

IN THE DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF COLUMBIA

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

(A) News Items

- 1 GOOD HOUSEKEEPING AND SAFETY IN FOUNDRIES AND INDUSTRIAL CODES AND OCCUPATIONAL DISEASE LEGISLATION. Reprint No. 37-30, American Foundrymen's Assoc., Inc., Chicago, (1937). 61 pp. price \$1.50
This booklet consists of papers presented at the last meeting of the association. Among the subjects treated are eye and respiratory protection in the foundry, silicosis, good housekeeping in the foundry, industrial codes and their applications, and occupational disease legislation. Abstracts of these papers will appear in a future bulletin.
- 2 COVERED HOPPER CAR FOR GRAVITY UNLOADING. The following note was sent to us with the statement that it might be of interest to the members of the Foundation.
"The dust problem in loading and unloading raw materials shipped by rail in bulk has long been known as a serious hazard. In most instances fine granular products have been pulled out of a box car by means of a power shovel operated by one or more men within the dust filled car. Not only is the car itself loaded with dust, but pulling the commodity into a chute at the edge of the box car allows a good percentage of the material to be blown into other near parts of the plant.
"This problem has become so acute in industries using silica sand, powdered arsenic, burned lime and other hazardous commodities that the General American Transportation Corporation, 135 South LaSalle Street, Chicago, have developed, built and leased to shippers or consignees, a covered hopper car that will unload dry granular products by gravity. An inexpensive track hopper is usually used in conjunction with the car and a boot between the hopper and the car makes the unloading operation both dust proof and economical."

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

- 3 DUST HAZARD AMONG FOUNDRYMEN. L. H. Osmond. Am. J. Roentgenol. and Rad. Therapy 38, 122-8 (July, 1937). (See note on final page.)
The author reports roentgenological and clinical surveys of the foundry employees of a large plant in Pittsburgh. All workers undergo an annual physical examination, and careful histories are taken showing the location of each man's work since he entered the company's service. Dust counts are available for each location. They range from 13.1 million particles per cubic foot in the molding room to 44.9 million in the coremaking department, but a count of 240 million was obtained during the night shakeout. Chemical analysis of the dust showed 52% free silica and 10.3% calcium and magnesium silicates. The incidence of simple silicosis in the entire group, including many who had worked less than 5 years was 5.5%. In those with over 20 years' experience, silicotic fibrosis was found in 44%, including 32% without infection and 12% with infection. The disability of those without infection was practically nil, while it was frequent in those who had complicating infection. Little correlation between incidence and dust concentration was observed. The death rate among all these workers was 517 per

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100,000, as compared with 89 per 100,000 for all moles in Allegheny County over 30 years of age. The men now wear respirators, but tests made at the level of crane runners showed 42.6 million particles per cubic foot in the free air, 39.3 million beneath the respirator with an old cartridge and 12.2 million with a new cartridge.

- 4 SILICOSIS IN MODERN FOUNDRIES - STUDY OF THE INCIDENCE. J.F.Kelly and R.C.Hall. N.Y. State J. Med. 37, 478-81 (1937).
Three foundries in Utica were surveyed; two were modern plants, fitted with latest means of dust protection and employing 150-200 men each, while the other, employing about 50, used no special precautions. Of the 403 cases examined, 4 cases of first degree silicosis, 1 of silicosis with tuberculosis, and 30 of "dusty lung" were found. The term "dusty lung" was applied where an exaggerated pulmonary pattern or increased perilymphatic fibrosis was shown. Two of the cases of silicosis were found in the small factory. Three of the cases occurred among molders and one among the "shakers-out." The authors conclude that their investigation showed a very low incidence.
- 5 REPORT ON THE SIGNIFICANCE OF SANDBLASTERS' SILICOSIS IN THE FOUNDRIES OF OBER-HESSSE AND HESSE-NASSAU. H.R.Buettner. Verh. Deut. ges. f. Inn. Med. 48, 178-82 (1936).
Pneumoconiosis was diagnosed in 20% of 147 sandblasters examined, and 2 cases were classified as severe. Seven out of 53 who had worked for 1 year had definite pneumoconiosis and 5 had primary pulmonary tuberculosis, while 9 cases were found in those with occupational exposure of 5 to 24 years. The x-ray films in 18 of 28 cases of pneumoconiosis resembled those of definite military tuberculosis. In two large glass works investigated, 10 and 44% of the sandblasters, respectively, had pneumoconiosis; imperfect protection was afforded in the latter works.
- 6 FILTRATION OF RESPIRED AIR AND ITS SIGNIFICANCE IN PNEUMOCONIOSIS. G. Lehmann, Ergeb. d. Hyg., u. Bact. 19, 1-87 (1937). (German).
This paper is a summary and amplification of the author's work on filtering ability of the nose, some of which has been reported in these abstracts. An apparatus for testing nasal filtration is described. The nasal mechanism for arresting dust is described fully. Experiments on the relation between nasal filtration and pneumoconiosis are reported; good dust filtration is found to be a protection against the early development of severe pneumoconiosis. An investigation of wearability and efficiency of dust protective measures is also included. The experiments have been carried out very thoroughly and are of great interest.
- 7 THE EXCRETION OF SILICA IN URINE AFTER ORAL ADMINISTRATION OF SILICA AND SILICATE DUSTS AND THE SOLUBILITY OF SILICA AND SILICATE DUSTS IN ACID AND ALKALINE SOLUTIONS AT 37°C. A.G.R.Whitehouse, British Colliery Owners' Research Association, Royal School of Mines, London, England. J. Ind. Hyg. & Toxicol. 19, 590-7 (December 1937). Reprints obtainable from author.
It is known that silica dust taken into the stomach of a dog causes a definite increase in urinary output of silica, and the author made a similar human investigation, using himself as subject, swallowing various quantities of quartz, flint, precipitated silica, and whinstone, a mixture of silicates containing no free silica. Various precautions were found necessary for accurate results; the input of liquids had to be kept constant, water low in silica had to be used, and beer was avoided. The daily excretion of silica was definitely increased with very fine flint dust, the silicate dust and precipitated silica; in the case of silicic acid the increase was much greater.
In the second part of the investigation, the solubility of silica and silicate dusts in solutions of known acidity and alkalinity was determined at the body temperature, 37°C. This procedure was necessary because the results of the feeding experiments did not reveal whether the dusts dissolved in the gastric juice

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or in the alkaline body fluids. The amount of silica dissolved by 0.1 normal sodium hydroxide was greatest with flint, lower values being obtained from quartz, coal-measure sandstones, granite and whinstone, while a sample of stone dust (about 5% free silica) gave much the lowest figure. With 0.1 normal hydrochloric acid, as solvent, the dusts arranged in order of solubility were whinstone, granite, sandstone, quartz and flint. The amount of silica dissolved by 0.2 normal sodium carbonate was much greater than by 0.1 n. sodium hydroxide, while the reverse of this was the case with granite. The influence on the rate of solution of such factors as particle size and ratio of dust to solvent are shown. In view of the facts determined, great care should be exercised in attempting to correlate urinary excretion of silica with silicosis.

- 8 ETIOLOGY, EPIDEMIOLOGY AND PROTECTION AGAINST LUNG INFLAMMATION OF WORKERS IN THOMAS SLAG MILLS. H. Gundel and H. Fischer. Ztschr. f. Hyg. u. Infection. (German) 120, 66-87 (1937).

Statistical data on incidence and fatal cases of pneumonia in Thomas slag workers are presented, both for early days and recent years, during which there were several epidemic-like outbreaks. The authors agree with others in believing that the dust weakens resistance of lung tissue to bacteria and paves the way for inflammatory diseases of the lungs.

Pneumonia of types II and III was found abundantly in workers in Thomas slag plants. Therefore the case is one of real infectious disease, the frequent occurrence of which is determined by a special hazard. The authors recommend elimination of all workers with catarrh of the upper respiratory tract. They have also begun active immunization of personnel of one industry against pneumonia of types I, II, and III. Animal experiments on the effect of magnesium in Thomas slag are being conducted.

- 9 MINERALOGIC AND PHYSICAL PROPERTIES OF MINERALS AND THEIR DUSTS WITH REGARD TO THE DUST HAZARD IN STONE QUARRYING, DRESSING AND MANUFACTURING. G. Hass. Zntribl. f. Gewerbehyg. u. Unfall. 24, 193-201 (1937).

A comprehensive description of silicates and minerals under the heading of "free silica" and other minerals is given. The author's view is noteworthy in that he believes sericite may possibly be formed from feldspars by "disintegration processes" in the lungs. The author suggests, as others have previously, that the composition of a dust under certain conditions may be different from that of its parent substance. Quartz mixtures in fluor spar, barite and roofing slate are described and the role they play in dust formation is discussed. The chemical and physical properties, occurrence, importance and technical uses of various kinds of stone are presented in a table.

