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Industrial Health News



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exposure 12%, in 1-10 years 36%, and in over 10 years 79%. Five cases of pulmonary tuberculosis were noted. The clinical histories of these are recorded.

- 79 Correlation of Disability with Roentgen and Clinical Findings in Silicosis. Part 1 Paul Howard. Radiology, 41, 11-12 (July, 1943).

Disability in industrial lung disease cannot be accurately estimated by roentgen examination alone. Uncomplicated silicosis may be associated with moderate fibrotic changes and a considerable degree of disability, whereas in other cases massive lesions may produce only a slight decrease in capacity for work. A considerable part of the dyspnea in silicotics is due to fibrosis of the alveolus itself and not to the nodular fibrosis. When roentgen evidence of superimposed infection is present, disability should be anticipated; if there is roentgen evidence of a superimposed active pulmonary tuberculosis, it may be stated with confidence that disability is total and permanent. In absence of cavitation, diagnosis of tuberculosis in advanced silicosis is difficult, and should only be made when there is laboratory confirmation.

- 80 Correlation of Disability with Roentgen and Clinical Findings in Silicosis. Part 2. J.E.G. Hannon. Radiology, 41, 13-17 (July, 1943).

Silica, by reason of its solubility, reacts to form silicic acid, which causes specific changes in monocyctic cells. First, dust laden cells in the lymphatic channels elongate and reticulum appears in the intercellular spaces. Second, the cells elongate further and assume fibroblast shape and arrange themselves in concentric nodules. Third, the cells lose their nuclei, and the nodule becomes fibrous and undergoes hyaline degeneration. The degree of dysfunction of the lungs is not proportional to the change revealed by X-ray. Inhalation of silicon dioxide dust frequently decreases pulmonary function before the shadows of the silicotic nodule become visible on X-ray film. Disability is not primarily due to nodular fibrosis, but is caused by the thickening of the alveolar walls and associated emphysema with decreased elasticity of the lungs and interference with normal bronchioles and engorgement of the capillaries are added factors in disability. The degree of lung dysfunction in pulmonary fibrosis is best measured by respiratory function tests outlined in the article. A person with respiratory disability can increase his depth of breathing only to a very limited extent. When he requires more air, he is compelled to increase his respiratory rate.

- 81 Cancer in Relation to Occupation and Environment. W.C. Hueper. Bull. Am. Soc. Control Cancer, 25, (June, 1943).

Among the chemical and physical agents causing occupational cancer are heavy metals, nitrates, aromatic amino compounds, benzol, asbestos, mineral oil, soot, radioactive substances, ultraviolet radiation and X-rays. A recent addition to the list is coal tar, which may cause cancer of the urinary tract, most frequently in the aniline dye and related industries. The following suggestions are made to aid in prevention and control of occupational cancer: (1) An occupational history of every case of cancer; (2) Experimental investigation of the carcinogenic properties of substances now in industrial use; (3) State inspection of industrial plants; (4) Technical improvement in production methods to eliminate hazards, and the use of substitutes for substances known to be carcinogenic.

Methods of Detection and Determination

- 82 Simple Device for Preparing Vapor-Air Mixtures. Ind. & Eng. Chem., Anal. Ed., 15, 562 (1943).

A device is described by which the amount of chlorinated solvent aspirated through a combustion apparatus can be determined by successive precise weighings.

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- 602 DANGEROUS GASES IN DISTILLATION AND REFINING PROCESSES. E. LeQ. Herbert. J. Inst. Petroleum, 25, 323-46 (June 1939). (British).

In distillation processes the most dangerous gas encountered is hydrogen sulphide, although the hydrocarbon petroleum gases are also present in considerable concentrations. The physiological effects of both types are reviewed together with methods of protection against each. Hydrocarbon vapors such as gasoline can be significant physiologically at slightly lower concentrations than the lower limit of inflammability (1.45% by volume). In refining processes a number of gases are encountered, depending upon the method of treatment used. Sulphur dioxide is almost universally present in all plants as are chlorine, ammonia and a few organic sulphur compounds. In the solvent-extraction processes still further vapors are met with, including furfural, phenol, chlorox, nitro-benzene, benzene, acetone, methyl ethyl ketone, cresol and propane. The effects of these vapors are reviewed and concentrations that are dangerous are given, but no mention is made of the magnitude of the concentrations that are likely to be encountered within the plants. A number of tables in the paper lists the properties of each gas, toxicities at various concentrations, limits of inflammability, and methods of protection against each.

- 603 THE DETECTION OF GAS IN THE FIELD AND REFINERY IN IRAN. Anglo-Iranian Oil Co., J. Inst. Petroleum, 25, 356-8 (June 1939). (British).

