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Air Hygiene Foundation of America, Inc.,
4400 Fifth Ave., Pittsburgh, Pa.,
December 10, 1937

REFERENCES TO RECENT LITERATURE ON INDUSTRIAL DISEASES

(A) News Items.

- 589 MICHIGAN SYMPOSIUM. Ind. Med. 6, 562 (Oct., 1937).
An Occupational Disease Symposium under the auspices of the Department of Labor and Industry of the State of Michigan was held at Detroit on Oct. 21 and 22. Several papers were presented and will be abstracted as they appear.
- 590 OCCUPATIONAL DISEASE SYMPOSIUM. Ind. Med. 6, 550-3 (Oct., 1937).
A symposium on industrial diseases was held at Northwestern University on Sept. 27 and 28. Papers on silicosis, allergy, industrial solvents and general industrial health were presented and will be abstracted as they appear.
- 591 A PLAN FOR INSTRUCTION IN INDUSTRIAL HYGIENE. Ind. Med. 6, 566-71 (Oct., 1937).
Rapid developments in industrial hygiene throughout the country have clearly demonstrated that the weakest link in plans for coping with occupational disease, plant sanitation, and occupational disease legislation, is the lack of adequate training of physicians and engineers in those subjects. A plan for instruction has been developed by the Bureau of Industrial Hygiene of the Department of Health of Detroit. Didactic and laboratory work, credits and degrees will be given by the schools sending their students, but field work and associated laboratory practice for a unit of 3 months, or longer if desired, will be provided by the Bureau. The above Bureau, directed by Dr. Carey P. McCord, will furnish details to interested persons or institutions.
- 592 FIGHTING DUST HAZARD BY GENERAL ELECTRIC. Ceram. Age 29, 334 (Nov., 1937).
The General Electric Co. is now engaged in an extensive program for eliminating dust in its porcelain plant. Approximately \$35,000 has been spent on new booths, and some old equipment has been discarded or replaced. The equipment is of the water-wash type and has proved highly successful. Dust counts show very encouraging results and are still being made, with the receptacle directly in the breathing zone of the workmen.
- 593 EXHIBIT AT 1937 STATE FAIR. Ind. Bull. (Sept., 1937).
The New York State Department of Labor sponsored an industrial hygiene exhibit at the State Fair in September, built around the central theme of "a program for the prevention of dust diseases in industry." A large painting entitled "silicosis" was surrounded with cards containing information about the various silica industries and pictures of lungs showing silicosis, fibrosis and tuberculosis. Following were pictures of efficient and practical exhaust systems for use in typical dusty industries. Wax models of hands showing dermatoses of various types were displayed, and dust and gas detectors were also shown. The exhibit is also being shown at schools, conventions and other meetings.

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- 594 MEETING OF INDUSTRIAL PATHOLOGISTS OF THE 94TH CONVENTION OF THE SOCIETY OF GERMAN SCIENTISTS AND PHYSICIANS IN DRESDEN, SEPT. 24, 1936. Arch. f. Gewerbepathol u. Gewerbehyg. 7, 596-706 (1937).

The subject of the meeting was "Industrial injuries of blood and blood-forming organs," and most of the papers dealt with phases of that subject, including injuries caused by various substances used in industry. Other subjects discussed included injuries of animals from remote action of industrial exhaust gases, the possibility of manganese damage in pyrolusite mines, quantitative spectroanalytical determination of metals in cases of poisoning, and a report on a case of fatal radium poisoning. Abstracts of some of these papers may appear later.

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

- 595 REVIEW OF LITERATURE ON EFFECTS OF BREATHING DUST WITH SPECIAL REFERENCE TO SILICOSIS. D. Harrington and Sara J. Davenport, U.S. Bureau of Mines, Bulletin 400. 1937. 305 pp.

This review, originally issued in parts in mimeographed form, in 1935 and 1936, has been printed as a single bulletin. It is a thorough summary of the literature on silicosis and includes 527 references. It is obtainable from the Superintendent of Documents, Washington, D. C., for 25 cents, cash.

- 596 DUST CONTROL THROUGH ORGANIZED RESEARCH. W.G. Hazard. Safety Eng., 74, 11-14 (Nov., 1937) This office has a limited number of reprints for distribution. The author contrasts procedures for dust control in large plants having legal, medical and engineering departments with the need of small plants having only limited facilities. The research plan of an ideal large corporation, taken as a composite of the best parts of programs now being carried out by several large companies, is outlined. The urge for self-examination was begun in the legal department. A "Hygiene committee" was organized. The engineering department spent generous sums on laboratory apparatus, and a thorough dust survey was made. An engineer gave his full time to the installation of dust control equipment where needed. New types of approved respirators were purchased, two for each exposed workmen and provisions were made so that each would always have his own respirator. Time was devoted to "selling" dust control to everyone from the plant manager down to the janitor. All new machinery was properly equipped with dust control devices at the start. Pre-employment and regular physical examinations were instituted. The legal department cooperated with the other organizations in bringing pressure to bear on State legislatures to bring silicosis under workmen's compensation acts. Dust control was made a part of the company's permanent program.

The small company cannot go through this elaborate procedure, but must turn to an agency that will give advice and assistance. Such organizations include the U.S. Public Health Service, the Bureau of Mines, the Harvard School of Public Health, the Saranac Laboratory, insurance companies, several trade organizations, and the Air Hygiene Foundation.

- 597 INDUSTRIAL EXHAUST VENTILATION. FLOW OF FLUIDS. John L. Alden. Heating and Ventilating. 34, 39-45 (Sept., 1937).

This paper is the first of a series dealing with various phases of exhaust ventilation. The laws of flow of conveying fluids are discussed, with special reference to air. The following factors are considered: compressibility, static velocity and impact pressures, static pressure as a measure of resistance, measurement of pressures, relation of velocity pressure to velocity, Bernoulli's theorem, nature of fluid flow, critical velocity, empirical friction formulas

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Reynolds' dimensional analysis, pipe friction in laminar and turbulent states, velocity distributions and flow of mixtures. The most important conclusions are that flow in industrial exhaust systems is always turbulent and that the presence of solids in the air stream can usually be ignored in the design of dust collecting systems.

No reprints are available at present, but the combined papers may be published at the conclusion of the series.

- 598 INDUSTRIAL EXHAUST VENTILATION. TYPICAL EXHAUST HOODS. John L. Alden. *Heating & Ventilating* 34, 49-53 (Nov., 1937). See preceding note about reprints. The second paper in the series was abstracted in our last Bulletin (No. 548). In this third paper, hoods of various types are described and illustrated by diagrams. Every exhaust problem calls for individual treatment, but the hoods described are to serve as examples. They include hoods for woodworking machinery - saws, planers, shapers and sanders. Hoods for shoe machinery, automatic lathes, drills, milling machines, and similar machinery follow the same principles, and the following general directions are given: (1) always fit the hood to the dust trajectory; (2) provide no adjustments unless absolutely necessary, and (3) hoods must be rugged and must be attached solidly to the machine. Top hoods or canopies are similarly discussed, and booths for spray painting are to be considered as top hoods with side walls. Blow-and-exhaust hoods are recommended for use with tanks where the space over the tank is obstructed. Hoods for abrasive processes are not included, as they have been fully treated in the Tentative Code of the American Foundrymen's Association.
- 599 DUST DANGERS EXPOSED. Milton H. Kronenberg. Chief, Division of Industrial Hygiene, Illinois State Dept. of Health, Chicago, Ill. *Modern Hospital* 49 A, (Aug., 1937). Reprints obtainable from author. In a large city hospital rubber gloves were dusted with talc powder in the course of preparation for operations, in a rather small room, by methods which produced a great amount of dust, and no precautions were taken for protection or dust removal. The Illinois Division of Industrial Hygiene in a survey found 39 million particles per cubic foot, of which 55% was under 5 microns. The powder consisted of 82.7% talc, 8.7 calcium carbonate, 6.6% magnesium carbonate, and 1.0% moisture. The conditions were comparable to those found in dusty factories. Talc is one of the substances implicated in the production of pulmonary diseases, which, however, are of the non-disabling type. Measures to control and remove talc dust environment in hospitals are urged, and the same preventive measures that should be taken as in an industrial establishment. "We feel that perhaps many other hospitals in this country are using methods, some more primitive than others, where a potential hazard is created by the inhalation of talc dust which contaminates the working atmosphere. The trend of the day, based upon scientific facts and measures, is to prevent all dusts, as well as fumes, vapors and gases, since all are dangerous."
- 600 NOTES ON AN INSTRUMENT DESIGNED TO RECORD CONTINUOUSLY THE AMOUNT OF DUST IN AIR. C.W. Biscoard Jeppe and E.C. Halliday. *J. Chem. Met. Mining Soc. S. Africa*, 38, 75-80 (Aug., 1937). This instrument, developed at the University of Witwatersrand, measures atmospheric dust while in suspension. The air is drawn through a chamber by convection by a heating unit. The light scattered by the suspended dust falls upon a photo-electric cell, and the current is measured by means of a Wheatstone bridge. The possibility that moisture may increase the light scattering is being remedied by the construction of a waterproofed instrument. The work is being continued.