- 10 THE EFFECTS OF COAL SMOKE OF KNOWN COMPOSITION ON THE LUNGS OF ANIMALS. Lucy Schnurer and S. R. Haythorn. Am. J. Pathol. 13, 799-808 (Sept. 1937). Reprints are obtainable from Dr. Haythorn, Singer Memorial Lab., Allegheny General Hospital, Pittsburgh, Pa.

An experimental method is described by which finely divided carbon particles in an almost pure state may be successfully introduced into the alveoli of the lungs. Immediately after exposure to the smoke inhalations the lung lesions were those of non-occupational anthracosis. The animals kept under animal house conditions for several months to a year after exposure to smoke developed fibrous reactions about the carbon deposits with the formation of collagen strands. The resulting lung changes were analogous to those of a milder grade of bituminous as seen in soft coal miners. The method provides a way of experimental study of the actual relation of carbon deposits to the common respiratory infections - Author's summary.

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References to Recent Literature - 4

- 11 PNEUMOCONIOSES OF THE WORKER. K. Wider. Ztschr. f. Gewerbehyg. u. Unfall, 44, 131-5 (1937).
Silicosis became compensable in Austria on April 1, 1935. Since then, 206 cases have been reported in the Workmen's Compensation Office; of these, 171 are miners, some from lignite mines. In the metal industry, most cases are among sandstone grinders and sandblasters.
- 12 PULMONARY ASBESTOSIS. IV. THE ASBESTOS BODY AND SIMILAR OBJECTS IN THE LUNG. Kenneth M. Lynch, M.D., Dept. of Pathology, Medical College of the State of South Carolina, Charleston, S. Carolina. J.A.M.A. 109, 674-8 (Dec. 11, 1937). Reprints probably obtainable from author.
The typical asbestos body (also called asbestosis body) is an object 10 to over 100 microns and 1 to 12 microns thick and is composed of a central translucent fiber or needle crystal of asbestos with an enveloping shiny golden or brownish gelatinous substance constructing various architectural figures. Sometimes it is beaded or clubbed and sometimes spherical. A Prussian blue reaction for iron is given. These bodies may be found at various places in the lung, especially in the bronchioles, the alveoli and in the tissues along the lymphatic route; usually shorter at a distance from the alveoli, but often surprisingly long, considering the distance they have traveled. They sometimes cause fibrosis around them, but not necessarily. They are also found in the sputum of those exposed to asbestos dust, but their presence or absence in the sputum does not indicate the presence or absence of asbestosis; their presence only shows that exposure to the dust has occurred. Similar bodies have been found in persons exposed to coal dust, and in others who have died of heart failure, rheumatism and arteriosclerosis, without known heavy dust exposure. Exposure to asbestos dust does not always produce asbestos bodies; bare fibers have been found in the lungs of animals. The author has seen silica particles similarly enveloped, in cases of silicosis, not always so highly colored. It is suggested that other fibrous or crystalline dusts not yet studied may form similar bodies.
- 13 BLOOD EXAMINATIONS IN PULMONARY FIBROSIS OF HEMATITE IRON ORE MINERS. J. Craw. Tubercle, 19, 8-18 (October 1937).
In radiographic examinations of hematite miners in West Cumberland (England), the hematite accumulations show a definite and dense shadow, apart from any accompanying fibrosis, and there is a tendency to diagnose silicosis when a miner complains of unfitness and his pulmonary symptoms and the x-ray of the test show generalized nodulation. The silica content of inhaled dust, however, is low, and in spite of 20 to 30 years' work and general nodulation in all lung fields, the miners are perfectly fit for work and are not short of breath. For these reasons hematological work was instituted as an essential in diagnosis. Routine procedure included the following determinations: (1) sedimentation rate of the red cells; (2) total white cell count; (3) differential white cell count, and (4) the polymorphonuclear count of von Bonsdorff. The findings in 6 cases are given, with case histories. Of the 50 hematite miners studied, 20 normal miners had no complaint of breathlessness and no x-ray or physical signs of pulmonary fibrosis, while 30 complained of pulmonary disability in varying degrees, with positive x-ray findings. Many miners develop a pure pulmonary siderosis without accompanying fibrosis, and their blood picture is normal. Sidero-silicosis of uncomplicated type shows a definite increase in percentage of lymphocytes, and the ratio of polymorphonuclear cells to lymphocytes becomes 1 or less. The sedimentation rate and nuclear count are normal. When infection is present, the sedimentation rate increases, the nuclear count increases and there is a leucocytosis which may approach a septic count. Although the results are preliminary, the method is recommended for aiding the differential diagnosis of siderosis without fibrosis and of sidero-silicosis, and for detecting tuberculosis or other infective agents at an early stage.

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- 14 RANGE OF ELECTROTOR METER DEMONSTRATED BY DARK-FIELD COUNT. S.C. Blacktin. J. Ind. Hyg. & Toxicol. 19, 579-89 (December 1937).

The electrotor meter, invented by the author, is an instrument for dust determination on the same general principle as the Owens jet counter, but the dust is deposited on a circular disk of celluloid or ebonite which rotates as the plunger is pushed and is electrified at the same time by friction. Six orifices are provided, one at the center of the disk and the others at varying distances from the center, and any one or any combination of orifices can be used for the same air sample. The dust, then, is deposited at the center or in one or more of a series of concentric rings, or both at the center and one or more rings, each of which is 1 mm. in width. In light dust concentrations, the center alone may be used; in very dusty air, several rings may be used simultaneously. Since equal quantities of dust are deposited in the various rings and the area of the total deposit varies with the distance from the center, the number of particles per unit area decreases correspondingly, and at least one ring will be found where the dispersion is neither too light nor too heavy to count. This construction enables the instrument to be applicable to dust concentrations varying from 5 to 1.5 million particles per cc. (140,000 particles to 42 billion particles per cubic foot), which is a much wider range than is attainable by any other instrument. The figures given apply to darkfield under a magnification of 450. Rough estimates of dustiness may also be made by inspection of the record. (A modification by which dust deposits can be both counted and weighed has been described in our abstract no. 536. As yet no reply has been received to our inquiry for earlier reprints and other information.)

- 15 DUST CONTROL IN THE MANUFACTURE OF ARTICLES FROM REFRACTORY MATERIALS. F. Prockat. Staub. no. 4, 16-37 (January 1937) (German.)

The use of water during crushing of quartz is not always sufficient to prevent dust, as some dust arises when the stamp or hammer is actually crushing the quartz. The dust hazard can be remedied by a suitable exhaust system. Molding of refractories can often be carried on in open air. Respirators should be used only when no other remedy is available. A German law of April 1, 1937 requires employers to pay special attention to silicosis prevention.

LIST OF RESPIRATORY PROTECTIVE DEVICES APPROVED BY THE U.S. BUREAU OF MINES.

H. E. Schrenck. U. S. Bur. Mines, Information Circular no. 6952 (August 1937). Obtainable from the Division of Information, U.S. Bureau of Mines, Washington, DC. The list of approved respiratory devices is brought up to date in this issue. The present list includes all devices approved up to April 10, 1937, a total of about 40, with names and addresses of manufacturers.

- 17 PROCEDURE FOR TESTING SUPPLIED-AIR RESPIRATORS FOR PERMEABILITY. U.S. Bur. Mines Schedule 19A. (Aug. 9, 1937). Obtainable from Supt. of Documents, Washington, D.C., for 5 cents, cash.

This schedule describes the present methods used by the Bureau of Mines for testing supplied-air respirators, the standards used, and the method of approval. (A similar schedule for filter-type respirators was issued as no. 21 in 1934.)

- 18 INDUSTRIAL EXHAUST VENTILATION. RATE OF AIR FLOW THROUGH HOODS. John L. Alden. Heating and Vent. 34, 47-52 (December 1937). No reprints are available at present, but may be when the series is completed.

This paper is the fourth in the series on the subject. (See abstracts 548, 597 and 598.) The air volume to be drawn through a hood can be computed only after the general shape and location of the hood are established. The minimum basis for the necessary assumption is a freehand sketch reasonably drawn to scale.

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The preparation of this sketch must take into account most of the factors treated in the former papers, which are summarized, including elimination of unnecessary air contamination, control of dust-dispersing currents by baffles or shields, and by currents of greater intensity, making the exhaust velocity greater than the velocity of escape at all points, and locating the hood so that high-speed particles will be thrown into it. No general statement can be made as to the velocities required to prevent the escape of dust and dusty air, and the engineer must lay his own foundation for hood design. A simple exploratory hood is described and illustrated. Its volume rate of flow can be measured and plotted against the static suction. It can be moved until the most satisfactory location is found. Such equipment will pay for itself in lessened first cost of the exhaust system.