The detection of inflammable gases, since 1938, has been done with two similar commercial detectors based on the temperature increase of a platinum wire as the air is passed over it. Regarding hydrogen sulphide it is the practice to assume that when all inflammable gases have been washed out of a tank it can also be considered that no appreciable amount of hydrogen sulphide is present and its detection is then omitted. When hydrogen sulphide tests are made, one of two methods is followed: the first measures the extent of blackening of a mercury salt on granulated pumice in a glass tube; the other, the darkness of a stain on a paper impregnated with lead acetate. Both methods are capable of measuring dangerous concentrations with certainty. For sulphur dioxide determination the method of drawing air through paper impregnated with a starch iodine solution is used. The methods used on other gases are not included.

- 604 THE PHYSIOLOGICAL EFFECTS OF TOXIC GASES AND VAPORS. T. McClurkin. J. Inst. Petroleum, 25, 392-91 (June 1939). (British).

In the first part of the paper the physiological effects of gases and vapors which are likely to be met with in the petroleum industry are considered. The second part deals with a group of other toxic gases. All are reviews taken from the literature. Those gases covered in part one are: hydrogen sulphide, sulphur dioxide, chlorine, carbon monoxide, petroleum spirit and benzene, acetone, benzene, mercaptan vapors, furfuraldehyde and phenol. Part two gases are: hydrogen cyanide, carbon disulphide, aniline and organic halogens. A brief description is given of each.

- 605 THE DETECTION OF TOXIC GASES IN INDUSTRY. R. B. Vallender. J. Inst. Petroleum, 25, 392-403 (June 1939). (British).

Numerous cases of poisonings are cited to show the need for the determination of potentially hazardous concentrations of gases in industry. The methods, to be practical, should be simple, rapid and sensitive to low concentrations. Most methods fall into one of three classes: (1) physical or physico-chemical methods, (2) adaptations of ordinary chemical methods and (3) colorimetric or nephelometric methods. Rapid methods based on the third class are probably the most practical and useful in these types of analyses, and a number of simple tests are described.

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- 606 PROTECTION AGAINST DANGEROUS GASES IN THE OPERATION OF CRACKING PLANTS. E.J.M. Tait. J. Inst. Petroleum, 25, 347-55 (June 1939). (British).
Precautionary rules for the prevention of gassing accidents are discussed briefly. The types of gas mask protection and locations where their use is essential are described. Special attention should be given to entering locations where hydrocarbon gases may accumulate, as in pump-houses, trenches, sumps, etc. Many accidents occur among men accustomed to their work and who have become careless following low-accident periods so that continual safety instruction is essential.
- 607 TOXIC ORGANIC SOLVENTS. K. Tomlinson. Paint Manufacture, 9, 140-2 (1939). (British).
All solvents other than water are regarded as toxic to some degree, and to treat a solvent casually and carelessly is inviting disaster even if it has been used with safety for several years. Transient and cumulative poisoning are discussed briefly. The aromatic hydrocarbons and the chlorinated hydrocarbons are the most toxic of ordinary solvents.
- 608 TOXICITY OF MOTOR FUELS AND EXHAUST GASES. G. Castrovilli. Rass. med. ind., 10, 1-16 (1939). (Italian).
A review of benzene, carbon monoxide and naphtha poisoning from the exhaust gases of motor vehicles is followed by an analysis, in tabular form, of exhaust gases obtained by the use of methane and naphtha in wood-gas-and-gasoline-driven engines. A list of the symptoms indicating poisoning from naphtha and wood-gas-driven engines is given. The toxicity of natural methane was found to be much less than that of the others mentioned.
- 609 CARBON MONOXIDE IN UNDERGROUND ATMOSPHERES. THE ROLE OF BACTERIA IN ITS ELIMINATION. G. W. Jones and G. S. Scott. Ind. Eng. Chem., 31, 775-8 (1939).
It has been found that certain types of microorganisms present in anthracite waters will readily consume hydrogen and carbon monoxide from gaseous mixtures. In laboratory experiments, a sample containing 4.1% hydrogen and 11.6% carbon monoxide was entirely depleted of the former in 10 days and of the latter in 50 days. A blank containing bacteriostatic solution had no effect even after 50 days. Hydrogen is oxidized to water and carbon monoxide to the dioxide; no methane is formed. It is concluded that it is not safe to assume that fires have been extinguished in sealed fire areas because of an absence of carbon monoxide in those areas.
- 610 EFFECTS ON ANIMALS OF PROLONGED EXPOSURE TO SULPHUR DIOXIDE. F. R. Woodon, Albert Hartzell and Carl Sotterstrom. Contrib. Boyce Thompson Inst. 10, 281-323 (April-June 1939).
Despite the prevalence of sulphur dioxide as an atmospheric contaminant, industrially and otherwise, there is a lack of positive experimental work on its action on human beings over a wide range of concentrations. The present paper describes an extensive series of experiments, probably the most important recent work on the subject. Hundreds of white mice and guinea pigs were used in the tests, and the effects of the gas on invertebrates (grasshoppers and cockroaches) were also determined. In general, the resistance to the gas was greater than expected and signs of distress were less. No significant mortality or signs of distress occurred among healthy animals at concentrations of 33 p.p.m. or below. Gross appearance post mortem of these animals did not differ greatly from those of control animals. Above this concentration changes begin to appear, notably: the cornea becomes opaque, the stomach becomes distended and congestion of the viscera more definite. However, the fact that guinea pigs withstood 150 p.p.m. for considerable periods of time when exposed for only eight hours per day suggests that no direct toxic effects result to industrial workers exposed

