permanent damage resulting from its use, and these were associated with exposures to intoxicating concentrations. It is concluded that no limit for a safe concentration can at present be set on the basis of animal experiments, but that the margin of safety for trichlorethylene exposure is probably greater than for carbon tetrachloride.
- 452 HEPATO-RENAL SYNDROME IN CARBON TETRACHLORIDE POISONING. H. Schuetz. *Arch. f. Gewerbepath. u. Gewerbehyg.* 8, 469-500 (1938). (German).
The author describes the clinical picture of delayed injuries after carbon tetrachloride poisoning, on the basis of 25 cases from the literature. After light general symptoms, which appear after 1 to 2 days, the first effects are those of liver intoxication. Renal symptoms--fall in diuresis and anuria--also appear early in the foreground of the picture. Finally there develops a uremia-like condition, coma and death. Pathologically and anatomically, the findings include liver parenchyma, fatty degeneration, necrobiosis of the liver tissue finally becoming cirrhosis, toxic kidney changes, fatty degeneration and necrosis of the tubules, and a nephrosis-like picture.

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- 453 **EXPERIMENTAL CIRRHOSIS: RELATION OF HEPATIC DAMAGE AND PLASMA PROTEINS TO ASCITES.** J.L. Bollman. J. Am. Med. Assoc. 110, 842 (March 12, 1938).
Cirrhosis was produced in dogs by long continued administration of carbon tetrachloride. Spontaneous ascites occurred only after extensive hepatic damage and was associated with definite changes in the plasma proteins. Ascites are produced by moderate plasmaphoresis. The extent of serum alterations necessary to produce ascites appears to be inversely proportional to the extent of hepatic damage.
- 454 **RETROBULBAR NEURITIS AND AMBLYOPIA CAUSED BY POISONS.** F. Terrien. J. des Praticiens 52, 177-181 (1938). (French).
A general discussion of retrobulbar neuritis is followed by a short report of a few cases, including those of 3 workers exposed to carbon bisulfide. The noticeable symptom was diminished vision, which disappeared quickly after they gave up work.
- 455 **RECOVERY OF SULFUR FROM SULFUR DIOXIDE.** R. Lepsoe and W.S. Kirkpatrick. Pulp Paper Mag. Can. 39, 20-2, 54 (1938).
A general picture of the development and installation of the sulfur dioxide plants of the Consolidated Mining and Smelting Co. of Canada, at Trail, B.C.
- 456 **HAZARDS OF ELECTRIC WELDING.** E.G. Meiter. Bulletin. 4 pages, issued by Employers Mutuals, Milwaukee, Wis., and obtainable on application to them.
This pamphlet is a concise summary of the hazards of electric welding and methods of protection. The hazards fall under the following headings: (1) electric shock and burns; (2) radiant energy; and (3) gases and poisonous fumes or dust. The greatest electric shock hazard occurs in changing electrodes without shutting off the current, which should be attempted with full insulating protection if at all. A fireproof apron should be worn as protection against metal sparks and globules; and leggings, sleevelets, gloves and shoe protection are also desirable. The dangerous part of the radiant energy includes the ultra-violet and infra-red rays, which are harmful both to eyes and to skin, and a face shield or head shield is essential. Welding operations should be conducted in enclosed spaces for the protection of others than the operator. The atmospheric hazards include gases, especially nitrogen peroxide, and metallic or mineral oxides volatilized by heat from the materials welded. In addition to the metals welded, the rods are coated with secret preparations for prevention of undue oxidation of the metal. These sometimes contain siliceous material such as asbestos, and silica is found in the fumes, but the free silica content is unknown. Prevention of the respiratory hazard involves general ventilation, respirators and air-supplied helmets, the last especially where lead fumes are present.
- 457 **WELDING HAZARDS.** T. Lyle Hazlett. Safety News (house organ of Medical Dept. of Westinghouse Electric & Mfg. Co.), (May 1938).
The author classifies the hazards as follows: (1) fumes, smoke and gases; (2) radiation from the arc; (3) fire, and (4) electric shock. There is little health hazard from fumes, smoke and gases in welding of ordinary iron and steel under adequate ventilation, but danger arises when the welding is conducted in closed spaces. Other metals such as lead and cadmium introduce a poison hazard. Adequate forced ventilation and supplied air respirators are the best protective measures. The author stresses the same points in fire and radiation protection as in the preceding abstract, but points out also that standards have been set up covering the type of lens which should be used to protect the eyes on different kinds of welding, and that only lenses meeting the Federal Specifications standard should be purchased for protection of welders. The danger from shock in changing electrodes is emphasized, with the additional caution that welding sets that use only a resistance or reactance in series with a high voltage line such as 220 A C or 550 D C present a real hazard and should not be

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used. Open circuit volages on any set should not be over 100, and preferably much less. If a person is "knocked out" from electrical shock, artificial respiration should be begun at once.