Average face velocities of 500 to 1000 feet per minute are usually sufficient for hoods partially or wholly enclosing the dust source. Most woodworking and grinding hoods fall in this category. Figures are given for several examples. Experiments with a mixture of stones and coffee beans showed that relatively low velocities will pick up fairly heavy particles. The coffee beans alone were picked up at 1650 f.p.m. Satisfactory pipe sizes and suction for a variety of manufacturing machinery are given in a table. Formulas are given for calculating necessary air volume entering the hood.

The coefficient of entry is discussed, with experimental results on different types of orifices. Of these types, the well-rounded nozzle and the thin plate orifice, are extensively used and have been investigated thoroughly, but coefficients of some of the others are not so well established. The loss in percent velocity head is plotted against coefficient of entry, and the method of calculation is given.

19 SAFETY IN THE ENAMEL PLANT. E. Eckels. Coram. Forum 4, 4 (Dec., 1937).

A general paper reporting safety precautions in use at the Eric plant of the General Electric Co., including mechanical safeguards and prevention of excess pressure in spray barrels. The use of respirators in spraying operations and instruction of operators regarding lead and silicosis hazards is urged. Spray booths have been improved and good respirators and other protective equipment are now available, and silicosis has lost its first place as a hazard in the enamel plant. The present evils in the enamel plant, as elsewhere, are the small things not attended to or properly supervised.

20 SOME NOTES ON THE PROPERTIES OF CHILLED METALLIC SHOT AND GRIT USED IN SAND-BLASTING. J.E.Hurst and J.H.D.Bradshaw. Foundry Trade J. 57, 447-8, 474-6, (Dec. 9 and 16, 1937).

Metallic shot and grit are used extensively in Great Britain instead of sand for abrasive blasting. The term "shot" denotes more or less spherical particles, and "grit" those with sharp edges. They are used in a wide range of sizes, from 100 mesh and coarser, for various types of work. This paper is a discussion of chemical composition, performance data, nozzle wear, life of the shot and grit, strength properties, microstructure and grading, with results of various tests. No general conclusion is reached, because the necessary properties vary widely with the exact nature of the work. Additional investigation is recommended.

21 A NEW ELECTROSTATIC PRECIPITATOR. G.W.Penney. Elec. Eng. 56, 159-71 (1937).

Reprints are obtainable from the author, address Research Laboratory, Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa.

The author describes a new type of plate to plate precipitator with pre-ionizing wires, and states that as a result high air cleaning efficiencies are now possible without the production of objectionable concentrations of ozone or oxides of nitrogen. The precipitators have been found to give excellent results in removing smoke, soot, pollen causing hay fever and asthma, and hazardous dusts such as silica. Tests with the impinger showed a dust collecting efficiency of 99.5%.

- 22 AIR CONDITIONING FOR INDUSTRIAL WORKERS. Charles L. Hubbard. Power Plant Eng. 41, 681-2 (November 1937).

The use of air conditioning in industry is growing, not only for protection against injury, but also for comfort and greater efficiency. The present brief paper deals exclusively with the latter aspect. Physical comfort depends largely upon bodily temperature, and this in turn upon the relation between the rates of heat production and dissipation; that is, heat must be removed from the body at the same rate at which it is produced. The principal factors affecting this condition are temperature, humidity, and air motion, and between certain limits various combinations of these will give practically the same result. The "effective temperature" is any combination of the 3 factors that give the same result as saturated still air at 70°F. Tables, abridged from more elaborate ones published by the A.S.H.V.E. are presented, showing such combinations for summer and winter conditions, for still air and for a velocity of 200 feet per minute. It is pointed out that too great a contrast between indoor and outside air must not be introduced. In general it should not exceed 10°F., but in special cases modifications are necessary.

- 23 AIR CONDITIONING IN FACTORIES. C.W.Price. Proc. Royal Soc. Med. 30, 1544-7 (October 1937.)

The author believes that conditions in different industries are too varied to allow adoption of complete air-conditioning methods. In Great Britain the problem is mainly one of ventilation and adequate heating, supplemented with air cleaning where necessary.

- 24 AIR PURIFICATION AND ALLERGIC CONDITIONS. E.M.Fraenkel. Proc. Royal Soc. Med. 30, 1547-50 (October 1937).

The author has devised a mask containing fine granular silica gel and active charcoal. The mask is said to retain particles down to 0.01 micron and to be impermeable to pyridine, capronic acid, scotch, tobacco smoke, ammonia, chlorine, phosgene, and sulfur dioxide. It is recommended for protection against allergens and poisonous war gases.

- 25 FORD MOTOR COMPANY SETS HIGH AIR CONDITIONING STANDARDS. J.J.Flores. Heating, Piping & Air Cond. 9, 429-32 (December 1937).

The paper is a general description of air conditioning in the plants of the Ford Motor Co., the largest single user of modern air conditioning. The program started many years ago with controlling of air required in several basic processes of manufacture, and varied types of air conditioning are now used for special purposes; for instance, a temperature of 30°F. and air current of 70 miles per hour, to test automobiles under severe conditions. However, the rapid extension of the program to the strictly human comfort field is more significant. Air conditioning is now used in a large section of the main plant, offices, laboratories and a number of branch assembly plants. Returns cannot be measured directly, but must be evaluated from increased efficiency, more accurate work, better health, and especially increased good will. Specifications range from 80°F and 45% humidity in the hottest days to 70°F and 30% humidity, in severe winter weather. Experiments on various methods of distribution, temperature and air filtration are undertaken by the company, and bidders are given full instructions on all requirements before deciding on equipment and installation.

- 26 SOME OBSERVATIONS ON THE HEALTH ASPECTS OF AIR CONDITIONING. W.J.McConnell, H.R.Fellows, M.G.Fellows and M.G.Stephens. Bulletin issued by Metropolitan Life Insurance Co., New York (1937) and obtainable from the Company.

An investigation of a group of 5,000 clerical employees working in completely air-conditioned offices, and an equal groups in offices that were not air conditioned but otherwise properly heated and ventilated, showed no measurable differences in the incidence or length of absences caused by upper respiratory

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diseases or from non-respiratory illness. When comfort is considered, however, quite satisfactory results, particularly in hot weather, were obtained from air-conditioning apparatus.

- 27 GOOD AIR IN WORKPLACES. W. Wietfeldt. Zentrbl. f. Gewerbehyg. u. Unfall. 24, 225-33 (October 1937) (German).
Natural ventilation should be used to the greatest possible extent for economical reasons. Where it is inadequate, local or central supplementary mechanical ventilation should be installed. Local ventilation is cheaper, but central systems have a wider range of application. Such installation should be entrusted to experts, as improperly made installations may be expensive and useless. Twelve fundamental principles outlined by the German Ministry of Labor are listed.
- 28 REPORT OF THE CONNECTICUT STATE DEPARTMENT OF HEALTH, BUREAU OF OCCUPATIONAL DISEASES. Dr. A. S. Gray, Director. pp. 155-221 (1936). Obtainable from above Bureau, Hartford, Conn.
This report departs from the conventional type of state document in being a series of technical papers describing investigations actually made. Among those reported are dust hazards, their estimation and control, as in foundries, rock drilling as a source of dust, prevention of contamination by organic solvents and chlorinated naphthalenes, carbon monoxide surveys and various dust problems.
- 29 MINES DEPARTMENT: FIFTEENTH ANNUAL REPORT OF THE SAFETY OF MINES RESEARCH BOARD, 1937. H.M. Stationery Office, London (1937). Obtainable from British Library of Information, 270 Madison Ave., New York. Price not given.
Most of the report is devoted to mine safety, including the development of an electrically driven firedamp recorder, improvement of lighting, factors relating to falls of ground, and haulage accidents, reduction of noise, protective clothing, and effect of radiation from walls on comfort in hot mines. Work on dust suppression and prevention continues. The Hay mist projector is of value where the temperature is not above 65°F, and the addition of moisture to the atmosphere has but a negligible effect on comfort. Where the temperature is much higher other equipment is desirable. A series of bag filters of 400 sq. ft. filtering area with a suction fan of 1200 cu. ft. per min. capacity has been found highly efficient. The study of the use of wetting agents in dust suppression is being continued.
- 30 SEVENTEENTH ANNUAL REPORT OF THE INDUSTRIAL HEALTH RESEARCH BOARD TO JUNE 30, 1937. H.M. Stationery Office, London, 1937. Obtainable from the British Library of Information, 270 Madison Ave., New York. Price not given. Fuller abstract in Journal of Industrial Hygiene, December 1937.
This is the latest annual summary of the work of the above Board. The subjects studied include fatigue, illumination, environmental conditions, a summary of literature on toxic solvents, scale of equivalent warmth, medical examinations for Post Office service applicants, accident proneness, vocational guidance and sickness among transport workers. The effects of exposure to alumina dust have been studied (see our abstract 434 in the September Bulletin.) In an investigation of silicosis in sandblasters it was not possible to conclude that sericite is an important causative factor. Silicosis has been defined for compensation purposes in accordance with well-recognized signs of disease and states of disability, but there are cases that do not present the recognized well-marked features, and are classed as "non-certifiable silicosis". A large scale investigation of such cases is planned.