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- 601 NOTE ON A NEW OCULAR MICROMETER FOR USE IN DUST COUNTING. Richard T. Page. Pub. Health Reports 52, 1315-6 (Sept. 17, 1937). Obtainable from Supt. Of Documents, Washington, D.C., for 5 cents, cash.
A description of a new micrometer eyepiece which has only one ruled grid corresponding in size to one quadrant of the usual Whipple grid. The new eyepiece is used by the Division of Industrial Hygiene of the U.S. Public Health Service, and it is said that the results are identical with those obtained when counting one-fourth of the Whipple field.
- 602 DETERMINATION OF DUST IN FLOWING GASES. E.V. Yushmanov and M. Popil'skii. Zavodskaya Lab. (Russian) 5, 820-4 (1936).
The gas is passed at known velocity through a small dust-trap, which is weighed before and after the experiment.
- 603 FINE-DUST FILTER - THE PROBLEM AND ITS SOLUTION. G. Stampe, K. Grosskopf and K.F. Moellering. Draeger-Hefte (German) No. 191, 3571-82 (1937).
The paper opens with a discussion of the occurrence, characteristics and danger of fine dusts. Coarse dusts, defined as between 1 and 5 microns in diameter, are easily caught by a filter of cotton or other fibers, but dusts under 1 micron require a specially constructed filter. Several methods for particle size determination are described. A filter constructed by the Draeger Co., designated "fine dust filter DF 90" has a pre-filter of loosely pressed fibers and an accordion filter of specially prepared filter paper. It has an efficiency factor of 99.85% when tested against fine stone dust and silica dust. Photomicrographs of dust collected from the air before and after filtration are shown. Photographs of the filter and of apparatus for particle size determination are also given.
- 604 THE SILICOSIS PROBLEM AND THE NECESSITY OF RELIABLE METHODS OF DUST MEASUREMENT. G. Hass. Zentrbl. f. Gewerbehyg. 24, 175-7 (1937). (German.)
A general paper listing the dust problems still to be solved and noting the need for dust determination and analysis. The various instruments for those purposes are mentioned.
- 605 ANIMAL EXPERIMENTS ON PATHOLOGIC TISSUE CHANGES FOLLOWING INTRAVENOUS INJECTION OF VARIOUS DUSTS. K.H. Stoeckel. Arch. f. Hyg. (German) 118, 111-25 (1937).
Various dusts, including steel-shot, quartz, lime, Thomas slag, chamotte, quartzite and argillite, were injected in rabbits at intervals. Tissue changes in different organs are described and illustrated. Different dusts, however, never showed a really characteristic or specific reaction. Lack of information on the composition of some of the dusts and variations in average particle size limit the value of the results.
- 606 DUST AND TUBERCULOSIS. EXPERIMENTAL WORK ON THE EFFECT OF SERICITE AND GRINDING WHEEL DUST ON TUBERCULAR GUINEA PIGS. H. Selter and P. Weiland. Arch. f. Gewerbepath. u. Gewerbehyg. 8, 71-82 (1937). (German.)
The authors compared the effects of sericite and of grinding wheel dust, consisting of steel and emery dust, by exposing animals infected with virulent and weaker tubercle bacilli, to inhalation of the dusts. They found that sericite is as injurious as the grinding dust. (The abstractor points out that no comparison was made with silica dust, and no pneumoconiosis developed, so the experiments have no bearing on the sericite question.)

- 597 ULTRAMICROSCOPIC SILICA IN LUNG TISSUE. O.M. Faber. *Staug*, no. 3, 372-83 (Oct., 19, 1936). German.
The author points out some possible sources of error in determining the presence of silica in portions of hardened lung by x-ray spectroscopy. The formalin used for hardening the lung tissue causes some deflection of the x-rays which must be allowed for. The x-ray spectrum from pieces of lung was present in such exceedingly minute particles (0.1 to 0.01 micron) as to suggest that it was in colloid form. The theory is advanced that silica becomes converted in the body into the colloid form, in which it is most injurious. It is now necessary to know whether silica is actually inhaled in colloid form in any considerable quantity, or whether the colloid silica found in the lung tissue results from the breaking down and dissolving of large particles. Further investigations are to be made on that point.
- 603 EXHAUST VENTILATION FOR DUST CONTROL IN WET ROCK DRILLING. Theodore Hatch, Div. of Industrial Hygiene, N.Y. State Dept. of Labor, 80 Centre St., New York City. *Ind. Bull.* 16, 339-90 (Oct., 1937). Reprints obtainable at above address.
The author reports a series of tests with 3 types of drills equipped with exhaust devices, in hard, wet rock. Three criteria must be applied to test the capacity of exhaust apparatus to operate under wet conditions: (1) the wet sludge must be removed without clogging the exhaust hood or hose; (2) the dust collector must effectively handle the material without becoming plugged, and (3) an overflow must be provided that will allow the collected water to drain away when it exceeds a safe level of operation. The first criterion is simply a matter of adequate transporting velocity in relation to the density and fluidity of the sludge. The equipment tested was entirely satisfactory in that respect, so that there was practically no dust remaining to clog the filter. The average particle size of dust caught on the filter was less than 1 micron, and the moisture on the filter was that expected from condensation alone. The devices were equipped with overflow valves, fulfilling the third requirement. The objection has been made that exhaust apparatus will not collect and remove cuttings from wet rock or function in the presence of water. The tests were limited in scope and duration, and it cannot be concluded that this type of apparatus will function under all conditions; however, the tests have demonstrated its practicability, and the method is therefore recommended.
- 609 NEW DOCUMENTS ON SILICOSIS. E. Martin. *Med. du Travail* 9, 149-56 (July, 1937). INQUIRY REGARDING SILICOSIS IN BELGIUM ORGANIZED BY THE INDUSTRIAL MEDICAL SERVICE. *Ibid.* 157-64. SILICOSIS: NEW RADIOGRAPHS AND CONTENTS. M. Conrozier and J. Magnin. *Ibid.* 165-209.
The entire July issue of *La Medecine du Travail* is devoted to silicosis. Progress in silicosis prevention in France and Belgium has been retarded by the opposition of a small but powerful group of mining companies and their physicians. The first paper tells the story of the long fight in France and the progress that has been made. The second gives a short review of the Belgian investigation and its results. The third presents 23 x-rays and short case histories, on the basis of which they state the view, held by all experts, that silicosis is a separate disease from tuberculosis.
- 610 PHYSICS AND TECHNIQUE OF AIR SEPARATION. H.W. Gonell. *Chem. App.* 24, 193-7 (1937)
The author explains the physical principles of separating particles of different sizes of dust and powdery material by an air current and described the apparatus and its practical application.

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- 611 LAW OF SIZE DISTRIBUTION AND STATISTICAL DESCRIPTION OF PARTICULATE MATERIALS. P.S. Roller. J. Franklin Inst. 223, 609-33 (1937).
This is a mathematical treatment of the results obtained with air separator described in our abstract No. 362. A law of size distribution has been discovered which relates the weight percentage and from this the frequency, to size of particle. The author deals with finely divided clays, litharge, silica, cement, lime, feldspar, talc, and the like as used in the ceramic industry. It seems probable that the method can be applied to hygienic problems.
- 612 IMPROVED METHOD FOR DETERMINING NASAL FILTRATION OF DUST. G. LEHMANN. Arbeitsphysiol. 9, 569-71 (1937). (German.)
Time is saved by the use of a photometric method instead of the konimeter, for counting dust particles. The Zeiss Pulfrich photometer and a special stage are employed. The apparatus must be calibrated for each kind of dust.
- 613 THE SIGNIFICANCE OF NASAL DUST FILTRATION IN ASBESTOSIS. G. Lehmann. Arbeitsphysiol. 9, 572-8 (1937). (German.)
The author determined the nasal filtering efficiency of 73 workers in an asbestos plant. Most of the employees had not worked long, and only 1 medium to severe case of asbestosis was found, with 17 light and 24 incipient cases. He concludes that nasal filtering efficiency is as significant in asbestosis as it is in silicosis.
- 614 PATHOLOGICAL AND ANATOMICAL QUESTIONS IN CASES OF PNEUMOCONIOSIS: SEVERE ASBESTOSIS. W. di Biasi. Med. Welt 11, 1234-7 (1937). (German.)
The author gives a clear discussion of pathological and anatomical changes in the development of pneumoconiosis (silicosis) and emphasizes the fact that no real pneumoconiotic changes have been seen without exposure to quartz. In hundreds of cases in the Ruhr district, he has never seen connective tissue growth in lungs completely blackened by coal dust unless rock dust was also present. Claims to the contrary have not been confirmed by autopsy findings. In asbestosis, the growth of diffuse connective tissue is greater in the lower part of the lung than in the upper. The author attributes this growth to the mechanical action of asbestos.
- 615 DUST CONTENT OF AN ASBESTOSIS LUNG AND THE NATURE OF ASBESTOSIS BODIES. N. Sundius and A. Bygden. Arch.f. Gewerbepathol. u. Gewerbehyg. 8, 26-70 (1937) (German.)
This long paper reports careful chemical experiments on the asbestos in the lung and asbestosis bodies. Although much more serpentine asbestos than hornblende is used in industry, the latter was found exclusively in the lungs examined. The asbestosis body sheaths are formed not only around asbestos but also around similar crystals of other substances. No support has been found for the belief that asbestos causes a chemical decomposition in the lung. The gel substance of the sheath consists of iron oxide, phosphoric acid and a protein. This gel substance originates entirely from the body fluids and since the iron content is high (40% as oxide), the most plausible suggestion is the blood. The cause of the sheath formation is not related to the chemical nature but to the rigid and sharp needle form. The authors believe that the fibrosis can also be attributed to this.