- 458 POTASSIUM CYANIDE AND HYDROCYANIC ACID POISONING. B. Ostmann. *Samm. v. Vergiftungsf.* 9, 33-48 (1938). (German).
The author gives a general description of cyanide poisoning and reports on 19 suicides from potassium cyanide and autopsies on them. Reports from the literature on murder with these 2 substances are followed by cases of industrial poisoning, including gold platers, chemists and users of shoe polish. Poisoning during gassing operations is mentioned.
- 459 METHEMOGLOBIN IN POTASSIUM CYANIDE POISONING. C. Mladoveanu, O. Vasilco and P. Georghiu. *Bull. acad. med. Roumanie* 4, 527-9 (1937). Roumanian. A few more details available in Chemical Abstracts May 20th.
The property of methemoglobin to combine with hydrocyanic acid and potassium cyanide is well known, so the authors treated intoxications from these poisons with various methemoglobin preparations, with favorable results, especially when sodium nitrate was used. Transfusions alone were without effect.
- 460 CYANIDE ANTIDOTES. W.B. Paton. *Can. Mining J.* 59, 135-6 (1938).
Ammonium carbonate and ferrous carbonate (freshly prepared) are good antidotes. A widely used antidote consists of solutions of 57 g. anhydrous sodium carbonate per liter and of 150 g. ferrous sulfate per liter, which are preserved separately in stoppered bottles, mixed at the time of administration and a 50-cc. portion is given. Precautions, means of testing suspected atmosphere for cyanides and symptoms of cyanide poisoning are outlined.
- 461 THERAPY OF BENZENE INTOXICATION. G. Castrovilli. *Med. lavoro* 28, 106-11 (1937). Italian.
Guinea pigs were subjected to subacute benzene intoxication through the respiratory tract, and at the same time were injected 0.2 g. of vitamin C. The experiment was carried out for 1 hour a day during 4 months, the animals being placed in an atmosphere which, during the first 3 months contained 5.4 mg. benzene per l., and contained 25 mg. per l. during the 4th month. From the determination of the blood formula, the bleeding and coagulation times and the weight curve, it is concluded that ascorbic acid possesses an antagonistic activity toward benzene. As it is well tolerated by man, even in large doses, it can be administered without fear of hypervitaminosis.
- 462 PLEURAL EFFUSION FROM GASOLINE INHALATION. Rutherford T. Johnstone. *Ind. Med.* 7, 243-50 (May 1938).
The author presents a case of inhalation of a rather large amount of gasoline by sucking the liquid from a siphon, producing an unusual pathologic condition. The absence of gastro-intestinal symptoms precludes the belief that a perceptible amount entered the stomach. Radiographs showed the presence of a large amount of liquid in the pleural cavity, diminishing with abatement of the symptoms over a number of days until the patient was well. The fluid was sterile but had no odor of gasoline. The author draws no conclusion but calls attention to many questions raised and suggests that similar cases be reported to aid in the general picture.
- 463 INTOLERANCE TO TURPENTINE AND TO SUBSTANCES IN THE TERPENE GROUP. Ch. Flandin, H. Rabreau and Mlle. Ukrainczyk. *Bull. soc. franc. derm. syph.* 44, 315-24 (1937). French.
The authors report 24 cases of intolerance to turpentine among servants, painters and persons using resins and aromatic oils in pomades and perfumes. All persons found sensitive to resins were also sensitive to aromatic oils.