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- 32 THE PLACE OF THE STATE IN SAFETY. August Sigurdson. Safety Eng. 74, 19-20 (Dec. 1937).

The author presents a brief account of progress made by the Industrial Commission of Wisconsin, particularly in securing cooperation by employers and employees. The policy of selling the safety idea, rather than compulsion and prosecution, has been kept uppermost. It is often more difficult to enlist the cooperation of employees than that of employers, but it has been accomplished by persistent effort on the part of safety workers.

- 33 SICKNESS AMONG MALE INDUSTRIAL EMPLOYEES DURING THE SECOND QUARTER AND FIRST HALF OF 1937. D.H.Brundage. U.S.Pub. Health Repts. 52, 1523-6 (Oct. 29, 1937).

Obtainable from Supt. of Documents, Washington, D.C., for 10 cents cash. Based on reports covering 184,000 males, the rate of sickness and non-industrial accidents for the first half of the year was about 15% higher than that for the same period in 1936 and 22% above the 5-year period, 1932-1936. The rate for respiratory disease in the first half of 1937 was 56.9 cases per 1000, which is 36% above that for 1936 and 49% above the 5-year average. Pneumonia has increased in the last 2 years, and the 1937 influenza rate was about 70% above the 1936 figure. Tuberculosis showed a decrease, and appendicitis increased. There was little variation in other diseases.

- 34 INDUSTRIAL DISEASES IN 1936 ACCORDING TO THE ANNUAL REPORT OF THE INDUSTRIAL TRADE ASSOCIATIONS. ARBEITSSCHUTZ (German) 10, 244-51 (1937).

In 1936, 5926 cases of industrial diseases were reported in Germany and 532 were compensated. Figures are also given for each year since 1929. A report follows giving the occurrence of industrial diseases according to groups of industries and the measures adopted for prevention. In the stone and mining industry, x-ray and medical examinations were made by experts, but many abuses are still present. In the metallurgical and rolling mill groups there are relatively large numbers of poisoning by lead and carbon monoxide and injury from Thomas slag dust. Cases of lead poisoning still run high among painters and iron construction industries, as do also pneumoconiosis cases among polishers. Introduction of silica-free grinding wheels and substitution of steel shot for quartz sand in sandblasting have progressed, and the medical inspection of sandblasters has improved. Benzene poisoning is frequent in the rubber casing industry and a fatal case occurred in a factory making printing dyes, but it is now possible to produce colors that contain little or no aromatic hydrocarbons. Attention is called to the use of bichromates in photoengraving.

- 35 THE EXPANDING ACTIVITIES OF STATE LABOR DEPARTMENTS. E.M.Stewart. U.S.Monthly Labor Rev. 45, 529-40 (Sept. 1937).

Administrative agencies have been created in several States and materially strengthened in others, in order to build up adequate machinery for administration and enforcement of the many recently enacted labor laws. State departments have been established in most of the Southern States, and existing agencies have been strengthened by unification in others, notably Arkansas, Indiana and Rhode Island. In Pennsylvania and other States long established labor departments have been reorganized and expanded in order to deal with a broadened program of labor legislation.

- 36 RECENT ADVANCES IN INDUSTRIAL HYGIENE AND MEDICINE. T.M.Ling. Published by P.Blakiston's Sons & Co., Inc., Philadelphia, 1937. 212 pages, price \$3.50.

The reviewer recommends this text as useful to newcomers in the field of industrial medicine who need the major problems presented simply. The first chapters deal with medical and supervision, industrial accidents and neuroses. Dust and its effects are discussed simply and clearly, and a chapter is devoted to lead poisoning. The treatment of gases and solvents is very brief.

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- 37 ABSOLUTE COLORIMETRIC DETERMINATION IN CHEMICAL TOXICOLOGY. H. Kaiser (German) Angew. Chem. 50, 632 (1937).
The following method for determination of the silica content of lungs is presented: the sample is ashed below 500°C, the ash is converted with freshly prepared soda solution, which is then diluted, filtered and neutralized with hydrochloric acid, and made up to 100 cc. Thirty cc. of the solution is dyed according to Urbach's method, employing molybdic oxide, hydroquinone and carbonate-sulfite solution. After destruction of the phosphorus-molybdenum-acid complex, the sample is measured photometrically and the silica content is calculated.
- (C) Papers on Industrial poisons, Cancer, Dermatitis, etc.
- 38 PROBLEMS ON THE TOXICOLOGY AND CLINICAL ASPECTS OF ACUTE POISONING FROM SOLVENTS. F. Luce. Gasmask (German) 9, 89-90 (1937).
Solvents used in industry are usually impure substances or mixtures, and the effect of each component must be considered. The effects of the constituents may be additive in mixtures, but that is not always true. The total vapor pressure of mixed solvents is necessarily higher than that of the pure substances. In the treatment of prolonged loss of consciousness, especially if epileptic seizures occur, generous rectal or subcutaneous doses of physiological dextrose or Ringer solution are recommended. The search for detoxifying antidotes must be continued. The nature of the "second attack" occurring after apparent recovery, especially after carbon tetrachloride poisoning, must be studied.
- 39 INDUSTRIAL TOXICOLOGY OF TODAY. D. Hunter. Pharm. J. 137, 514-5, 539 (1936).
The British legal aspects, symptoms and clinical treatment in cases of industrial poisoning by various inorganic and organic substances, chlorine compounds and toxic gases are described.
- 40 PRECAUTIONARY NOTES FOR USERS OF VOLATILE ORGANIC SOLVENTS. Home Office, Factory Department, Form 297 (London), June, 1937. Obtainable from British Library of Information, 270 Madison Ave., New York.
Part of the danger in the use of organic solvents is due to their being branded with trade names that conceal their composition. Any product of this kind should be assumed to be injurious by inhalation or by skin contact unless it has been proved safe under all conditions. Some compounds which are not toxic may cause soreness of the eyes and throat. Simple precautions can be taken with little trouble and at comparatively low cost. They include total enclosure of the process if possible, otherwise general ventilation, prevention of escape of the vapors, protective clothing, immediate washing when solvents come in contact with the skin, prohibition of smoking and open flames (whether the solvents are inflammable or not), prohibition of eating where solvents are present, and general care of health of the workers.
- 41 BENZENE NOTICE SHEET. Arbeitsschutz (German) 10, 236 (1937).
A "benzene notice sheet" has been prepared by the German Health Office for distribution to workers and foremen. It is probably similar to the pamphlets issued by the U.S. Division of Labor Standards, mentioned in our earlier Bulletins.
- 42 HEALTH INJURY IN PHOTOENGRAVING. J. Brachmann. Arch. f. Hyg., 118, 328-52 (1937) (German).
This paper deals with the use of benzene-xylene mixtures and their toxicity. The employees of 4 plants were examined. In the beginning of work with these mixtures headache, fatigue, irritability and other symptoms are common, but they usually disappear later. The color index of the blood is frequently over 1, and sometimes there is a notable decrease of leucocytes. The lymphocyte percentage is

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ical and toxicological studies of this substance have been in connection with its use as a hygroscopic agent in cigarettes but no conclusion has been reached on that point, and the effects of prolonged inhalation are unknown. Triethylene glycol has been little used in industry, and little is known about its effects. The studies on ethylene glycol monoethyl ether, known commercially as "cellosolve", have indicated that it has a similar toxicity to that of ethylene glycol. The same is true of the glycol ethers and ester-ethers, known under the trade names of butyl cellosolve, methyl carbitol, carbitol, butyl carbitol, methyl cellosolve, cellosolve acetate, and carbitol acetate. Such of those as have been investigated show toxic effects on animals in high concentrations, but the effect of low concentrations over long periods is unknown. All these substances should be used with caution until more information has been accumulated.

- 54 TOXICITY OF ORGANIC SILICON COMPOUNDS. I. TETRAETHYL-ORTHO-SILICATE. Joseph A. Kasper, Carey F. McCord and William G. Frederick. *Ind. Med.* **6**, 660-4 (Dec. 1937). Reprints or multigraphed copies may be obtained from Dr. McCord, Dept. of Health, Detroit, Mich.