- 616 THE RAILROAD SURGEON'S RELATION TO OCCUPATIONAL DISEASE. Oliver G. Browne, General Claims Agent, New York Central Railroad System, New York. Ind. Med. 6, 544-7 (Oct., 1937). Reprints obtainable from author.
There are 2 conceptions of the term "occupational disease." One includes any disease or ailment that may have its inception in the course of the occupation and may be said to have had a contribution to its cause by some exposure of the employment, however slight. The other view is that a disease to be classed as occupational must be one that is "peculiar to and characteristic of" the occupation. Only under the second viewpoint can we determine what constitutes a disease disability that is fairly chargeable to industry. However, the first view has been advocated in addresses on occupational diseases and in the courts and is the basis of "blanket coverage" in the laws of several states. If this view is accepted, the employer can be saddled with a form of health compensation which he cannot prevent even by an extreme of precaution, and which is far worse in its possibilities than any reasonable scheme of health insurance so far proposed. In the railroad industry, admittedly there are true cases of occupational disease, but several claims are cited in which it was shown on investigation that the injury was not a result of the occupation. Each case must be scientifically determined on the facts developed, so that employment may not be charged with every man's physical breakdown. In the field of silicosis, the work of Dr. McCann on determination of disability, supported by Rochester manufacturers, is cited and conclusions are quoted. Proper diagnosis is difficult, and often conclusions based upon inadequate examination and uncertain history are accepted by the courts. The medical profession has important functions in the field of determination of industrial disease claims, and should lead thought in channels founded on common sense and not follow those whose thinking is more social than scientific.
- 617 THE WIDER ISSUES OF HEALTH LEGISLATION IN INDUSTRY. L.P.Lockhart, R.E.Lane and E.Bevin. Brit. Med. J. 2, 605-12 (Sept. 25, 1937).
Three addresses are devoted to discussion of what may evolve in industrial medicine from the new British Factory Act.
- 618 A STUDY OF CHRONIC CHEST DISEASES IN SHOTTS, SCOTLAND. J.A.Moore Hall. J. Ind. Hyg. 19, 506-9 (Nov., 1937).
Sixty-four miners, suffering from chronic chest diseases, were examined, 59% being totally incapacitated. Dyspnea, cyanosis, clubbing of the fingers and barrel-shaped chests were noticed in many of the cases. Cardiac vascular disease was absent, but evidence of myocardial decompensation was observed. Pneumoconiosis occurred in 42% of the cases, most of which had chronic bronchitis also. Pulmonary tuberculosis, mostly of low grade, occurred in 17%. The blood sedimentation reaction was normal or subnormal, except in the presence of active pulmonary tuberculosis or secondary infection. Unfortunately the test did not help in differentiating between these two conditions. The incidence of pulmonary affections in the families of the incapacitated miners was found to be much greater than in the families of healthy miners. The employment of men who have no familial diathesis to respiratory disease is suggested as a means of minimizing chest affections in the coal mining industry. - From the author's summary.
- 619 INDUSTRIAL HYGIENE - ITS HISTORICAL DEVELOPMENT AND THE MODERN CAMPAIGN. Milton H. Kronenberg, LD., Chief, Division of Industrial Hygiene, Illinois State Dept. of Health, Chicago, Ill. Ill. Med. J., (July, 1937). Reprints obtainable from author.
This is a general paper, first briefly reviewing the history of industrial hygiene, and its necessity which arose with the progress of the machine age.

The author then pleads for fuller recognition of preventive medicine in industry, better training of physicians in industrial hygiene, employment of trained engineers, cooperation of compensation boards, strong and unbiased legislation, and the establishment of industrial hygiene laboratories.

- 620 EMPLOYEE EXAMINATIONS. Hart E. Fisher. Ind. Med. 6, 503-6 (Sept., 1937).
The author advocates pre-employment and periodical or non-periodical medical examinations of employees, not merely in connection with occupational diseases but as a general health measure benefiting both employer and employee. The advantages to both are presented in chart form.
- 621 A MEDICAL CONTROL PLAN FOR THE PREVENTION OF OCCUPATIONAL DISEASE. Robert C. Page. Ind. Med. 6, 491-6 (Sept., 1937).
A medical control plan necessitates an exact understanding among the various parties involved, including the employer, the employee, the examining physicians and the insurance carrier, with respect to the part each plays in the program. A proposed plan is presented in tabular form, including a schedule of departments, operations, exposures and physical examinations, and forms for various physical examinations. The responsibilities of the employer, the examination, the insurance company and its engineering department are discussed.
- 622 ANNUAL REPORT OF THE CHIEF INSPECTOR OF FACTORIES AND WORKSHOPS FOR THE YEAR 1936. H.M. Stationery Office, London, 1937. Obtainable from British Library of Information, 270 Madison Ave., New York, price about 50 cents.
The number of industrial accidents in Great Britain showed an increase in 1936, but the number of persons employed also increased. Statistical analysis has shown that the curve of accident rates is roughly parallel to the employment curve. However, the rate for fatal and presumably other serious accidents shows a tendency to decline. One means of reducing accidents that should receive more attention is the safeguarding of new machinery as soon as it is installed. The accident rate for persons under 18 is higher than for mature workers, but it is declining, and special care of young workers is urged.
In the section on occupational diseases, progress in prevention is noted in many lines. No general adverse effects on health have been attributed to the use of speeding-up systems. Lead poisoning, dermatitis from handling tar and pitch, and cutaneous cancer among cotton mule spinners have shown encouraging decreases. An investigation of cancer of the nose and lung among nickel refiners is being pursued, and although the cause has not been determined, dust and fume suppression is urged as a preventive measure. In sandblasting, several firms who have lately substituted steel grit and shot for sand and flint have now reverted to their former practice, and regulations controlling the use of sand are advocated. The number of voluntarily reported cases of dermatitis is increasing, but suitable means for protection are becoming more widely known. Acne from the use of chlorinated waxes is being studied.
- 623 "PERMINAL W" AND CALCIUM-CHLORIDE TREATMENT OF HAULAGE-ROADS. H. Price. Trans. Instn. Min. Engrs., London, 93, 252-60 (June, 1937).
The paper describes the treatment of haulage roads with the wetting agent "Perminal W." On adequately stone-dusted roads treatment with water alone is satisfactory over a limited period, but has no effect on water deposited afterward; treatment with calcium chloride is satisfactory, lasts longer, and a portion of the dust subsequently deposited is taken up. On roads of this type treatment with calcium chloride alone is as effective as when Perminal is also used.

- 244 DISABLING ILLNESS AMONG THE INDUSTRIAL EMPLOYEES IN 1936 AS COMPARED WITH EARLIER YEARS. D.K.Brundage. U.S.Public Health Repts. 52, 1297-1303 (Sept. 17, 1937). Reprints obtainable from Supt. of Documents, Washington, D.C., for 5 cents, cash. The sickness and nonindustrial injury rate for males in 1936 was 90.3 per 1000, the highest since 1932, and the rate for sickness exclusive of influenza 63.7 per 1000, the highest for 6 years. Tuberculosis of the respiratory tract has decreased from 1.9 in 1921 to 0.8 in 1936. The rates for women are 160% higher than for men.
- 255 AIR CONDITIONING FOR THE VENTILATION OF THE BUTTE MINE. A.S.Richardson, Min. Cong. J. 23, 43-5, 55 (Oct., 1937).
The paper describes the air conditioning system in use at the Butte mine of the Anaconda Copper Co. The process consists in transferring the heat from the air to water in copper pipes, which is then raised to the surface and cooled by the atmosphere. Only in the summer is it necessary to use artificial means of cooling. That is accomplished by a special system involving sprays and cooling coils. The water delivered to the line is then cooled to 50°F. In the experimental plant, the air was often cooled by 20°, and the average mine air is expected to be reduced to 75°F. About 46% of the dust in the air is removed on the average, and greater comfort and efficiency has been attained.
- 266 AIR CONDITIONING OF THE MAGMA MINE. William Koernes and C.B.Foraker. Mining Cong. J. 23, 21-3 (Nov., 1937). REMARKS ON AIR CONDITIONING FOR MINES. J.F. Kooistra. Ibid., 23-5
These papers were contributed to the discussion to the preceding one. The general manager and the ventilating engineer of the Magma Copper Co. describe the recent installation of air conditioning in the Magma mine at Superior, Ariz., where a more severe problem had to be solved. The temperature at the 3,400 foot level is 134°F, and 140° at the lowest level, 4,000 feet. Previously it was necessary to allow about 3 years of cooling by ordinary ventilation in a new low level before stope development could be carried on. A water circulation system is used here also, but cooling of the water by refrigeration is necessary. The refrigerant is monofluor-trichloromethane, a liquid at ordinary temperature, non-toxic and non-combustible. The problems of sufficient water supply, temperature of the underground water and the distance from its source to its place of use and how they were solved, are discussed. All the water produced in the mine is used, and an additional shaft was necessary to bring it to the surface. No data can be given as yet on economics of operation, as the system has been in operation only a few weeks, but the early results are gratifying, and as the rock on the lower levels is cooled, the cooling effect will be available for parts more distant from the plant. The cost of the system to date is \$95,000. The paper by Kooistra, of the Carrier Corporation, presents some general considerations of air conditioning. Its success in mines has been demonstrated in South Africa, and the lowering of temperature already achieved in the Magma mine is sufficient to increase materially the efficiency of workers. A chart shows the temperature and humidity conditions necessary to secure conditions within the "comfort zone."
- 627 HYGIENIC AIR NEEDS IN THE VENTILATION OF WORK PLACES. W. Lisse. Gesundh. Ing. 60, no. 24, 374-80 (1937). (German.)
The entire number of periodical is devoted to stressing the significance of good air in work places, the subject of a drive undertaken by the German "Work Front." The paper mentioned serves as introduction to the series. The author defines good air as that free from dust, odor and toxic materials and absorbing the excess heat of the human body. He lists the basic principles set down by American industrial hygienists. Papers follow dealing with various measurements and standards relating to air conditioning.