- 464 FATAL POISONING FROM DINITRO-ORTHO-CRESOL. M. Nordmann and C. Weber. Arch. f. Gewerbepath. u. Gewerbehyg. 8, 441-448 (1938). (German).
A fatal case of poisoning of dinitro-orthocresol is reported, arising in the production of an insecticide. Death occurred after 2-1/2 months' work and after an illness of 60 hours. The symptoms were unconsciousness, dizziness, vomiting, restlessness, intense perspiration and fever. Autopsy showed strong yellowish discoloration of the portions of the skin and respiratory tract most affected by perspiration, unusual dryness of all organs and brownish discoloration of fatty tissues. Dinitrocresol was found chemically in the organs. The authors believe the case to have been a chronic one that suddenly became exacerbated. Two other workers in the factory were ill and showed yellowish coloration and intense perspiration, but recovered after several weeks.
- 465 ACUTE NICOTINE POISONING IN MAN. M.S. Kobro. Ztschr. f. klin. Med. 133, 734-738 (1938). (German).
A case is reported in which an apprentice gardener sprayed about 400 liters of 2% nicotine sulfate in a hothouse in 7-1/2 hours. He suffered headache, nausea, cramps, light cyanosis and bradycardia. He recovered fully in about 1-1/2 hours. Examination revealed hyperglycemia, leucocytosis, lymphopenia, high calcium value and lowered potassium value. All symptoms disappeared rapidly.
- 466 DETERMINATION OF ORGANIC VAPORS, USING THE METHOD OF ADSORPTION. Samuel Moskowitz and William J. Burke. Ind. Bull. 12, 168-9 (April 1938). Reprints obtainable from Div. of Industrial Hygiene, N.Y. State Dept. of Labor, 80 Centre St., New York City.
The determination of organic vapors by means of the interferometer has been described by the senior author (our abstract No. 58). The instrument, however, is rather expensive, and in the present paper an adsorption method is described. The use of activated charcoal has the difficulty of irregular changes of weight of the adsorption tube, which the authors find due to the high electrostatic charge which even gentle rubbing will produce. Silica gel does not present that difficulty and is recommended. Moisture and carbon dioxide are removed by Ascarite and Desicchlora. The adsorption train consists of a tube filled with those two substances, two with silica gel, and two more with Ascarite and Desicchlora, to absorb moisture and carbon dioxide liberated from the silica gel and to protect the exit end. The method has been found accurate to within 3 mg. Details of operation are given.
- 467 A GAS ABSORPTION APPARATUS. M. S. Nichols. U.S. Pub. Health Repts. 53, 538 (Apr. 8, 1938). Obtainable from Supt. of Documents, Washington, D.C., for 5 cents cash.
The author briefly describes a new type of gas absorption apparatus designed to give more intimate contact between a liquid and a gas being absorbed. It was first used in the absorption of carbon dioxide in a weak sodium hydroxide solution but has been more recently applied in the absorption of sulfur dioxide in iodine solution. It may have application in other similar absorbing processes. The apparatus consists of an ingenious arrangement of a common 2 quart Mason jar and a few test tubes. The jar is partly filled with the absorbing liquid and suction is applied through an opening in the rubber stopper. The path of the incoming gas is so directed by arrangement of the tubes that intimate contact and high efficiency are insured. The rate of sampling is 1 c.f.m. permitting tests on large volumes of air in a short time. A diagram accompanies the article.
- 468 A NEW APPARATUS FOR TRACES OF GAS. I. DETECTION OF HYDROGEN SULFIDE. R. Kraus. Z. anal. Chem. 112, 1-7 (1938).
An automatic instrument is described which represents an improvement over one previously described (in 1936). By means of clockwork, a circular disk of paper which has been impregnated with lead acetate is made to revolve past an

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open slit where the paper is exposed for a limited time to the action of the atmosphere. In this way a 24 hour record is made which tells the approximate concentrations of hydrogen sulfide at all times. It serves to detect and determine approximate quantities that can barely be detected by the smell and still are dangerous to workmen. It is recommended for excavation work, as in the building of tunnels.

- 469 HEALTH HAZARDS IN METAL SPRAYING. H.I. Miller, Jr., G.M. Hama, E.C. Urban and Philip Drinker. J. Ind. Hyg. & Toxicol. 20, 380-7 (May 1938).
This paper describes experiments on the health hazards involved in metal spraying, which is finding increased industrial uses. Copies of this paper are being distributed to members with this bulletin.

- 470 ACUTE LEAD POISONING: INDUSTRIAL. I. HISTORY AND PHYSICAL FINDINGS IN A GROUP OF 50 PATIENTS. Irving Gray and Irving Greenfield. Ind. Med. 7, 262-4 (May 1938).
In the group of patients studied, 41 absorbed lead fumes and lead dust by way of the upper respiratory tract, and 9 through the gastro-intestinal tract. An occupational distribution shows 35 riveters, 9 painters, 4 water tank cleaners, and 2 lead smelting employees. The riveters acquired the poison during construction in a practically enclosed space, and had worked many years previously in the open without injury. Lists of symptoms and of pertinent findings are presented. The predominant symptoms are referable to the gastro-intestinal tract. Acute lead colic is the most striking feature in the history. Myalgia and arthralgia are frequent. On physical examination, pallor is a prominent finding. Attention is called to the paucity of objective findings, including the absence of the lead line on the gum. A detailed history of the symptoms is essential in the diagnosis.