Tetraethyl-ortho-silicate, generally known as ethyl silicate, is used industrially as a stone preservative and solvent. In experiments with 228 small animals (rabbits, guinea pigs and rats) the substance was administered intravenously, intraperitoneally, subcutaneously, intratracheally, orally, and to a limited extent through inhalation, alone and with suitable control substances, in different amounts and at various intervals. The minimum lethal dose, when injected intravenously into rabbits, is approximately 0.2 ml. per kilo of body weight: death usually occurs within one hour. The minimum lethal dose for rats, when administered intraperitoneally, is approximately 0.06 ml. per 100 grams of body weight: death usually takes place within 4 days.

Whatever method of introduction is used, the first action is mainly on the lungs, and consists of rupture of terminal capillaries, accompanied by pulmonary hemorrhage. This rupture may be noted within 10 minutes after peritoneal injection. In quickly fatal cases the heart was found greatly dilated, without material changes in the microscopic structure. In animals surviving the effects of the primary action of ethyl silicate, a definite acute nephritis may be demonstrated: hemolysis, hematuria and necroses of the tubular epithelium were also found.

"Although ethyl silicate possesses no proved physiologic properties of a type characteristic of the slow action of silica in producing silicosis, this organic substance, through animal experiments, displays a high degree of toxicity, acute in nature, and possibly related to the slow action of silica."

- 55 EFFECTS OF ALCOHOL ON WORKERS WITH CARBON DISULFIDE. J.A.N.A. (Queries and minor notes) **109**, 1472 (Oct. 30, 1937).

An inquiry was made regarding intolerance to alcohol among all workers in a chemical plant making rubber accelerators, where there is exposure to carbon disulfide. Even after a glass of beer, the men have rapid pulses, flushing of the face and hands, and fall in blood pressure. No other results of the exposure are noted. Skin tests and feeding experiments on mice were negative. The reply refers to the literature on carbon disulfide poisoning and suggests that "the alcohol may be regarded as a provocative agent demonstrating the actuality of carbon disulfide poisoning, minor in degree but possibly constituting much more of a threat in the well exposed workers than is implied in the query."

- 56 MEMORANDUM ON PRECAUTIONS IN THE HANDLING, STORAGE AND USE OF LIQUID CHLORINE. Factory Department, Home Office, Form 1868, H.M. Stationery Office, London (April 1937). Obtainable from British Library of Information, 270 Madison Ave. New York. This memorandum describes precautions to be used in handling cylinders of liquid chlorine and first aid treatment for cases of gassing. Liquid chlorine should be handled only by experienced persons. Cylinders and drums should be stored where

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they are protected from heat and danger of explosion, but where they are accessible in case of fire. Damage to valves, pipes and couplings should be avoided. When leakage occurs the point of leakage should be turned upward to avoid leakage of liquid. Mechanical devices for handling cylinders are given. Suitable respirators and oxygen breathing apparatus should be at hand. First-aid measures include stimulating expectorant mixture, hot poultices, venesection, tincture of opium, and pituitary extract, each to be used as the symptoms indicate.

- 57 STUDIES RELATING TO TOXICITY OF FLUORINE COMPOUNDS. C.A.Kempf, D.A.Greenwood and V.E.Nelson. J. Lab. & Clin. Med. 22, 1133-7 (August 1937). ^{sodium}
The authors found no effect from oral administration to dogs of fluoride in quantities up to 4.52 mg. of fluorine per kg. of body weight. Alpha-fluoronaphthalene produced mottled enamel of the teeth, but several other organo-fluorine compounds did not. The removal of fluorine from water by the use of aluminum sulfate is discussed.

- 58 INSTRUMENTAL METHODS OF AIR ANALYSIS DEVELOPED FOR INDUSTRY. Samuel Moskowitz, Ph. D., Division of Industrial Hygiene, N.Y.State Department of Labor, 80 Centre St., New York. Ind.Bull. 16, 502 (November 1937). Reprints obtainable at that address.
Several instruments for air examination, developed during the last few years, are described. They include a portable carbon monoxide indicator, a combustible gas indicator and a interferometer for comparing the refractive indices of two specimens of gas or liquid. Small, inexpensive devices for the estimation of other impurities in air are also available. They include hydrogen sulfide indicator, and one for carbon monoxide, smaller but less sensitive than the one first described.

- 59 MINE GASES AND THEIR EFFECTS. J.A.M.A. (Queries and minor notes) 109, 975 (September 18, 1937).
Gases occurring in mines are divided into natural ones and those caused by dynamiting and fires. Their effects are discussed briefly.

- 60 COLORIMETRIC DETERMINATION OF HYDROGEN SULFIDE IN AIR. K.A.Smirnov. Zavodskaya Lab. (Russian) 6, 240 (1937).
A method involving the use of sodium nitroprusside and arsenious sulfide is described. (An abstract in Chem. Abs. and in J. Ind. Hyg. gives details which may be sufficient for practical use.)

- 61 FATAL POISONING IN WELDING WITH ACETYLENE (DISSOUS GAS) Mawich. Arbeitsschutz 10, 239-42 (1937). (German).
One death and one case of illness occurred in workers who had been welding in a boiler. Technical experts blamed carbon monoxide, but the medical authority pronounced the death due to a lung irritating gas. Cases from the literature are cited, with decisions and discussion of other possibilities, especially that of a combined poisoning.

- 62 METALLIZING. Ztschr. f. Gewerbehyg. u. Unfall. 44, 141-2 (1937). (German).
A worker using acetylene in a zinc metallizing tank became very ill, with signs of liver injury and changes in the electrocardiogram. The gas was found to contain 0.17 mg. phosphine and 0.25 mg. hydrogen sulfide per liter. The liver changes are evidently caused by the phosphine.

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- 63 ACUTE CARBON MONOXIDE ASPHYXIA. F.F.Davis. Virginia Med. Month. 64, 337-9 (September 1937).
There are 50,000 cases of asphyxia annually, and half of them are estimated to be caused by carbon monoxide. The author feels that such cases should be treated by a physician and not left to safety squads of gas and electric companies. The recommended treatment consists of artificial respiration and administration of mixtures of oxygen and carbon dioxide. Injections and blood transfusions are probably useless. The value of methylene blue is questionable. Psychic disturbances sometimes result from carbon monoxide poisoning, but they are believed to be seldom permanent.
- 64 VALUE OF METHYLENE BLUE IN THE THERAPY OF CARBON MONOXIDE AND HYDROCYANIC ACID POISONING. Ztschr. f. Gewerbehyg. u. Unfall. 44, 102-8 (1937).
A review of the literature leads the author to doubt that methylene blue is an antidote for carbon monoxide poisoning; however, it has a favorable effect in cases of poisoning by hydrocyanic acid and cyanic compounds.
- 65 CYANIDE POISONING. Alfred P. Ingegno and Saverio Franco. Ind. Med. 6, 573-6 (November 1937).
Two cases of cyanide poisoning are reported and described, one from inhalation of hydrocyanic acid, the other following the ingestion of potassium cyanide. In both cases, intravenous injection of sodium nitrate and sodium thiosulfate after preliminary injection of coramine and caffeine in one case and ammonia and caffeine in the other, led to complete recovery. This method has been found successful in animal experiments. Occupational sources of cyanide poisoning, mode of action of cyanides, symptoms, identification of cyanide, details of treatment and references are included.
- 66 TOXIC EFFECTS OF CARBON DIOXIDE. Ralph M. Waters. New Orleans Med. & Surg. J., October 1937; Ind. Med. 6, 676-81 (Dec. 1937).
Carbon dioxide is not normally regarded as a poison, but a few persons are hypersensitive to it, and two cases are described as typical, in which carbon dioxide toxemia occurred in hospitals. In one case a mixture of carbon dioxide and oxygen was being administered; in the other the presence of carbon dioxide resulted from failure of absorption apparatus during an operation.
- 67 POISONING BY OXIDES OF NITROGEN. AN INVESTIGATION OF CASES AT THE RJUKAN SALT-PETRE FACTORIES. O.J.Broch. Norsk. Mag. f. Laegevidenskapen (Norwegian) 98, 370-97 (1937).
The gases studied were mainly nitric oxide and its oxidation product, nitrogen peroxide. Cases of poisoning occur only in the "solution department", where a small number of workers conduct the operation. They are highly paid, and their desire to continue at the high wage increases the possibility of ill effects. There were 19 workers examined, mostly with long experience, and 10 had been seriously gassed at least once. Permanent symptoms included dizziness, headache, vomiting, shortness of breath, decrease of endurance, and bad teeth; blood-stained expectoration occurred at intervals. Individual susceptibility differs; corpulent and heavily built workers suffering most. The author believes that masks would be little used if they were provided, on account of their weight, but is sure that available preventive measures would make cases of gassing very rare.
- 68 EFFECT OF AMMONIA ON MAN, AND PROTECTIVE MEASURES. H. Mueschenborn. Ztschr. f. Gewerbehyg. u. Unfall. 44, 122-5 (1937). (German).
The effects of ammonia are discussed, with reports of 2 accidents. The wearing of gas masks with a special filter is recommended in repair work where ammonia is likely to escape.