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- 628 PHYSICAL AND PHYSIOLOGICAL PRINCIPLES OF AIR CONDITIONING. II C.P. Yaglou. J.A.M. 109, 945-50 (Sept., 18, 1937).

The general objectives of air conditioning for summer and winter are outlined. New experiments on summer cooling show that the shock from overcooling experienced by sensitive persons can be avoided and at the same time all occupants can be comfortable. Additional experiments on drafts and their effects are mentioned.

- 629 VENTILATION NOMOGRAMS. R. McAdam. Colliery Guardian 154, 735-6 (April 16, 1937). J. Chem. Met. Min. Soc. So. Africa, 38, 50-2 (July, 1937).

Four nomographs are presented, furnishing a ready means of automatically solving several common ventilating formulae, including the 6 most involved formulae used in the "Standard Specifications for the Testing of Mine Fans" adopted by all mining engineers in England.

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

- 630 THE GREAT PROBLEMS OF MODERN INDUSTRIAL TOXICOLOGY. F. Flury. Arbeitsschutz, 199-200 (1937). (German.)

A brief discussion of the chief problems in toxicology is presented. New chemicals are offered daily whose names give no hint of their contents; declaration of contents should be compulsory. There are also complicated injuries, not only from the combined action of different toxic agents, but also from the combination of poisons and alcoholic drinks. Other difficulties lie in the increasing chemical treatment of foods and the misuse of medicines. The study of these problems must include refinement of methods, ascertainment of norms, and discovery of the effect of poisons on the young, and of the relation between poisoning and inheritance. Purification of air must be sought not only for workplaces but also in the streets.

- 631 PREVENTION AND TREATMENT OF DISEASES IN THE PETROLEUM INDUSTRY. V. Defelice. Semana Med. (Spanish) 44, 1689-91 (1937).

The most common occupational diseases in the petroleum industry are skin disorders; and there are cases of gastric symptoms and blood conditions associated with hemolysis. Prevention comprises regular medical inspection of the workers, careful personal hygiene, use of protective gloves, and application of glycerin.

- 632 CLINICAL ASPECTS OF LEAD POISONING. Thomas A. Johnson. Penna Med. J. 40 741-4 (1937).

Studies in a lead coating plant led to the detection of 94 cases of lead poisoning in 755 employees, of whom 282 were exposed constantly and 273 intermittently to lead fumes. The blood studies led to the conclusion that a safe critical level is 4% of reticulocytes or 0.2% of stippled cells, or both.

- 633 COMPARISON OF PUNCTATE BASOPHILIA AND RATIO OF LARGE TO SMALL LYMPHOCYTES IN THE DIAGNOSIS AND PREVENTION OF LEAD POISONING. D.O. Shiels. Med. J. Australia, 1, 535-45 (Apr. 10, 1937).

The author has made a thorough study of laboratory procedure in the diagnosis of lead poisoning. The stippled cell count often used is shown to give false impressions of the clinical condition, and may even rise as the patient improves. The ratio of large to small lymphocytes is more closely correlated with the clinical condition than is stippling. Correlation of a vast amount of data shows that it is inadvisable to adjudge the severity of cases by laboratory standards alone. Evidence of lead poisoning with disability is to be expected when the laboratory data show: (a) total stippled count 25,000; (b) coarsely stippled cell count 1,000; (c) ratio of large to small lymphoid cells, less than 1.5; (d) concentration of lead in urine, 0.15 mg. per liter and over; (e) coarsely stippled cell count divided by the ratio of large to small lymphocytes, 800.

PATHOLOGY AND THERAPY OF LEAD ANEMIA. R. Klima and H. Seyfried. *Folia hematol.* (German) 57, 283-95 (1937).

Lead anemia in chronically poisoned guinea pigs and rabbits was studied by examining the blood and investigating the bone marrow by biopsy, and in a few cases by sternal puncture. Erythropoiesis is greatly increased, and a lively action of the bone marrow is observed in a few days. The erythropoiesis remains high for a few weeks and then falls gradually at which point exhaustion begins. Finally red marrow is converted into a kind of gelatinous or fatty marrow. Temporarily stippled cells are present, but not in all cases. Probably the lead in the blood stream acts on the erythrocytes so that they are decomposed in the spleen and other organs that remove old or damaged cells. The marrow responds to the first hemolysis with increased erythropoiesis. There is a basic difference between the results of lead poisoning and pernicious anemia, although there are many similarities. Liver treatment in chronic lead poisoning does no good, although it may be of some value in acute cases.

635 SPINAL INJURIES FROM LEAD AND THE SIGNIFICANCE OF SPINAL FLUID LEAD DETERMINATION IN RECOGNIZING LEAD DAMAGE OF THE CENTRAL NERVOUS SYSTEM. F. Duensing. *Deutsch Ztschr. f. Nervenheilk.* 143, 297-305 (1937).

A case of lead poisoning resulting from lead in drinking water, and resembling tubes is described. The lead in the spinal fluid was 220 micrograms per 100 cc. but only 72.2 in the blood, indicating spinal lead injury. In another case, that of a painter, the amount in the spinal fluid was 493 micrograms per 100 cc. Other cases in the literature are mentioned, and all point to the necessity of determining lead in the spinal fluid.

636 SULFUR THERAPY OF CHRONIC LEAD POISONING AND URINARY LEAD ELIMINATION. G. Sabatini, P. Molino and M. Mazzantini. *Med. del Lav.* (Italian) 28, 129-38 (1937).

The authors claim as a result of an investigation that intramuscular injection of various sulfur preparations in cases of chronic lead poisoning is followed by a decrease in urinary lead and diuresis and that the patients show a rapid improvement in general condition and a progressive diminution in clinical symptoms.

637 LEAD MOBILIZATION AND MINERAL METABOLISM IN LEAD POISONED PERSONS. F. Schmitt and H. Taeger. *Ztschr. f. exp. Med.* 10, 21-41 (1937) (German).

The authors studied variations in daily lead elimination and lead in blood in two lead poisoned persons, in order to determine fixation or mobilization of lead during various methods of treatment. In agreement with other workers, they found increased lead elimination or mobilization following acid diet with ammonium chloride, calcium poor diet, or the use of sodium carbonate, potassium iodide, elytran or parathormone. In disagreement with others, they obtained the same results with an alkaline vegetable diet and by oral or intravenous administration of calcium, and conclude that the effect is caused by a sudden diet change or sudden administration of large calcium doses. They recommend the use of gradually increasing doses of calcium, phosphate and gluconate. (This conclusion is questioned by the abstractor on the ground that a larger number of cases should be studied.)

638 WHAT LEAD CONTENT IN CHEMICAL BLOOD EXAMINATIONS SHOULD BE CONSIDERED AS PATHOLOGIC? W. Ehrhardt. *Ztschr. f. aertyl. Fortbild.* (German) 34, 436 (1937).

Lead contents of 0.005 to 0.01 mg. per 100 cc. of blood are found in normal persons, while in lead poisoning they are 0.07 to 1 mg. The evaluation of blood lead must be considered in relation to other findings.

- 639 OBSERVATIONS AND EXPERIMENTS ON MERCURY POISONING IN THE LABORATORY. E. Hohwi Christensen, M. Krogh and M. Nielsen. Skand. Arch. f. Physiol. 76, 273-8 (1937). (German). Also brief account in Nature 139, 626-7 (1937).
In the course of experiments on the effect of increased carbon dioxide content of inspired air, the subjects in one test experienced more serious symptoms than usual. The trouble was traced to droplets of mercury which had fallen from a receptacle to the table and floor. The conditions of the experiment contributed to the maximum effect of the small amount of mercury. Similar effects were found in animal experiments. This occurrence calls attention to the care needed in breathing experiments.
- 640 ACUTE MERCURIAL POISONING. Jarrett E. Williams and C.F.N. Schram. Ind. Med. 6 490-1 (Sept., 1937).
A few workmen were engaged for several days in removing mercury seals from stills. In the course of several years, small quantities of mercury had been spilled from time to time upon the lids of the stills and some of it had been painted over. Holes were cut through the lids by means of an acetylene torch, and although the visible mercury had been removed, and only the odor of paint fumes could be detected, several men developed cases of acute mercury poisoning. Apparently all the trouble arose during the first day's work, when the ventilation was insufficient. Symptoms are described. All the patients recovered, but the occurrence is reported to show the necessity of extreme care in situations in which mercury vapor may be present.
- 641 ZINC FEVER. PROPHYLACTIC RESULTS. H.S. Natvig. Fidskr. f. d. Norske Lægeforening (Norwegian) 57, 456-65 (1937).
Cases of zinc fever, often recurrent, were observed in over 100 workers in brass foundries and other workshops where zinc is fused with copper. The disease is transitory and comparatively harmless but disagreeable. It is caused by the inhalation of very fine particles of zinc oxide formed from the zinc vapor which is given off in large quantities when molten zinc and copper are mixed. The particles are sufficiently small to enter the alveoli. No fixed ventilation system or respirator was found adequate. A movable device was contrived, equipped with a funnel-shaped opening and forced draft for removing the zinc vapor at its point of generation. No case of zinc fever has been found where it was in use.
- 642 CHRONIC ARSENIC POISONING AN OCCUPATIONAL DISEASE, NOT AN OCCUPATIONAL ACCIDENT. J.A.M.A. (medicolegal abstracts) 109, 388 (July 31, 1937).
The Oregon state supreme court ruled that a case of arsenic poisoning of the hand from peeling sprayed fruits was an occupational disease, which is not compensable, and not an accident.
- 643 EXPERIMENTAL INVESTIGATION ON THE EFFECT OF ARSENIC ON THE LYMPHATIC SYSTEM. D. Bertschinger. Folia hematol. 57, 194-205 (1937) (German).
A daily dose of 1 cc. of 1% solution of arsenic acid, given a rabbit for 38 days, produced a fall in leucocytes after each dose, rising to almost normal before the next injection. A slow steady decrease was also noted. With greater doses a rapid lymphopenia set in. Another experiment indicated that the cause is not injury to lymph tissue but rather destruction of lymphocytes outside the lymphatic tissue.