- 471 THE BASOPHILIC AGGREGATION TEST AS AN EARLY DIAGNOSTIC FACTOR IN LEAD ABSORPTION AND INCIPIENT LEAD POISONING. Muril C. Hyler and William R. Bradley. Ind. Med. 7, 184-93 (April 1938).
The authors have applied the basophilic aggregation test to 390 workmen grossly exposed through inhalation to dusts of metallic lead and freshly produced lead oxide, and also attempted to correlate the results with quantitative stippled cell counts. Lead was determined in the atmosphere at places of exposure by the dithizone method. Positive basophilic aggregation tests were established for all persons apparently absorbing lead in appreciable quantities and in all persons evincing symptoms and signs of lead poisoning. The extent of basophilic aggregation does not, however, correspond closely to the extent of lead poisoning. No precise correlation was established between basophilic aggregation counts and quantitative counts of pre-formed stippled cells. From the standpoint of time, economy, accuracy, uniformity and simplicity, the authors recommend the basophilic aggregation test in the examination of workers when seeking the detection of lead absorption and early lead intoxication. The data are presented in extensive tables.

- 472 LEAD POISONING IN 1936 AND EARLIER YEARS. F.L. Hoffman. U.S. Monthly Labor Rev. 46, 420-433 (Feb. 1938).
Encouraging progress has been made in the reduction of lead poisoning in this and other countries. In the United States, for instance, the rate has declined from 2.5 deaths per million population in 1900-1904 to 1.0 death per million in 1936, or 60%. This decrease is largely the result of improved sanitary conditions in factories, but improvement in the economic condition of work is also a contributing factor.

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- 473 PREVENTION OF LEAD POISONING. Educational Health Circular, Industrial Health Series No. 2, Illinois State Dept. of Public Health, Springfield, Ill. 15 pp. Obtainable free from that Department on request of citizens of Illinois. The circular gives concise information on causes, symptoms, diagnosis and prevention of lead poisoning. A list of 151 potentially hazardous occupations is given, and a flow sheet indicates the course of manufacture and use, from the lead ore to various finished products. A table of common signs and symptoms lists them under general appearance, digestive system, nervous system, miscellaneous damages, urine examination and blood changes, with indications under each for suggestive evidence of (1) lead absorption; (2) incipient intoxication and (3) more advanced or definite plumbism. Under preventive measures, exhaust ventilation, protective equipment, sanitation, good housekeeping, notices and instruction, inspection and medical examination are discussed.
- 474 CALCIUM AND MAGNESIUM IN THE PROPHYLAXIS OF EXPERIMENTAL LEAD POISONING. S. Maugeri and C. Santi. *Med. del Lavoro*, 29, 1-14 (Jan. 1938). (Italian). Rabbits injected intramuscularly with 1 cc. of 1% lead acetate per kilogram of body weight die of lead poisoning within 16 to 24 days. Other rabbits similarly injected but also intravenously injected with 15 cc. of 10% calcium gluconate have proved more resistant to lead poisoning, only one death occurring, while the others showed only a decrease in weight, in red cell count and in hemoglobin. A third group of rabbits treated intravenously with 0.5 cc. of 10% magnesium sulfate have shown no objective symptoms of lead poisoning. The magnesium treatment is recommended, because it favors the elimination of lead, while calcium causes its accumulation.
- 475 PLUMBISM AMONG CIGAR WORKERS. J. Am. Med. Assoc. (Netherlands letter) 110, 1123 (April 2, 1938). An investigation made in 14 cigar factories after the discovery of 41 cases of lead poisoning, disclosed 3 responsible factors: (1) the zinc sheets on which the cigars were cut; (2) factory drinking water, and (3) home water supply (from lead pipes). The latter cause was considered the most important. The public is advised to drain off water that has remained in lead pipes all night.
- 476 IRON RETENTION IN PERNICIOUS ANEMIA, LEAD POISONING AND MYXEDEMA. W.M. Fowler and A.P. Barer. *Arch. Intern. Med.* 61, 401-407 (March 1938). Iron was given medicinally to 7 patients, 2 of whom had lead poisoning. The iron retention varied from 25 to 34%, in one case of lead poisoning it was 25%.
- 477 THE RELATION BETWEEN RED CELL PORPHYRIN AND URINARY PORPHYRIN IN LEAD POISONING AND THE EFFECT OF CALCIUM AND OF MAGNESIUM. F. Capelli. *Med. del Lavoro* 29, 14-25 (Jan. 1938). (Italian). Calcium chloride injected intravenously in lead poisoning consistently decreases the porphyrin content of the red cells compared with urinary porphyrin. Magnesium sulfate has an action somewhat antagonistic to that of calcium. It is possible that increased elimination of lead from the system resulting from the presence of magnesium diminishes porphyrin formation.
- 478 MANGANESE POISONING IN INDUSTRY. Andre Feil. *Presse med.* 45, 1593-4 (1937). Manganese causes lesions of the nervous system leading to Parkinsonism, damage to the liver and probably to the kidneys. Clinical development, diagnosis and prophylaxis are discussed.