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- 69 DETERMINATION OF LEAD. D.M.Hubbard. J. Ind. Eng. Chem. Anal. Ed. 9, 493-5 (1937). The paper describes a photometric "mixed color" dithizone method for the determination of lead in certain biological materials. Three extractions are made, the first for the removal of extraneous salts, the second for the elimination of bismuth and the third for the final estimation of the lead, which is present in a state of high purity. Other metals usually found in biological material do not affect the results. The method is rapid, permitting complete analysis in a single day.
- 70 DETERMINATION OF LEAD IN BIOLOGICAL MATERIAL. J. Cholak. D.M.Hubbard, R.F.McNary and R.V.Story. J. Ind. Eng. Chem. Anal. Ed. 9, 488-90 (1937). The spectrographic, dithizone and chemical separatory (carbazine) methods for estimation of lead in biological materials were compared experimentally. The spectrographic and dithizone methods were found equally good where the quantity of lead exceeds 1 microgram, but the spectrographic method was found superior for smaller quantities. The chemical method is chiefly useful for large samples, in which a loss of approximately 0.07 mg., inherent in the method, is insignificant in either a chemical or physiological sense.
- 71 DITHIZONE, AN EXCELLENT REAGENT FOR LEAD. C.F.Miller. Chemist Analyst 26, 66 (1937). The preparation of the dithizone reagent from phenylhydrazine is described, as is also the method of conducting the test for lead by means of a 0.01% solution of the reagent in carbon tetrachloride.
- 72 METHODS OF PROTECTION IN THE MAKING OF BEARINGS OF BRONZE-LEAD ALLOY IN THE PRINCE HOHENZOLLERN FACTORY, LAUCHERTHAL. Glaser. Zentrbl. f. Gewerbehyg. u. Unfall. 24, 24 (1937). (German). The paper describes the methods of protection from lead fumes in a factory producing an alloy of copper and lead for bearings. Strong exhaust ventilation is provided over the furnaces and places where the alloy is poured out for casting, and those locations can be shut off from other rooms. The exposed men wear colloid masks, which are very efficient when proper attention is given them. Each mask is tested after putting on, by exposure to irritating gases; the resistance to respiration is regularly measured, and particular attention is paid to the outlet valve. Individual supervision and instruction of the workers form a part of the program.
- 73 BRASS POISONING. J.A.M... (Queries and minor notes) 109, 972 (Sept. 18, 1937). "Brass poisoning" is an anomalous term, because any chronic disease arising in brass manufacture is probably either lead or arsenic poisoning. Copper is comparatively harmless, but zinc may cause metal fume fever at the temperature at which it is generally mixed with copper. Proper protection involves ventilation and use of respirators. Exposure to zinc sulfate may give rise to a different and serious type of industrial poisoning.
- 74 TREATMENT OF ACUTE POISONING FROM MERCURY SALTS BY MEANS OF HYDROGEN SULFIDE (STRZYCZOWSKI ANTIDOTE). L. Mischoud. Schweiz. med. Wchschr. 67, 818-20 (1937) (German.) A case of sublimate poisoning was successfully treated by the use of this reagent. A severe nephritis which followed was quickly cured by the accompanying treatment of ingestion of alkalies, intravenous glucose ingestion and diathermy.

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- 79 MANGANESE. Industrial Data Sheet D. Chem. 26. National Safety Council. Nat. Safety News 36, 60. (Dec. 1937). Supplied to members of the National Safety Council at 5 cents, from its headquarters.

The hazards, symptoms, treatment and prevention of manganese poisoning are discussed briefly. The hazard arises from inhalation or swallowing of the dust. Manganese has its largest use as an alloy for steel and nickel, but is used also in dry battery manufacture, in coloring glass, enamels and cements, in the production of aniline dyes, and as a drier for varnishes and oils. Acute cases of manganese poisoning have never been reported, and all cases of chronic poisoning have been contracted through inhalation of dust or fumes containing oxides of manganese. Symptoms develop after 3 months and vary with the individual. They include languor, sleepiness, stolid appearance of the face, a low monotonous voice, muscular twitching, and cramps. There is no degeneration of tissue as in lead poisoning. The metal usually attacks a non-vital portion of the nerves and muscles but leaves the victim well otherwise. The best treatment in early stages is transfer to dust-free atmosphere; little can be done in advanced cases. Preventive measures include cleanliness, change of clothing, not eating in workrooms, regular examinations, and the use of respirators where the dust cannot be removed sufficiently.

- 80 TOXICITY OF SELENIUM. IV. EFFECTS OF EXPOSURE TO HYDROGEN SELENIDE. H.C.Dudley and J.W.Miller. U.S.Pub. Health Repts. 52, 1217-30. (Sept. 3, 1937) Obtainable from Supt. of Documents, Washington, D.C., for 5 cents, cash.

Guinea pigs were exposed to hydrogen selenide in concentrations ranging from 0.57 to 0.002 mg. per liter of air for single exposures of 10, 30 and 60 minutes. Ten minutes' exposure to the highest quantity was fatal to all animals in 5 days, and 40 minutes' exposure to the lowest was fatal in 25 days. The pathologic changes were fundamentally an early fatty metamorphosis of the liver and a later hypertrophy of the spleen. The apparatus is described in detail.

- 81 TOXICITY AND PATHOLOGY OF SELENIUM. M.I.Smith, E.F.Stohlman and R.D.Lillie. J. Pharm. Exp. Therap. 60, 449-71 (August 1937).

The acute and chronic effects of selenium poisoning was studied in animal experiments. About 50% of rats die when exposed to 3 mg. per kg. body weight, whether selenite or selenate is administered. Corresponding results were obtained with rabbits. However, the selenite is the more toxic when injected intravenously in rabbits.

- 82 ELIMINATION OF SELENIUM AND ITS DISTRIBUTION IN THE TISSUES. M.I.Smith, B.B. Westfall and E.F.Stohlman. U.S.Pub. Health Repts. 52, 1171-7 (August 27, 1937). Obtainable from Supt. of Documents, Washington, D.C., for 5 cents, cash.

Sodium selenite fed to cats was excreted in the urine to the extent of 50 to 80%, and up to 18% in the feces. The selenium is also widely distributed in the tissues, mostly in the liver, kidneys, spleen, pancreas, heart and lungs.

- 83 DESIGN OF PAINT SPRAYING AND SANDBLASTING NOZZLES. Freudenthal. Zntribl. f. Gewerbehyg. u. Unfall. 24, 203-6 (1937) (German).

The author shows how dust prevention can be secured by proper arrangement of the spraying nozzle, including widening, flattening, beveling and admission of air. The design is illustrated.

- 84 REPORT ON THE ACTIVITY OF THE TECHNICAL INSPECTION OFFICE IN 1936. Chemical Industry Association. Chem. Ind. (German) 60, supplement issued with Aug. 14 number, 1-56 (1937).

This is an extensive report on many cases of accidents and several industrial diseases. Among the latter were 2 fatal cases of dinitrocresol poisoning, 2 cases of hydrogen sulfide poisoning, several of carbon monoxide poisoning and 2 fatal cases of Weil's disease in workers who took care of rats in a biochemistry laboratory.

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References to Recent Literature - 19