- 644 CHRONIC ARSINE POISONING. M. Kiese. Arch. f. exp. Pathol. u. Pharmacol. 186, 337-76 (1937) (German).
Animals were subjected one hour daily, over a period of several weeks to quantities of arsine of 4 to 50 micrograms of arsine per liter of air. Twice the maximum quantity produced subacute poisoning in a week. As in acute poisoning, the blood was most affected, especially in fall of erythrocyte count and hemoglobin. Active regeneration was seen at first, but it disappeared later and a stationary state of anemia was reached. When exposure ceased, blood recovery took place more slowly than that of the general condition. In autopsies, much iron pigment and the largest quantities of arsenic were found in the spleen, liver and bone marrow. At about 20-25 micrograms per liter is a range below which the accumulation of poison and injury does not reach its maximum. A real habituation seems to develop.
- 645 USE OF PROTECTOR LIQUIDS IN CHROMIUM PLATING. P. I. Verkhovskaia. Gigiena truda no. 2, 33-6 (1937) (Russian).
A layer of kerosene 10 mm thick over the plating solution was found adequate to prevent escape of vapors, and to prevent abnormal changes in the mucous membrane of the nose and at the base of the larynx, which occurred before the protector liquid was used.
- 646 PROTECTOR LIQUID IN ELECTROLYTIC CHROMIUM PLATING. E. I. Shavardova. Gigiena truda, no. 1, 89-91 (1937). (Russian).
The plating solution was covered by a layer, 20 mm. thick, of petroleum, to which had been added 125 cc. of sulfuric acid, 10 g. of bichromate and 250 cc. of water per liter of petroleum. Practically no vapor escaped from the vats and the process was not disturbed.
- 647 NEW DATA ON THE TOXICOLOGICAL ANALYSIS OF AIR. E. Kohn-Abrest. Rev. chim. ind. (French) 46, 2-14, 40-45, 66-70 (1937).
A general paper describing the determination of carbon monoxide, carbon dioxide, carbonaceous gases, alkyl halogens, hydrogen sulfide, arsine, phosphine, hydrogen cyanide, nitrogen oxides, benzene and solid and finely divided liquid particles.
- 648 THE DETERMINATION OF ATMOSPHERIC CONTAMINANTS. I. ORGANIC HALOGEN COMPOUNDS. Hervey B. Elkins, Amos K. Hobby and James E. Fuller, Division of Occupational Hygiene, Massachusetts Department of Labor and Industries, Boston, Mass. J. Ind. Hyg. 19, 474-85 (Nov., 1937) Reprints obtainable from senior author.
The paper describes a chemical method for the determination of organic halogen vapors and dusts in the atmosphere. The vapors of volatile liquids are absorbed in a suitable solvent in a special absorber, and the solvent is burned in a modified sulfur lamp apparatus. The products of combustion are absorbed in dilute sodium hydroxide solution and the halogen present is determined, after neutralization, by a Mohr titration. Trial and consideration of the properties of solvents led to the selection of amyl acetate as the most suitable. The absorber consisted of 5 inclined tubes in one piece. The method was shown to be satisfactory for 8 chlorine compounds of industrial importance. It is shown theoretically that the volume of air that can be sampled successfully is inversely proportional to the vapor pressure of the substance absorbed. The method cannot be used for extremely volatile substances such as methyl chloride, and cooling with ice is desirable for chloroform and ethyl bromide, also for low concentrations of carbon tetrachloride. Comparison with the activated charcoal method showed that the absorption method is somewhat more accurate for low concentrations. A few comparisons were also made against the direct combustion method, and the relative advantages of the two methods are discussed. To some extent high-boiling and low-boiling compounds in mixtures can be determined separately by the absorption method.

- 549 NOTE ON THE STUDY OF DECOMPOSITION BY HEAT OF HYDROCARBONS, ESPECIALLY CHLORINATED HYDROCARBONS, MIXED WITH AIR. E. Kohn-Abrest and Mafi. Ann. d'Hyg., pub. 15 373-84 (1937) (French.)

The authors describe a process by which quantities of chloroform, trichlorethylene, carbon tetrachloride and tetrachlorethane, far below the danger limit, can be detected. In combustion, free chlorine and carbon dioxide develop only if more than 4 to 12 mg. per liter of the chlorinated hydrocarbons are present, depending upon the substance. In concentrations up to 100 mg. per l., the production of phosgene cannot be detected. Detection of these substances in organs is also described.

- 550 CAUSATIVE INFLUENCES AND CLINICAL TYPES OF POISONING BY CARBON TETRACHLORIDE. THE MEDICO-LEGAL VIEWPOINT. Dervillee. J. Med. de Bordeaux 114, 557-82 (1937) (French.)

The properties and uses of carbon tetrachloride are first described. The results of poisoning are variable, as individual susceptibilities vary greatly. It may affect the brain, the liver and kidneys, the kidneys alone, the lungs or the skin. Details are given of cases falling under these headings. The after-effects of exposure are as variable as the symptoms; some persons are attacked fatally and succumb to uremia or acute pulmonary edema, others recover completely, and others present various sequelae. Treatment must depend upon the manifestations. Prevention is important and easy to ensure. Adequate ventilation and avoidance of close areas and high temperatures are the principal precautions. Its use in therapeutics and in hair lotions should be avoided entirely. Workers injured by its industrial use should receive compensation.

- 551 ARTERIAL AND VENOUS LIPEMIA IN EXPERIMENTAL CARBON TETRACHLORIDE POISONING. G.G. Zolezza. Med. del Lav. 28, 138-47 (1937) (Italian.)

The action of carbon tetrachloride in producing arterial and venous lipemia was traced by animal experiments to the lipoid and fat solvent action on the tissue substance.

- 552 A CASE OF PHOSGENE POISONING DUE TO INHALATION PRODUCTS OF TRICHLORETHYLENE.

Wm. D. McNally. Ind. Med. 6, 539-44 (Oct., 1937).

The paper is devoted mainly to the toxicity of trichlorethylene itself. It is quite stable at ordinary temperatures and the commercial product does not decompose to yield hydrochloric acid, because a small quantity of alkali is added as a stabilizer. However, when it comes in contact with heated metal, gas flames or burning tobacco, it decomposes with formation of hydrochloric acid and phosgene, which is best known from its use as a war gas. Trichlorethylene is used in many industries as an oil and grease solvent, and most of the cases of poisoning result from the inhalation of the vapor. It is somewhat less toxic than most of the other chlorinated hydrocarbons, and does not cause fatty degeneration as do many of the others. However, acute poisoning cases result in anesthesia of the nerve distributed over the face and mouth and atrophy of the optic nerve, leading to loss of sight. The work of a number of experimenters on animals and reports of human cases are reviewed, showing lung damage, blindness, and poisoning of a number of organs. Diagnosis is complicated by the identity of many of the symptoms with those from other causes, which must be considered by careful examination and knowledge of case history. Preventive measures include removal of the vapors by down-draft ventilation, use of a closed system if possible, avoiding contact with flames and heating surfaces and prohibition of smoking.

- 553 NERVE INJURIES (NEURITIS ISCHIATICA, TRAUMATIC EPILEPSY) AFTER ACUTE BENZINE POISONING. H.H. Jansen. Deutsch. Ztschr. f. Nervenheilk. 144, 68-80 (1937) (German.)

The author reports 3 cases in which nerve injury appeared after severe acute benzene poisoning, with description of symptoms. The injuries cannot be definitely attributed to the benzene alone, as the exact composition of the gases was unknown.