- 479 INDUSTRIAL CADMIUM POISONING. A REPORT OF FIFTEEN CASES, INCLUDING TWO DEATHS. F.M.R. Bulmer, H.E. Rothwell and E.R. Frankish. Can. Pub. Health J. 29, 19-26 (1938).
Two recent instances of industrial cadmium poisoning in Ontario are described. In the first, the poisoning came from welding cadmium plated switch boxes. In the second, 14 workers were affected and 2 died. Poisoning resulted from annealing cadmium plated rivets in a furnace operating between 1400° and 1500° F. Clinical descriptions are given.
- 480 CONTROL OF HEALTH HAZARDS. G.A. Coburn. Safety Eng. 75, 17-8 (May 1938).
The author briefly describes protective and prevention measures in use by the Delco-Remy Division, in various processes. Fumes from chromium plating are now efficiently collected by exhaust system which is an integral part of the plating equipment. In plating with other metals, forced exhaust ventilation has been provided. Six measures for prevention of lead poisoning in storage battery manufacture include (1) employment only of persons free from past lead exposure and digestive ailments; (2) isolation of operations giving off lead fumes; (3) wetting floors, paste machines and pasted plates; (4) control of lead dust in air by frequent analyses; (5) monthly physical examination of all exposed lead employees and transfer to another job at the slightest indication of leading; (6) requiring the use of respirators where lead concentration is above a safe point; and (7) insistence on personal cleanliness and hygiene. Soldering and bakelite molding operations are equipped with exhausts. Control of skin disorders of employees working in oils has always been a difficult problem, and the Company now attacks it in 3 ways: (1) a central supply system for oil, with a filter for used oil; (2) use of a protective hand ointment, and (3) program of cleanliness. Only one minor case of oil poisoning has occurred within the past year.
- 481 CHROMIUM NEPHRITIS AND DETECTION IN URINE. J. Am. Med. Assoc. (Queries and minor notes) 110, 1060 (March 26, 1938).
The inquiry concerns a worker who was in contact with "chromium oxide" fumes in his work, and who has an ulcer on the nasal septum, with albumin, blood, pus and casts in the urine. The reply to the question whether nephritis can be assumed states that the consensus is that kidney lesions are doubtful even though chromium can be detected in the urine. Quantitative determination of chromium in urine is difficult, but reference is made to a method capable of determining 0.003 mg.
- 482 CHRONIC ARSENIC POISONING FROM AN INSECTICIDE. T Schoendorf. Ztschr. f. klin. Med. 133, 713-721 (1938). (German).
The danger from arsenic in vineyard spraying is considered. Not only are the sprayers endangered, but the "house drink" made from the skins and seeds is drunk in large quantities by the peasants and often contains arsenic. Characteristic symptoms are described, including melanosis, liver injury, sometimes with cirrhosis and irritation of the respiratory tract. Polyneuritic symptoms, polyglobulia and hyperkeratosis were each found in a few subjects.
- 483 DAMAGE TO TEETH AMONG WORKERS IN AN ELECTROLYTIC ZINC PLANT. O. Guenther. Arch. f. Gewerbepath. u. Gewerbehyg. 8, 458-463 (1938). (German).
Symptoms of irritation among workers in an electrolytic zinc plant included nose-bleed, perforation of the nasal septum, inflammation of the upper respiratory tract, skin irritation, and erosion of teeth. These symptoms were apparently due to the action of acid mists and mixtures of zinc sulfate and zinc chloride solutions. As a preventive measure, covering the electrolytic bath with a protective fluid offers the best solution.