- 85 ELECTRIC ARC WELDING. J.A.M.A. (Queries and minor notes) 109, 975 (Sept. 18, 1937).
Two hundred feet from a welding place is considered as a safe distance for spectators and other workers not wearing goggles.
- 86 OCCUPATIONAL DISEASES AND INJURIES OF THE EYES AND WORKMEN'S COMPENSATION. M. Gardner. Med. J. Australia 2 732-3 (October 23, 1937).
The author discusses the 666 cases of occupational diseases and injury of the eyes, which he has observed in 5 years (in Australia). There were 324 cases of corneal lesions, including 230 caused by foreign bodies, and many from burns. A rough method for estimating percentage loss of vision is presented. In the discussion a simple table of suggested percentage incapacity ratings for different visual acuities of the affected eye is listed, in place of the present (Australian) system of compensation of eye injuries.
- 87 SALT TABLETS FOR HEAT - POSSIBLE OVERDOSE. J.A.M.A. (Queries and minor notes) 109, 972 (Sept. 18, 1937).
The question is raised as to whether there is danger of overdosage of salt tablets in cases of arteriosclerosis or nephritis with potential edema. The reply is that the use of 5 to 10 tablets daily does not exceed the replacement basis in hot industries or during hot weather, and should cause no ill effects.
- 88 LOSS OF MINERALS THROUGH THE SKIN OF NORMAL HUMANS WHEN SWEATING IS AVOIDED. R.H. Freyberg and R.L.Grant. J. Clin. Invest. 16, 729-31 (Sept. 1937).
The loss of certain inorganic elements through the skin of two healthy men was investigated, with precautions to prevent sweating. No calcium or phosphorus was found. The 24 hour eliminations of sodium, calcium, chloride and sulfate sulfur were found to be large enough to be of importance in the accurate determination of the exchange of these elements as commonly done in mineral "balance" studies, and corrections should be made in those studies for losses through the skin.
- 89 AFTER-CARE AND RE-EMPLOYMENT OF THE TUBERCULOUS PATIENT. E.L.Sandiland. J. Roy. Inst. Pub. Health and Hyg. 1, 46-56 (Oct., 1937).
Attempts to find employment for men disabled by tuberculosis in Great Britain have been made in three directions: (1) the establishment of workshops in the outside world under After-Care Committees or Local Authorities; (2) employment of ex-patients on the staffs of sanatoria, and (3) the establishment of village settlements, with industries attached. The first plan has not been very successful, mainly on account of lack of financial help. The author concludes that settlements constitute one of the most economical methods of dealing with certain types of the tuberculous population.
- 90 INDUSTRIAL CANCER WITH SPECIAL REFERENCE TO ITS PREVENTION AND ACCIDENT LEGISLATION. O. Teuschlaender. Med. Welt (German) 11, 1267-72 (1937).
The paper is a critical review and general discussion of industrial cancer, including the industries concerned, the active agents and the localizations observed. In most cases it is impossible to render the injury harmless or neutralize its carcinogenicity; all that remains is to diminish the exposure. Cleanliness, medical supervision and change of work are suggested; compensation problems are discussed.
- 91 SKIN IRRITATION AND CANCER IN THE UNITED STATES NAVY. S. Peller and C.S.Stephenson. Am. J. Med. Sci. 194, 326 (Sept. 1937).
The prolonged exposure to the sun's rays, open air and salt water, to which Navy men are subjected, is associated with a frequency of cancer of the lip and skin 8 times the normal and a greatly diminished morbidity and mortality from all other cancers. In about four-tenths of the men who would be expected to die from an inner malignant manifestation there developed instead a curable tumor of the lip and skin. The mortality from cancer of the skin and lip is about 3

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times higher in the Navy than in the average population of the same age group. Apparently a tumor in the inner organs develops later in only a small part of the patients in whom cancer of the lip and skin has been cured. This problem must be studied on a large scale, as this situation suggests a possible preventive treatment.

Statistics of incidence of the forms of cancer considered are included.

- 92 CHEMOTHERAPY OF BLADDER CARCINOMAS WITH AMINO BODIES. Henschen. Arch. f. klin. Chir. 189, 19-20 (1937). (German).

Bladder cancer has been produced in rabbits by the inhalation of naphthylamine vapor. Experiments by Schaer on resorption and excretion by the bladder in an aniline worker showed that there are several ways in which naphthylamine can come in contact with bladder tissue, from the general circulation and through the bladder vessels. Precancerous and warning stages are local hyperemias, cystitis cystica, and subepithelial hemorrhages. The possibility of anticancerous action of some aromatic amido compounds, administered orally, is being studied.

- 93 TURPENTINE ECZEMA IN SWEDISH PAINTERS. AN OCCUPATIONAL DISEASE INVESTIGATION. G. Rundberg. Hygiea (Swedish) 99, 209-49 (1937).

A paper on the chemical aspects of this subject was abstracted in our last bulletin (Abst. no. 690). This paper deals with results of occupational exposure. The author conducted inquiries among 450 painters in Stockholm and carried out skin sensitization tests with French turpentine, Swedish sulfate turpentine, Swedish charcoal turpentine and a petroleum derivative sold as dilutin. It was found that 110 of the painters suffered from eczema, and 56 others showed changes that may in some cases be preliminary symptoms of eczema. Various general symptoms were found in many cases. Both the clinical examinations and the skin tests suggested that the Swedish preparations were more to blame than the French. The producers of Swedish turpentine have undertaken to revise their chemical processes so as to eliminate or reduce the impurities.

- 94 EFFECTIVENESS OF SOME PROTECTIVE AGENTS AGAINST ECZEMA. I. LUPOCID AND BOROLAN. K. Finkenrath. Zntribl. f. Gewerbehyg. u. Unfall. (German) 24, 206-8 (1937).

Lupocid salve and borolan (apparently proprietary remedies that are on the German market at least) were found to fall short of the claims made by their makers. The former has an irritating effect on the skin and the latter does not prevent an occurrence of eczema.

- 95 LEAF OF ALOE VERA IN TREATMENT OF ROENTGEN RAY ULCERS. REPORT OF TWO ADDITIONAL CASES. A.B. Loveman. Arch. Dermatol. & Syphil. 36, 838-43 (Oct. 1937).

The author reports success in the treatment of Roentgen ray ulcers with leaves of aloe vera, but only after a long period, definite signs of improvement appearing after 5 weeks. He attributes the slow healing to the fact that only certain parts of the ulcer are capable of regenerating the epithelium. The whole leaf was found to be much more efficacious than the ointment.

- 96 DERMATITIS ACTINICA DUE TO ROENTGEN RAY TREATED WITH THE LEAF OF ALOE VERA. H. Fox. Arch. Dermatol. & Syphil. (Society transactions) 36, 891-2 (Oct. 1937).

The author and several others obtained no success with the aloe vera treatment. In the author's case it was discontinued after 2 weeks on account of the pain. In view of the results in the preceding abstract, it is possible that the treatment was not continued long enough.

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- 97 PROTECTION OF THE SKIN AGAINST LIME. G. C. Pether. Brit. Med. J. 2, 792-3 (October 9, 1937).

Exposure to burnt lime injures the skin and eyes. Respirators for the nose and goggles for the eyes are worn by workers in lime kilns, but the question of skin protection remains. Some men, but not all, acquire a tolerance to the dust. The skin becomes dry and hardened, and severe ulcers may follow. Washing gives no protection, but talc dust shaken over the skin, lessens sweating and forms a protective film. It is also of value as a dressing for ulcers. Strips of lint worn under the collar protect the skin of the neck from abrasion.

We received the following information on reprints too late to insert it in the headings:

No. 8. (DUST HAZARD IN FOUNDRYMEN) is obtainable from the author, Dr. Leslie H. Osmond, St. Francis Hospital, Pittsburgh, Pa.

ABSTRACT #53 was omitted in its regular turn, and is given below:

- 53 TOXICITY OF MATERIALS USED IN LINING BEER CANS. J.A.M.A. (Queries and minor notes) 109, 891 (Sept. 11, 1937).

The toxicity of chemicals used in lining beer cans is discussed, in reply to the report of a case of secondary anemia in a man engaged in that work. The solvents are methyl-ethyl-ketone, known as "MEK" and LAC X21B, probably a vinylid synthetic resin. References are given, and no definite conclusion is stated, except that the substances mentioned are not generally considered very toxic.

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- 75 A STUDY OF CHRONIC MERCURIALISM IN THE HATTERS' FUR CUTTING INDUSTRY. P.A. Neal, R.R. Jones, J.J. Bloomfield, J.M. DallaValle and T.I. Edwards. U.S. Pub. Health Bull. no. 234 (May, 1937). Obtainable from Supt. of Documents, Washington, D.C. 15 cents, cash.

A survey was made of all fur cutting factories operating between February and May 1935, 36 in number, including physical examinations of 529 men and women, constituting 26.4% of the fur cutters in the United States. The plants are larger than in the average industry but the provision of medical care is more limited. Estimations of mercury vapor in the air and dust counts in 5 factories showed from a trace to 1.04 mg. mercury as vapor and dust per cubic meter of air. The workers most exposed are shippers, followed by pilers, blowers, cutters and sorters. Carroters who apply the mercuric nitrate to the pelts are not exposed to mercury vapors. The amount of dust is not high enough to be injurious.

Forty-three of the workers were found to be suffering from chronic mercurialism, but there may have been subclinical cases not included. Psychotic and neurotic symptoms and those of digestive disturbance increase with increasing quantities of mercury in the air. Psychic disturbances and fine intention tremor present in 34 out of 43 cutters, are much higher in incidence than in other industries investigated by the Public Health Service.

The picture of chronic mercurialism corresponds to the classical one in all important respects. Slight salivation was found in only 10, all of whom had worked in high concentrations (0.25 mg. per cu. m.) of air. The incidence of other diseases is not high. Practical suggestions include the use of local exhausts and segregation of occupations not involving exposure to mercury.

- 76 DETECTION OF SMALL QUANTITIES OF MERCURY IN AIR. K. Grosskopf. Draegerheft. No. 19, 3589-91 (1937). (German).