- 654 A STUDY OF BENZOL POISONING. Carlos E. Fallon. Ind. Med. 6, 560-2 (Oct., 1937). The symptoms and progress of 3 fatal cases of benzol poisoning in a leather factory under the author's observation are given detail, as are also the results of blood counts on a number of employees. The method of urine sulfate determination and the decrease in the number of white blood cells are good indications of early stages of poisoning.
- 655 ACUTE POISONING WITH A NEW MOTOR FUEL (LIQUID PROPANE GAS). CLINICAL INVESTIGATIONS AND ANIMAL EXPERIMENTS. H.J.Wolf and F.Menne. Arch. f. exp. Pathol. u. Pharmacol. (German) 186, 78-88 (1937). This gas contains mainly propane, with some butane and olefine. A driver who had inhaled some of the gas developed symptoms which can be divided into 2 groups: narcosis and a symptom complex caused by very marked irritation of the parasympathetic system. The authors produced the same symptoms in rabbits, and after severing the vagus and depressor nerves, the blood pressure, which had decreased markedly, recovered. However, a second sample of the gas did not produce the same effects. The authors assume that this vagus irritant is to be found in the olefines, whereas the other symptoms are caused by the propane. Doubtless the olefine content of the gas varies widely.
- 656 THE DETERMINATION OF CARBON DISULFIDE IN BLOOD. J. Roberts Harrower and Frank H. Wiley, Haskell Lab. of Industrial Toxicology, Wilmington, Del. J. Ind. Hyg., 19, 486-90 (Nov., 1937). Reprints probably obtainable at that address. A micro-apparatus is described which permits the determination of carbon disulfide in minute amounts through its conversion to the potassium ethyl xanthate by the action of alcoholic potassium hydroxide and the subsequent oxidation of the xanthate to dixanthate by titration with iodine. Carbon disulfide has been estimated with a fair degree of accuracy by this procedure in a 10 cc. sample of blood containing as little as 0.05 mg. of this substance per 100 cc. - From the author's summary.
- 657 THE SYMPTOMATOLOGY OF CHRONIC POISONING WITH OXIDES OF NITROGEN. N.A.Vigdortschik and others. J. Ind. Hyg., 19, 469-73 (Nov., 1937). No reprints. An investigation was made of the effect of continued exposure to oxides of nitrogen in low concentrations on 127 workers in sulfuric acid plants and etchers in printing shops. The nitrogen dioxide concentration was in almost all cases below 0.005 mg. per liter (about 1.5 parts per million) - a figure that is generally considered safe - and periods of exposure varied from 3 to 5 years. A large number of tests was made, and the findings were compared with those in a control group of unexposed persons of the same ages and living under approximately similar conditions. The results were compared according to approved statistical methods and are presented in a table under the headings of authentic symptoms and probable symptoms according to the degree of correlation obtained. The authentic symptoms include wearing down of teeth, inflamed mucosa of the gums, emphysema of the lungs, tuberculosis, hypotonia, bradycardia, and in the blood, high hemoglobin content, large numbers of erythrocytes, increased vital granulation, marked basophilic granulation, increase in maximum resistance of erythrocytes, accelerated agglutination of blood, reduced catalase index, reduced reserve alkalinity, decreased sugar content, and lability of the sugar curve. The probable symptoms include carious decay of teeth, disturbed gastric secretion, chronic bronchitis, cardiovascular neurosis, and in the blood, moderate leucopenia, moderate lymphocytosis, increase in minimum resistance of erythrocytes, delayed reaction to their precipitation and increased content of bilirubin. The relation of these symptoms to the poisoning is discussed; some follow indirectly as the result of other symptoms. The results were checked by a study of 5 men who had left the hazardous occupations; in all cases a definite tendency of the blood to return to its normal composition was observed. The necessity of further work is emphasized.

- 658 SYMPTOMATOLOGY AND PATHOGENESIS OF SOME POISONINGS. O. Roth. Schweizer. med. Wchnschr. 67, 593-6 (1937). (German.)
The author reports cases of poisoning in which there were some peculiar reactions. In one apparently light nitrous gas poisoning the patient developed an attack of cramps which returned repeatedly in the following years. The cramps were found to follow hyperventilation or dyspnea, and the nitrous poisoning seemed to have cleared the way for this reflex. Another case was that of asthmatic outbreaks caused by welding, and in another bromethyl possibly contributed to development of polyvalent bronchial asthma.
- 659 CLINICAL ASPECTS OF NITROUS GAS POISONING. G. Holland. Med. Klin. (German) 33, 930-2 (1937).
The author reports a case of moderately severe poisoning. In 15 hours after exposure, an x-ray showed both lung fields covered with countless mottled shadows of various sizes which were confluent in the basal region. In 8 days the shadows had disappeared, as did also the pains. Eight months later there was an increase in erythrocytes and in the hemoglobin. Similar changes have been found in other cases.
- 660 NOTE ON THE DECREE OF THE REICH'S MINISTER OF LABOR ON THE GENERATION OF NITROUS OXIDE IN AUTOGENOUS WELDING. P. Kissinger. Aertzl. Sachverstaend. - Ztg. 43, 122 (1937). (German).
A case of lung edema in autogenous welding presented great difficulty to the authorities, and was finally decided as being a fatal accident from "phosphorous and hydrogen sulfide and irreparable gases."
- 661 TOXICITY OF VARNISH FOR BEER BARRELS. J.A.M.A. 109, 454 (Aug. 7, 1937).
In reply to a letter reporting a case of poisoning of a workman varnishing beer barrels and inquiring whether the use of pure grain alcohol instead of denatured alcohol as a solvent would have prevented poisoning, the editor replies that a number of constituents of typical varnishes are toxic, as are also the blow torch fumes, and that the injury probably arose from those sources rather than from any constituent of the alcohol. He advocates the use of a positive pressure helmet for work in enclosed spaces.
- 662 EXPERIMENTAL STUDIES ON INTOXICATION WITH ACETONE. U. Bassi and G. Ghezzi. Med. lavoro (Italian) 27, 225-49 (1936).
Rabbits were intoxicated progressively by acetone. Loss in weight took place, in some cases to one-third the original weight. Some subjects showed habituation, especially with smaller doses. Symptoms included irritation, disturbances of the central nervous system, decrease in the red cell and hemoglobin content of the blood, hyperglucemia and increase in the urobilin in the urine.
- 663 PROTECTION AGAINST MINE GASES. J.J. Forbes and G.W. Grove. Miners' Circular No. 35 U.S. Bureau of Mines, 1937. 52 pp. For sale by the Superintendent of Documents, Washington, D.C., for 10 cents, cash.
This publication is an up-to-date revision of Part III of a series of circulars on advanced mine rescue training, originally published in 1929. The general precautions against fire and explosion dangers include adequate ventilation and the use only permissible explosives, but this circular is concerned mainly with means of protection when a fire or an explosion has occurred. They include: (1) erection of barricades; (2) the carbon monoxide self-rescue respirator; (3) gas masks for protection against gases, smokes and vapors; (4) self-contained oxygen breathing apparatus, and (5) hose masks. The discussion of barricades includes recommendations for their construction, quantity of air necessary to sustain life, and appraisal of their value, illustrated by a table of mine accidents in which they were used. Many types of the various protective devices are described

in detail. A chapter on treatment for gas poisoning or asphyxiation concludes the paper. The recommended forms of treatment include several manual methods of artificial respiration and oxygen breathing apparatus. Mechanical devices such as the pulmotor are not recommended for use by laymen.

- 664 LOSS OF MEMORY FROM GAS POISONING: A MAN WITHOUT TIME MEMORY. G. Stoerring. Ztschr. f. d. ges. Neurol. u. Psychiat. 158, 420-1 (1937) (German.)
A sound film illustrates a case of loss of memory caused by severe gas poisoning at an oven. The man was able to remember experiences for about one second.
- 665 CHRONIC AUTOMOBILE EXHAUST GAS POISONING. INVESTIGATIONS WITH A DIESEL MOTOR. M. Schmidtman. Arch. f. Gewerbepathol. u. Gewerbehyg. 8, 1-13 (1937) (German).
Experiments on rabbits showed that anthracosis results from inhalation of exhaust gases from Diesel motors. Two remarkable observations are that lymph infiltration and increase of connective tissue are found and that the anthracosis is caused by much smaller quantities of soot than those ordinarily required. The author explains both by the small quantities of unburned oil with which the soot is mixed. A Diesel motor generally uses the part of petroleum or the heavy oil of coal or pyrolusite tar boiling at around 300°C.
- 666 BLOOD PRESSURE RESPONSES TO ACUTE CARBON MONOXIDE POISONING. W. R. Brewer. Am. J. Physiol. 120, 91-9 (Sept. 1, 1937).
Animals given mixtures of carbon monoxide and oxygen do not respond by a rise in blood pressure, which is an invariable result of nitrogen administration. This absence of rise is not due to any lack of capacity of the carotid sinus and aortic depressor nerve endings to receive stimuli.
- 667 CHROMOSOMON STUDIES. I. ACTION OF METHYLENE BLUE-GLUCOSE (CHROMOSOMON) ON CARBON MONOXIDE POISONING IN ANIMAL RESEARCH. A. Strum and H. Wohlfahrt. Arch. f. exp. Pathol. u. Pharmacol. (German) 186, 294-302 (1937). II. ACTION OF METHYLENE BLUE-GLUCOSE (CHROMOSOMON) ON ANIMALS POISONED EXPERIMENTALLY WITH CYANIDE. A. Strum and K. Fanser. Ibid. 303-5. III. CAN METHYLENE BLUE (CHROMOSOMON) FORM METHEMOGLOBIN IN THE LIVING ORGANISM. A. Strum and W. Franke. Ibid., 306-12.
The results of three series of experiments reported indicate that chromosomon is a specific antidote against cyanide poisoning and non-specific although effective in carbon monoxide poisoning. It causes no noteworthy increase in methemoglobin and tissue respiration is definitely not endangered by its use.
- 668 FIRST INTERNATIONAL SESSION ON THE PATHOLOGY AND ORGANIZATION OF WORK, PARIS. JUNE 2-6, 1937. Ann. d' Hyg. pub. (French) 15, 413-24 (1937); also in J.A.M.A. (Paris Letter) 109, 722-3 (Aug. 28, 1937).
A short report on this session includes brief notes on a few papers, one by Kohn-Abrest, who showed that paradoxically the carbon monoxide in acute poisoning is washed out of the blood in a few hours, whereas in chronic poisoning traces are detectable for months.
- 669 DISCUSSION OF THE EFFECTS OF ASPHYXIATING GASES ON THE RESPIRATORY SYSTEM. S. Blackmore and others. Proc. Roy. Soc. Med. 30, 1033-8 (July, 1937).
This is a general discussion of the effects of war gases - phosgene, chlorine and mustard gas - and includes etiology, pathology and treatment. In anoxemia oxygen should be administered as soon as possible and maintained until the patient can do without it for 5 minutes without clinical retrogression. Bleeding is an accessory treatment of great value. There is much difference of opinion on the value of infusion of saline, glucose, etc.