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- 484 EXPERIMENTS ON THE PROBLEM OF RADIUM POISONING. II. EXPERIMENTAL DETERMINATION OF RADIUM DEPOSITION IN THE HUMAN BODY. A. Janitzky, A. Krebs and B. Rajewsky. *Strahlentherapie* 61, 254-268 (1938). (German).
The authors report on a continuation of the work of Rajewski in 1936, on measurements of radium deposits in the human body as determined by autopsies on persons fatally poisoned by radium. The present report deals with two cases, one of lung fibrosis and one of radium cancer in employees of a radium plant. The radium concentration in exhaled air in one case was about 6 times as great as in healthy unexposed workers. Examination of the tissues indicated 3 to 6 microgram deposit in the body, mostly in the spinal column, bone marrow and bony tissue. On the basis of other cases, it is concluded that deposits of 1 microgram may cause fatal poisoning. In order to have that quantity retained, at least 100 micrograms must be inhaled.
- 485 EXPERIMENTS ON THE PROBLEM OF RADIUM POISONING. III. THE COLLECTION OF LATE PRODUCTS OF RADIUM INTRODUCED IN THE ORGANISM. K. Inouye and A. Krebs. *Strahlentherapie* 61, 269-273 (1938). (German).
Experiments on rats show that deposits of late products of radium are found principally in bones, bone marrow, spleen and liver. This fact indicates that delayed injuries from such products may eventually appear in peripheral blood. It is also evident that the tolerance dose for these late products lies below that of the activity corresponding to the Mutscheller tolerance dose.
- 486 A COMPACT NEON-TUBE RADIUM DETECTOR. P.R. Pallister. *Brit. J. Radiol.* 10, 759-763 (Oct. 1937).
A compact neon-tube detector, intended solely for radium detection, is described. The source of potential is a 1.5-volt dry cell operating a transformer in conjunction with an interruptor. All components except the headphones are housed in an electric torch case 9 in. long and 1-1/2 in. in diameter. The presence of a 1 mg. radium needle is readily recorded at a distance of 1 meter.
- 487 VALUE OF RETICULOCYTE DETERMINATION IN THE EXAMINATION OF PERSONNEL EXPOSED TO X-RAYS. III. K. Mardersteig. *Strahlentherapie*, 61, 279-299 (1938). (German).
Chronic inflammation of the palate and chronic catarrh of the throat were found in a number of employees in an X-ray tube factory, and blood changes were found in some. Ozone and nitrous gases were present in the workroom, and the author attributes the blood changes to the ozone and the throat troubles to the nitrous gases. Improvement in ventilation ameliorated the blood conditions. If the damage was caused to any great extent by the radiation, which the author thinks improbable, that condition was also improved by the increased ventilation. Examinations of personnel of a clinical X-ray institute revealed lymphocytosis and rather marked changes. In this case, the author believes radiation to be primarily responsible.
- 488 INTERNATIONAL STANDARDS FOR PROTECTION AGAINST ROENTGEN AND RADIUM RAYS. *Strahlentherapie* 61, 394-400 (1938). (German).
The new standards for all forms of protection are given in detail.
- 489 DIAGNOSIS OF INDUSTRIAL SKIN DISEASES. Louis Schwartz. *Am. J. Pub. Health* 28, 593-600 (May 1938).
It is important to determine whether a dermatitis from which a worker is suffering is of industrial origin- (1) because it has a direct bearing on the treatment of the case and the prevention of its recurrence; (2) because of the compensation involved; and (3) in order to determine who pays the physician's fee. There is no one factor upon which a diagnosis of industrial dermatitis can be made, but several clues are given in some detail, all of which will aid in arriving at a clear diagnosis. They are: (1) history, including earlier attacks before or during present occupation; (2) site of the eruption and its relation to

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industrial exposure; and (3) characteristic appearance of lesions. In most cases definite forms of dermatitis are associated with definite substances handled or present in the working atmosphere. The differentiation of occupational forms of dermatitis from various other types is discussed, as are also the applicability and limitations of patch tests. Fungus infections present a particular difficulty because they are very common. Patch tests for fungus infections are of value only when they are negative. Both fungus infections and chronic eczemas apparently presensitize to dermatitis from other sources and thus offer another difficulty. It is emphasized that no diagnosis should be made without taking all factors into account.

- 490 PREVENTION OF INDUSTRIAL DERMATITIS. W.E. Obetz. O.I.C. Monitor (March 1938). Ind. Med. 7, 230 (April 1938).
This is a brief general discussion of dermatitis, with special reference to the Ohio occupational disease law, which provides compensation for disability and for medical services where there is no disability. About 65% of all claims for occupational disease come under the classification of dermatitis, and they come from a wide variety of industries. Cleanliness and protection are emphasized as protective measures.
- 491 HAND INJURIES DUE TO INJECTION OF OIL AT HIGH PRESSURES. Donald E. Dial. J. Am. Med. Assoc. 110, (May 21, 1938).
This is a report of 2 cases of gangrene in fingers resulting from the injection of oil, under high pressure, into the tissues, such as may occur in working with Diesel engines. At such pressure the fine spray may penetrate the skin and cause injury to the subcutaneous tissues. One case required amputation of part of the finger, while the other recovered under treatment.
- 492 ECZEMA AMONG MASONS. Burckhardt. Dermat. Wchnschr. 106, 288-289 (1938).
The author describes eczema caused by cement and lime and discusses its origin. In cement the important factor is the quantity of tricalcium aluminate; in lime, the calcium hydroxide. In 80 to 90% of the cases, injury is not produced without massive contact. Hypersensitivity is rare.
- 493 SKIN LESIONS DUE TO CALCIUM NITRATE. G. Loreto. Med. Lavoro 28, 161-77 (1937). Italian.
The pathological phenomena observed after application of calcium nitrate to the skin (hyperemia, leucocytic infiltration, necrosis) are due to the irritating action of the compound itself and not to that of caustic impurities such as free lime. Ammonium nitrate, which contains no lime, gives rise to the same accidents as the calcium salt. Abundant perspiration or atmospheric humidity increases the time of contact of the calcium nitrate with the skin and consequently favors the production of irritative lesions. The presence of cuts or scratches is not required for the nitrates to exert their deleterious action. As it is difficult to modify the compound of fertilizers, it is advisable to oblige workmen handling these products to wear gloves and (as far as possible) to make them work in dry weather.
- 494 DERMATITIS DUE TO COCOBOLO WOOD. E.W. Abramowitz and W.B. Swarts. Arch. Dermat. Syphil. 37, 441-443 (March 1938).
The authors describe a case of dermatitis from handling cocobolo wood, with illustrations. A patch test was positive and caused a general outbreak of the eruption.