A sampling tube for mercury has been developed by the Draeger firm in connection with its apparatus for determining traces of gas. Gold chloride is fixed on pure silica gel, which is then dried in vacuo at high temperatures, activated and put into the test tube. On drawing air through the tube after preliminary washing, a sharply defined ring of colloidal gold with definite color variations is seen in the tube. With increasing amounts of mercury the color of the ring deepens, then the zone of reduction widens, and an approximate quantitative estimation may be made with the aid of comparison tubes. A concentration of 0.001 mg. per liter of air may be detected.

- 77 THE TOXICITY OF ORALLY INGESTED ARSENIC, SELENIUM, TELLURIUM, VANADIUM AND MOLYBDENUM. K.W. Franke and A.L. Moxon. J. Pharm. Exp. Therap. 61, 89-102 (Sept. 1937).
Salts of the acids of these elements were fed albino rats at levels of 25 and 50 p.p.m. of the elements in their diets. Toxicity was determined by effect on growth, food consumption, mortality and hematopoietic system of the animals, and the results are presented in charts and tables. The relative toxicities in increasing order are as follows: arsenic, molybdenum, tellurium, vanadium, and selenium. At the 50 p.p.m. level selenium was very toxic, tellurium and vanadium moderately so, and the other two slightly toxic. Selenium was the only one that caused a distinct disturbance of the hematopoietic system. Tellurium caused loss of hair.

- 78 TOXICITY OF GREEN ROUGE OR CHROME GREEN. J.A.M.A. (Queries and minor notes) 129, 813 (Sept. 4, 1937).

The inquiry concerns the toxicity of the above substances which are used in polishing and coloring electrical fixtures. Green rouge is chromic oxide, quite widely used as an abrasive. Its use may lead to "chrome holes." Chromic acids, its salts and chromium oxides attack unbroken skin, and nasal perforation or inflammation may be caused by inhalation of the dust of the oxide.

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usually increased. The number of granulocytes was usually found below normal. An industrial disease is undoubtedly present when the neutrophilic granulocytic count is below 2000 and the total leucocytic count is below 4000, even with fair general condition* However, there is great variation in the ratio of blood findings and symptoms; if the symptoms are severe with no marked blood changes, industrial disease must be considered present. In plants where benzene is used instead of benzene and xylene, the workers' health was much better than in the others, and the use of benzene should be encouraged. Ventilation and local exhaust systems should be provided. *(and slight subjective symptoms).

- 43 X KETENE AS A NOXIOUS GAS. G.R.Cameron and A.Neuberger. J. Path. Bact. 45, 653-60 (November 1937). X

The toxicity of ketene has been suspected, but not previously fully investigated. In concentrations of less than 100 parts per million, ketene was proved fatal to mice. It resembles phosgene in its mode of action, which is mainly in the alveolar and capillary tissues. Gas masks with canisters containing soda lime give efficient protection.

- 44 EXPOSURE TO TRICHLOROETHYLENE, Ind. Bull. 16, 437-8 (Nov. 1937). Obtainable from Division of Industrial Hygiene, N.Y. State Dept. of Labor, 80 Centre St., New York, N.Y.

The Division of Industrial Hygiene is undertaking an extensive investigation of possible toxic effects of exposure to trichloroethylene, and this paper is a preliminary review of the present status of the subject. The work of von Ottingen (our abstract no. 563) and the earlier work of Stuber are reviewed briefly. An assiduous search of American literature has failed to reveal a single case of industrial poisoning due to trichloroethylene; whether this is due to unreported cases or to actual absence of cases, we do not know. It is suggested that the discrepancy between this lack of cases and the number reported in Europe is due to the greater stability of the American product, which point is being investigated. Three cases of workers under exposure to trichloroethylene are being studied. A list of their symptoms is presented, but the symptoms do not as yet offer a definite conclusion as to whether they are the result of exposure. A full report of these cases and other findings will appear when the investigations are completed.

- 45 CLASSIFICATION OF TRICHLOROETHYLENE. M. Trillat. Ann. d. Hyg. pub. 15, 434-41 (1937). (French).

The author states that the belief that trichloroethylene is dangerous is ungrounded so far as the present product is concerned. No case of acute poisoning has appeared since 1930, and earlier cases were due to the impure product. Quoting from the Conseil d' Hygiene, he says: "The listing of trichloroethylene with hazardous substances thus is unjustified." (The abstractor objects to this conclusion on the ground that the chronic effect is disregarded and that there are many recent reported cases of acute poisoning. A fair estimate of the toxicity of trichloroethylene can be obtained from the preceding abstract, also no. 652 in December Bulletin and the original paper of no. 563, in the November Bulletin.)

- 46 HEALTH HAZARDS IN THE USE OF CARBON TETRACHLORIDE. G.W.Daubenspeck. Ill. Med. J. 72, 274-5 (Sept. 1937). +

The industrial uses of carbon tetrachloride are listed and symptoms of acute poisoning are given. For constant exposure, 100 parts per million is considered the maximum safe concentration. Its decomposition products (phosgene, and hydrogen chloride especially) are very toxic and contact with an open flame in a closed room should be avoided. Carbon tetrachloride should be handled only in closed systems or under forced draft, and special precautions must be taken when other substances like chlorinated waxes, alcohol, etc., are also used.

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References to Recent Literature - 12

- 47 TOXICITY OF HALOWAX AND CHLORINATED NAPHTHALENES. J.A.M.A. (Queries and minor notes) 109, 1386 (Oct. 23, 1937).
The inquirer reports that all workers exposed to halowax in a plant have developed an acne, in spite of protective measures. The face and arms are chiefly attacked. The reply refers to Special Bulletin No. 43 of the Pennsylvania Department of Labor and Industry (obtainable on application to that Department), but deals especially with the systemic effects.
- 48 GLYCERIN, ETHYLENE GLYCOL, PROPYLENE GLYCOL AND DIETHYLENE GLYCOL. H.G.O.Holck J.A.M.A. 109, 1517-20 (Nov. 6, 1937).
On account of the substitution of diethylene glycol for glycerin as a hygroscopic agent, the toxicity of the 2 substances was studied in feeding experiments on rats. High concentrations of glycerin appear harmless, but 5% of diethylene glycol was found distinctly injurious, judging by mortality, stunted growth and impaired reproductive capacity. When administered in water it was even more toxic 0.25% in water seemed to hinder growth.
- 49 RENAL LESIONS DUE TO DIETHYLENE GLYCOL. H.D.Kesten, M.G.Mulinos and L. Pomerantz J.A.M.A. 109, 1509-11 (Nov. 6, 1937).
Diethylene glycol administered orally to rats and intravenously to rabbits caused extensive injury to the epithelium of the renal convoluted tubules, leading to urinary obstruction and uremia. The liver and adrenals were less regularly involved. Three per cent diethylene glycol in the drinking water killed about half of the rats in 2 months. Other details are given.
- 50 PROPYLENE GLYCOL: RATE OF METABOLISM, ABSORPTION AND EXCRETION, WITH METHOD FOR ESTIMATION IN BODY FLUIDS. A.J.Lehman and H.W.Newman. J. Pharmacol. & Exp. Therap. 60, 312-22 (July 1937).
An experimental study of the effects of injected and ingested propylene glycol on animals showed that in intravenous injection, the acute toxicity was less than half that of ethyl alcohol, and the narcotic action about one-third as great. It is estimated in body fluids by oxidation with sodium periodate after precipitation of glucose by barium hydroxide in alcoholic solution.
- 51 THE GLYCOLS AND THEIR DERIVATIVES. L.J.Goldwater, Div. of Industrial Hygiene, N.Y.State Dept. of Labor, 80 Center St., New York. Ind. Bull. 16, 308-9 (Aug. 1937). Reprints obtainable at above address.
The Division of Industrial Hygiene is making a study of some of the glycols and their derivatives, which are becoming more widely used in industry. In a brief review of the literature, the author states that no cases of industrial poisoning from ethylene glycol have been reported, but urges reasonable precaution in handling glycol until further observations have freed the substance from any suspicion of toxicity under industrial conditions.
- 52 THE GLYCOLS AND THEIR DERIVATIVES. II and III. Leonard J. Goldwater. Ind. Bull. 16, 438-9 (Nov. 1937) and 504-5 (Dec. 1937). Reprints obtainable as per preceding abstract.
The review of the literature on glycols and derivatives is extended to consideration of propylene glycol, diethylene glycol, triethylene glycol, "cellosolve" and other ethers, and glycol esters. Industrial poisoning due to propylene glycol has not as yet been reported. The animal experiments that have been made (including abstract 50) indicate a relatively low toxicity, but the results so far obtained cannot be interpreted in terms of industrial exposure. Diethylene glycol has been given publicity as a result of fatalities resulting from its use as a solvent, and such an occurrence should warn all who contemplate using newly developed substances for any purpose whatsoever. Nearly all of the pharmacolog-

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