- 60 FIXATION OF SULFUR FROM SMELTER SMOKE. R.S. Dean. U.S. Bur. Mines, Rept. Investigations no. 3339 (May, 1937). Obtainable from Division of Information, U.S. Bureau of Mines, Washington, D.C.

The problem of prevention of damage to plant and animal life by sulfur dioxide in the vicinity of smelters has been met in 2 ways: (1) dilution of effluent gases by using high stacks and high gas temperatures, and (2) by converting the sulfur dioxide to a disposable liquid or solid compound. The first method seems likely to remain the most generally applicable and satisfactory for many years. The second awaits development of an economically practical method of recovering elementary sulfur. The present report includes a study of the progress made in this direction here and abroad, and includes progress reports on laboratory studies at the Bureau of Mines on the following processes: (1) absorption of sulfur dioxide by ammonium sulfite solution; (2) addition of ammonia and water vapor to smelter gases to precipitate ammonium sulfite particles and (3) absorption of sulfur dioxide by aqueous diethylene triamine solutions.

- 671 INVESTIGATION OF ATMOSPHERIC POLLUTION, REPORT ON OBSERVATIONS IN THE YEAR ENDED MARCH 31, 1936. Dept. Scientific and Industrial Research, H.M. Stationery Office, London, 1937. Price 6 s. Obtainable from British Library of Information, 270 Madison Ave., New York.

A review of observations in Great Britain for the past 20 years indicates that the smoke abatement movement has had a real effect in reducing smoke pollution. A simpler and less expensive photometer has been devised for measurement of daylight. Earlier experiments to obtain records of sulfur dioxide pollution from different wind directions have led to the development of an apparatus which records the frequency of winds from each of eight sectors and exposes a corresponding sector of a lead peroxide fabric. In subsequent analysis of the sectors of fabric, the sulfur pollution associated with the different wind directions can be estimated. The appendix of the report contains a discussion of observations on the intensity of ultraviolet and visible rays at Rochdale, with graphic analysis.

- 672 THE EFFECT OF WELDING ON THE EYE. D.M. Natanson and D.P. Vinogorow. *Viestnik Opt.* 10, pt. 2, 280 (1937). (Russian).

A study of 244 welders shows that no serious or permanent ocular inflammations or deleterious effect on visual acuity or visual fields are produced by welding. However, chronic electric ophthalmias are frequent, and corneal sensitivity is considerably reduced. The probable causes are light, flying particles of metal and chemical vapors. Lenticular opacities are not attributable to this occupation.

- 673 EXPERIMENTS ON A PHYSICAL QUALIFICATION TEST FOR WORK WITH X-RAYS. M. Sgalitzer and E. Ungar. *Strahlentherap.* (German) 58, 701-9 (1937).

There are great individual differences in radiation sensitivity of the blood-forming organs, and physical tests should be made to determine sensitivity. The leucocytes should be counted before exposure and on the 11th and 14th days after exposure.

- 674 INDUSTRIAL RADIUM DAMAGE. L. Teleky. *Wien. klin. Wchnschr.* (German) 50, 619-23 (1937).

A review of industrial injury from radium, as observed in clinics, in industries producing and using radium preparations, and in mines. The results of exposure include skin affections, damage to bones and blood, all occurring after a relatively short exposure, and tumors after long exposure or latent period. Bronchial cancer results from inhalation, and bone sarcoma from absorption from the digestive tract.

CLINICAL ASPECTS AND THERAPY OF INDUSTRIAL X-RAY DAMAGE. F.F.Freund. Strahlentherap.(Proc. 1st Congress of the Austrian X-ray Society in Vienna) (German) 58, 694-6 (1937).

We have no information on this paper except that it is a general review.

676 MEASUREMENTS OF RADIATION PROTECTION. K.G. Zimmer. Strahlentherapie 59, 671-9 (1937)
X-rays and gamma rays cause cell injury which is transmitted to the next generation of cells, making any establishment of a tolerance dose impossible, since that depends on restitution ability. Exposure of persons to radiation, therefore, must be reduced as much as possible, and measurements of radiation must be made by equipping workers with automatically registering apparatus. Condensation ionization chambers are best for this purpose. One such chamber put on the hand and one at the head of a nurse employed in the preparation of radium applicators showed that the accepted tolerance threshold of 0.2 r. per day was always exceeded at the back of the hand, and often at the head. Working conditions, therefore, must be improved.

677 PROTECTION IN THE USE OF ROENTGEN RAYS. A. Brandt. Fortschr. a.d. Geb. d. Roentgenstrahl. 55, 25-8 (1937).

The author suggests that the radiation hazard is much greater in technical than in medical occupations. There are longer exposures and greater amounts of radiation in the former, and persons exposed are engineers not medically or hygienically trained. Therefore the suggested tolerance dose of 0.00001r per sec. is not applicable. The author recommends compulsory reporting on the part of factories, measurement of radiation and medical supervision of workers, including total and differential white blood corpuscle counts at intervals.

678 EXPOSURE TO X-RAY IN INDUSTRY. REPORT OF A CASE. M.M. Kronenberg and Walter Shriner. Ind. Med. 6, 532-3 (Oct., 1937).

A fluoroscope was used in the examination of packaged goods. It was guaranteed ray-proof by the manufacturer, however, dental films attached to the wrist, front of the chest, and cap of the operator were found fogged in a week, while one on the back was not. The machine was then more completely ray-proofed and suitable eye shields were provided. The occurrence is given as an illustration of the care an employer must use to protect himself from possible suits.

679 MEASUREMENT OF RADIATION OF PERSONNEL IN RADIOLOGIC WORK AND PROTECTIVE MEASUREMENT AGAINST GAMMA RAYS. A. Feller and Langer. Acta Radiol. 18, 546-51 (Aug. 31, 1937) (Swedish).

A case in which a surgeon and his staff were found affected by radiation is reported. The measured quantity of radiation showed it to be far above the tolerance dose, and the greatest amount was found to be received in the manipulation of moulages. After a movable protection wall had been set up and the manner of handling the moulages had been improved, radiation on the body fell well below the tolerance dose.

680 AN ATTEMPT TO INHIBIT THE DEVELOPMENT OF TAR-CARCINOMA IN MICE. J.R.Davidson. Can. Med. Assoc. J. 37, 434-40 (Nov., 1937).

As the result of 6 years' observation of over 600 mice, it seems to be fairly well demonstrated that the tumor threshold of the mouse can be lowered by tar-irritation, and raised or maintained at a constant level by breeding and diet, with varying dosages of vitamins in the diet, especially A,B, and E. Completion of the series will require another year, and will show whether the high vitamin diet now used will be sufficient or will have to be increased with age, and will permit determination of the tumor threshold in the animals with low vitamin diet.

- 61 CANCER OF THE LUNG: A CRITICAL SURVEY OF 100 CASES. C. Harvey. Med. J. Australia 1, 565-72 (1936). Abstracted in Am. J. Cancer.

A survey of 100 cases of cancer from 1910 to 1935 seems to indicate that there has been some real increase in the incidence of the disease. Over half occurred between the ages of 41 and 60. An occupational influence is suggested by the large percentage of patients (38%) exposed to noxious inhalatory stimuli and of those engaged in out-of-door pursuits (25%).

- 62 INDUSTRIAL DERMATITIS AND ITS PREVENTION. Louis Schwartz, MD, Medical Director, Dermatoses Investigations, U.S. Public Health Service. Nat. Safety News 36, 34-6 (Nov., 1937); Safety Eng. 74, 7-10 (Nov., 1937).

This paper is a brief review of the subject of industrial dermatitis. There are at least 20,000 cases of occupational skin diseases annually in the United States, of sufficient severity to lose time from work, and about 65% are dermatoses. The total number in all degrees of severity is probably about 250,000 cases yearly. Factors involved in the cause of dermatitis include individual susceptibility, diet, age, presence of other skin diseases and lack of cleanliness. The chief causes are alkalis, oils and greases, solvents, acids, corrosive chemicals and plants. Symptoms, diagnosis and treatment are discussed briefly, but emphasis is laid on prevention, including cleanliness, the use of carefully selected protective ointments as a temporary measure, and pre-employment examinations. Treatment without cessation of work is recommended when the case is not too severe. Proper legislation is advocated, and factory inspection by insurance carriers, in addition to complete reports of all cases is urged. (Reprints are probably not obtainable, but the two Bulletins next mentioned are recommended for a fuller knowledge of the subject.)