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- 495 EFFECTS OF INDUSTRIAL EXPOSURES UPON THE LIVER. May R. Mayers. Ind. Bull. 17, 166-8 (April 1938). Reprints obtainable from Division of Industrial Hygiene, N.Y. State Dept. of Labor, 80 Centre St., New York City. The liver is the important chemical laboratory of the body. Among its chief functions is its detoxifying action, both on substances produced in the body and those introduced from without. Up to a point, the liver serves fairly well in protecting the body against injury by toxic substances. When such injury, however, begins to interfere with normal function, the secondary accumulation of toxic by-products of normal metabolism is added to the toxemia produced by the substance produced by the original damage, and in spite of the liver's enormous reserve powers, severe injury may finally result, in an apparently short time. Among the substances especially toxic to the liver are chloroform, carbon tetrachloride, chlorinated naphthalenes, phosphorus, cadmium, manganese and possibly arsenic. Other poisons responsible for severe blood destruction also affect the liver indirectly. It is difficult to estimate the effect of these poisons by measurement of the liver function, on account of the diversity of its functions and its great reserve power. In the case of benzene, the increase in urinary organic sulfate elimination has been found a reliable guide to the extent of exposure. It is a question, however, in what way other poisons such as carbon tetrachloride affect the formation of organic sulfates from benzene. Individual susceptibility to all poisons varies greatly. However, on account of the increased sensitivity to one poison when the liver has already nearly reached its limit of tolerance by exposure to another poison or other pathologic condition, several rules for exposure may be established. The following persons should not work with liver poisons: (1) those with a history of jaundice; (2) those who appear hypersensitive as evidenced by characteristic dermatoses; (3) persons who have been treated with other potential poisons, such as arsphenamine, or have had chloroform for anesthesia; and (4) pregnant women. Little is known about prophylaxis against liver poisons, but treatment with calcium and carbohydrates seems to relieve the symptoms and recently discovered substances extracted from the liver or produced synthetically give some promise.
- 496 CARCINOGENESIS EXPERIMENTS BASED ON INTRAPERITONEAL INJECTIONS. I. 3,4-Benzopyrene. II. Cholanthrene. Gann 31, 568-75, 660-4 (1937). Japanese. Biweekly intraperitoneal injections in 0.2 c.c. doses of 0.5% olive oil solution of 3,4-benzopyrene into mice produced widespread peritoneal sarcomatosis in 103 to 157 days. The peculiarity of the peritoneal sarcoma produced was its marked tendency to invade the liver. Weekly injections in 0.1 c.c. amounts of 0.5% solution in olive oil of methylcholanthrene into the peritoneal cavity induced peritoneal sarcomata in 9 out of 17 mice in 77-114 days.
- 497 EXPERIMENTAL PRODUCTION OF BLADDER PAPILLOMA IN WHITE RATS BY FEEDING 4-HYDROXY-2,3-DIMETHYLAZOBENZENE. A CONTRIBUTION TO THE KNOWLEDGE OF PATHOMORPHOLOGIC ORGAN AFFINITY FOR CHEMICAL SUBSTANCE. Naoaki Nagao. Gann 31, 335-40 (1937). Japanese. A few more details are available in Chemical Abstracts, May 20th. The above chemical and one of its derivatives produced papilloma of the bladder on extended feeding, in a few of the animals under investigation.
- 498 OXYGEN POISONING AND TUMOR GROWTH. J.A. Campbell. Brit. J. Exper. Path. 18, 191-197 (1937). The author treated rats bearing several varieties of tumor to oxygen under pressures of 4 to 5 atmospheres but obtained no destruction of tumors, contrary to the results of Ozorio de Almeida. However, the latter investigator's observation that starvation increases the toleration of rats to high oxygen pressures was confirmed. The author also demonstrated that external temperature may exert an effect on oxygen poisoning; a change from 33° C to 24° C usually prevents death which almost always occurs at the higher temperature.

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- 499 COMPENSATION FOR MINERS' NYSTAGMUS. J. Am. Med. Assoc. (London letter) 110, 908 (Mar. 19, 1938).
A British government committee appointed to investigate nystagmus reports that it is caused by inadequate lighting at the coal face, and recommends that the electric cap lamp be more widely used. A case should not be certified unless the oscillations have been present for a definite period. Medical boards should be set up in each coal district to pass on all phases of the subject. As work is an important factor in recovery, each sufferer must be given a job and employers should cooperate in finding work.
- 500 THE EFFECT OF SALT DEFICIENCY IN MAN ON THE VOLUME OF THE EXTRACELLULAR FLUIDS AND ON THE COMPOSITION OF SWEAT, SALIVA, GASTRIC JUICE AND CEREBROSPINAL FLUID. R.A. McCance. J. Physiol. 92, 206-218 (March 1938).
Among the results of experimental sodium chloride deficiency in man were found a decrease in volume of extracellular body fluids amounting to 28 to 38% and a considerable but variable fall in the sodium chloride content of perspiration. The latter result was not produced by adaptation to repeated sweating. In two subjects who subjected themselves to sweating while taking an abundance of salt, there was an increase in loss of sodium chloride, rather than the decrease that would be expected if adaptation were present.
- 501 HOURS AND EFFICIENCY: PROBLEMS OF INDUSTRIAL FATIGUE. H.M. Vernon. Times Trade and Eng. 42, No. 888 P. 9 (Feb. 1938).
The author discusses the working time provisions of the new British Factories Act and 40 hour restrictions in the laws and contemplated laws of other countries in relation to their effect on production and on fatigue. He believes that decrease in working hours from 48 to 44 hours per week will decrease production in mechanical operations but not in handwork occupations, but that a decrease to 40 hours will affect both. Under the British Act persons under 16 are limited to 44 hours with the possibility of extension to 48 hours under certain conditions. The author regrets that the hours are not rigidly limited to 40 hours for such employees, as they are at a critical stage of growth and frequently attend evening classes.
- 502 THE MACHINE AND THE WORKER: A STUDY OF MACHINE-FEEDING PROCESSES. S. Wyatt, J.H. Langdon and F.G.L. Stock. Indust. Health Res. Board Dept. No. 82, H.M. Stationery Office, London, 1938. Original report is probably obtainable through British Library of Information, 270 Madison Ave., New York, N.Y. A fuller abstract appears in J. Ind. Hygiene & Toxicol. June, 1938.
The relation of machine feeding to fatigue is discussed at length. The authors recommend adjusting the speed of each machine to the capacity of the operator, although this would not allow for variations in human capacity. Some machine makers supply cone-pulleys or variable resistances on their machines, making them somewhat adaptable to varying human capacity. The ability to stand monotony, the necessity for rest periods, and reactions to uniformity of machine speeds are discussed. The results of the inquiry provide further evidence of the value of social contacts as an antidote to boredom, but it is likely that many machine operatives will continue to suffer from boredom and strain. Only certain types of individuals can behave as mechanically as the machine, and a number find such conditions almost intolerable. "Perhaps the chief hope of escape lies in the possibility of complete mechanization."

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- 503 INDUSTRIAL USES OF THE GAS MASK. Erich Neitzel. D. ges. Schiess- u- Sprengstoffsw, 33, 51-3 (1938). (German).
Cases of poisoning, or of prevention of poisoning through the use of gas masks, are cited for the following industrial poisons: lead, phosphorus, mercury and arsenic or their compounds, benzene or its homologs, halogenated hydrocarbons of the aliphatic series, and carbon bisulfide.
- 504 DRYING AIR AND COMMERCIAL GASES WITH ACTIVATED ALUMINA. R.B. Derr, Aluminum Research Laboratories, Aluminum Co. of America, New Kensington, Pa. Ind. Eng. Chem. 30, 384-8 (April 1938). Reprints obtainable from author.
Activated alumina is being employed successfully in new drying processes, both in the elimination of operating difficulties and in applications where the objectives are improved yields and quality of products. The degree of dryness obtainable is discussed. A moisture content of 0.0008 mg. per liter is obtainable under the best conditions. The factors of heat developed by absorption, duration of contact between gas and activated alumina, and temperatures during reactivation are discussed. Applications of the process to the drying of gases to promote the efficiency of manufacturing processes are described. Much less progress has been made in comfort air conditioning than in the industrial field on account of the additional problems of elimination of sensible heat, the need of individual treatment of each large installation problem, and the need of additional research in the more difficult field of comfort air conditioning.