- 683 SKIN HAZARDS IN AMERICAN INDUSTRY. Part I. Louis Schwartz, U.S. Public Health Bull. no. 215. Obtainable from the Superintendent of Documents, Washington, D.C. for 15 cents, cash.

This bulletin was originally issued in 1934, but has been reprinted and is now available. Each of a number of industries is considered in a separate section, including causes, symptoms with illustrations, treatment and prevention. The following industries are included: rubber, oil refining, synthetic dye manufacture, candy making, silk, linseed oil, manufacturing, perfume and insecticides.

- 684 SKIN HAZARDS IN AMERICAN INDUSTRY. Part II. Louis Schwartz. U.S. Public Health Bull. no. 229 (1936). Obtainable from Supt. of Documents, Washington, D.C. for 15 cents, cash.

This Bulletin is similar in plan to the preceding, and includes the following industries: manufacture of synthetic resins and waxes, leather manufacture, fur industry, manufacture of artificial silks, fabric dyeing, wearing and handling dyed fabrics, and manufacture and use of insecticides and fungicides, alkalis, calcium cyanamide, chromic acid and zinc chloride.

- 685 DERMATITIS AMONG A GROUP OF OFFICE WORKERS FOUND NOT TO BE OF OCCUPATIONAL ORIGIN. Louis Schwartz and Marion E. Sulzberger. U.S. Public Health Repts., 52, 1441-7 (Oct. 15, 1937). Obtainable from Supt. of Documents, Washington, D.C., for 5 cents, cash.

A supposed outbreak of occupational dermatitis among a group of 750 office workers was investigated, and from a study of the cases and of the work processes and from the results of patch tests performed with the materials handled it was found that the skin diseases were of various kinds and were not of occupational origin.

In an investigation of 12 kinds of carbon papers and of a factory where carbon papers, typewriter ribbons, hectograph ribbons and hectograph inks are made no cases of occupational dermatoses were found. Before a diagnosis of occupational dermatitis is made in an office worker, the physician should obtain an accurate clinical history, should study at first hand the actual work performed, and should make patch tests with the substances handled by the worker. If he neglects to do this, he may cause unjustified alarm among the workers and unnecessarily disrupt the business of the office. Proved cases of occupational dermatitis from carbon paper and carbon copies are exceedingly rare. - From the author's summary.

- 686 TORCH OIL DERMATITIS. Adolph G. Kammer and Richard H. Callahan. J.A.M.A. 109, 1511-7 (Nov. 6, 1937).

A number of workers handling torch oil developed dermatitis of the hands. An extensive investigation disclosed that there is probably an interrelationship between contact with torch oil and the existence of a focus of superficial fungous disease. The fungus did not come from the torch oil, and no case of dermatitis was seen in workers who did not also have interdigital epidermomycosis of the feet. The therapeutic measures usually applied to fungous infections were successful. The demonstration of a focus of fungous disease is not enough to warrant the incrimination of that infection in the development of an industrial dermatosis. Such foci probably exist almost universally among workers at the present time.

- 687 INFECTIVE WARTS IN WORKERS USING BONE-GLUE. A.I.G. McLaughlin and J.W. Edington. Lancet 233, 685-6 (Sept. 18, 1937).

An outbreak of warts, mainly on the back of the hands and fingers, occurred among workers in a cardboard-box factory. All those affected came in contact with bone-glue. The warts were of an infective variety, but the glue was found free from the virus, and was also heated above the lethal temperature for the virus. However, the glue was used after cooling, and the fingers and knuckles were constantly covered by the glue. It developed that the infection was originally introduced by some girl who had become infected outside the factory, and the infection spread through contact with the glue pots. The outbreak ceased on elimination of the infection.

- 688 STUDIES ON THE SENSITIZATION OF ANIMALS WITH SIMPLE CHEMICAL COMPOUNDS. IV. ANAPHYLAXIS INDUCED BY PICRYL CHLORIDE AND 2:4 DINITROCHLOROBENZENE. K. Landsteiner and M.W. Chase. J. Exp. Med. 66, 337-51 (Sept., 1937).

These substances produce contact dermatitis in man, and it is possible to induce true anaphylactic sensitization in guinea pigs by intravenous injection of protein conjugates and by the Dale technic. This furnishes strong evidence for the formation of antigenic conjugates following application of substances of simple chemical constitution. Since the anaphylactic state is induced by the same methods that cause cutaneous sensitivity, it seems evident that the formation of conjugated antigens offers an explanation of the skin effects also.

- 689 METHOD OF QUICK AND EXACT MEASUREMENT OF VERY SMALL AMOUNTS OF CARBON MONOXIDE HEMOGLOBIN IN BLOOD. I. May. Arch. f. Gewerbepathol. u. Gewerbehyg. 8, 21-5 (1937) (German).

The method involves the use of the Pulfrich photometer with mercury vapor light and a passing filter. Carbon monoxide hemoglobin quantities of about 2% can be measured and gradations of 0.5% are recognizable. Only 0.1 cc. of blood is necessary, and only 8 minutes are required.

- 690 TURPENTINE ECZEMA IN SWEDISH PAINTERS. E. Thrysin. Hygeia (Swedish) 99, 268-87 (1937).

In order to solve the problem of turpentine eczema in painters it is first necessary to determine what constituent of turpentine is responsible, and the author analyzed a number of preparations sold as oil of turpentine. There are 5 classes of "turpentine": (1) true balsam oil of turpentine, obtained by tapping certain trees; (2) sulfate oil of turpentine, a by-product of sulfate cellulose production; (3) charcoal oil of turpentine, produced by dry distillation of wood; (4) mixtures of true turpentine with mineral oils, and (5) "animal oil of turpentine" which contains mineral oils only. Some in the fourth class are fraudulently labeled, also in the last class if sold as turpentine. Tests and standards in use in various countries are described. A process of purification by fractional distillation is described with diagrams. Standards for purity should be imposed.

- 691 SKIN DISEASE IN A VARNISHING PLANT AND ITS INVESTIGATION WITH SPECIAL REGARD TO SKIN TESTS. G. Munkwitz. Arch. f. Gewerbepathol. u. Gewerbehyg., 8, 83-112 (1937). (German).

An attempt was made to determine by skin tests which of the materials used in a varnishing plant caused eczema. He concluded that a combined factor was involved the solvent paved the way for the injurious priming dye. No results were obtained on constitutional influences, on account of the small number of cases of eczema - 30 out of 240 persons examined.

- 692 SKIN INJURY FROM OCCUPATION, SPORT, ACCORDING TO SEASON AND FROM COSMETICS, INCLUDING A SUPPLEMENT OF FIRST AID IN SUDDEN SKIN INJURY. M. Oppenheim. Wien. med. Wchnschr. 87, Nos. 11, 12, 20, 24, 27, 30, 31 (1937).

The series consists of description of skin injuries having various external causes. The first four are concerned with industrial skin diseases, and fuller information will be available later.

- 693 THE ANTHRAX HAZARD. John N. McDowell, Div. of Industrial Hygiene, N.Y. State Dept. of Labor. Ind. Bull. 16, 393 (Oct., 1937).

Cases of anthrax occur occasionally, and may become fatal if proper precautions are not taken. The possibility of anthrax exists in all industries in which animal skins and hair are handled. Precautions include cleanliness and reporting all cases of cuts, accidents, pimples, sores or abrasions of the skin or any illness, no matter how harmless they may seem.

- 694 ACTION OF HYDROFLUORIC ACID ON THE SKIN. H. Scheuermann. Dermatol. Wchnschr. 104, 661-7 (1937). (German.)

A case of action of hydrofluoric acid on the skin is reported in which a 2-minute exposure to the vapor caused severe disturbance of the cutaneous and subcutaneous cell tissue with affection of the bone. No effect was seen a few hours after exposure, but the disease reached its crisis on the 5th to 6th days.

- 695 BLOOD VESSEL DAMAGE FROM PROLONGED VIBRATION OF COMPRESSED AIR TOOLS AS AN INDUSTRIAL DISEASE. E. Junghans. Arch. f. klin. Chir. (German) 138, 466-79 (1937). Little nodules found on the forearm of a castings polisher showed changes that resembled those seen in Buerger's thrombangitis obliterans, and produced by prolonged vibration. The author suggests compensation of this as an industrial disease.

References to Recent Literature - 23

- 696 JOINT INJURY FROM WORK WITH PNEUMATIC TOOLS. Rostock. Fortschr. a. d. Geb. d. Roentgenstrahl. (German) 55, 21-3 (1937).

Continued work with compressed air tools causes osteochondritis in the hands, elbow or shoulder, depending upon which joint is affected most by the vibration. They can also be caused by other hard work. The author gives some idea of the relative frequency of the condition.

- 697 MINIMUM-WAGE LEGISLATION IN THE UNITED STATES AS OF JULY 1, 1937. U.S. Monthly Labor Rev. 45, 381-93 (Aug., 1937).

Minimum wage laws are now in effect in 22 States. An impetus to such legislation was given this year by the United States Supreme Court, in effect reversing an earlier decision that had declared the minimum-wage law of the District of Columbia unconstitutional. As a result of that decision, several jurisdictions have revived their minimum wage laws, considered dormant since 1923. Now in addition to the 22 States, minimum-wage laws are also in effect in Puerto Rico and the District of Columbia. The article includes the principal provisions of all the minimum-wage laws in effect in 1937.