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occasionally to concentrations of this magnitude. Excellent discussions are given of the probable action of the gas, taken not only from the results of these tests but also from the literature.

- 611 THE SELENIUM PROBLEM AND ITS RELATION TO PUBLIC HEALTH. Q. A. Manville. Am. J. Pub. Health, 29, 709-18 (July 1939).

The paper is a review of the literature of some 79 items on selenium and its toxicity in the body. It deals largely with the action of the substance when ingested with foods but considerable knowledge of its action regardless of mode of entry may be gained from the material presented. The element is present in the soils in certain areas in the West and in Mexico and is no doubt the toxic factor in the condition known as "alkali disease", prominent in affected areas. Selenium is present in all plants and foods grown in seleniferous soils and while the public health aspect of the problem is limited to those affected areas it should not be overlooked that most of the world's wheat is grown in seleniferous soils and also that the use of selenium in all food sprays is increasing. Industrially selenium exposure may occur in industries extracting and processing ores containing the substance or in industries using selenium compounds as basic materials for manufacturing purposes. It may be absorbed by inhalation, through the skin or by ingestion depending upon the state of the compound. Authorities are cautious in stating its toxicity but it is certain that repeated absorptions of small amounts have a marked detrimental effect on the body.

- 612 LEAD HAZARD AT SOLDERING BENCHES. Thec. Hatch. Industrial Bulletin, New York Dept. of Labor, 16, 284 (June 1939).

The lead hazard, during miscellaneous soldering operations on small tanks and the like by men engaged full time on this work, is two-fold: (1) lead oxide fume may be given off during soldering and (2) lead dust and cuttings are released by filing, grinding and sanding. While most of the latter dust may be particles too coarse to be breathed, these particles if not properly handled will be ground underfoot, etc., and the dangerous dust disseminated into the room. An exhaust system is described for a ventilated soldering bench. The top of the bench is an open grille through which the filings fall to a hopper and pan below. An exhaust below the grille removes all very fine dust. An exhaust is placed over the soldering-iron stove to remove lead fumes. A raised floor grid in front of the table minimizes the grinding of lead underfoot.

- 613 THE TOXICITY OF OCTYL ALCOHOL. J. Am. Med. Assoc. (Queries & Minor Notes) 112, 2353 (June 3, 1939).

Octyl alcohol lately has come into extensive industrial use. Some of the applications are the following: anti-foaming agent, dehydration of lubricating oils, the printing of textiles, manufacture of paper, air conditioning sprays, and other applications. Little is known of its true properties, but its extensive use with no serious consequences leads one to believe that its toxicity is of a low order. The disagreeable odor may have the effect of a deterrent in its use.

- 614 THE EFFECTS OF ETHYLENE DICHLORIDE VAPORS. J. Am. Med. Assoc. (Queries & Minor Notes) 113, 167 (July 8, 1939).

Ethylene dichloride is now classified as of the same order of toxicity as trichlorethylene. The symptoms of its toxic action are, in addition to nausea and vomiting, irritation of nose and eyes, dizziness, ataxia, fatty degeneration of the liver, nephritis and perivascular hemorrhages of the brain. No chronic symptoms arising from prolonged exposures have been reported.

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- 615 TOXICITY OF ETHYLENE AND PROPYLENE GLYCOLS. M. Aiazzi Mancini. Boll. soc. ital. biol. sper. 14, 68-71 (1939). (Italian).
Ethylene glycol caused no ill effects in doses of 0.70 to several cc. daily; doses of 10-15 cc. produced oxaluria and 40-50 cc. caused death or severe intoxication in rats. Propylene glycol was much less toxic.
- 616 CARBON DISULFIDE POISONING. S. Sarai. Z. klin Path. Hamatol. 5, 795 (1936). (Japanese).
The amounts of hydrogen sulfide, sulfur dioxide and carbon disulfide in the air of two factories were determined. Symptoms produced by the gases are described. Eight patients with mental symptoms due to carbon disulfide mostly showed symptoms of dementia praecox and of manic-depressive insanity. Recovery followed in 10 days to 1-2 months after removal from exposure. One patient showed neurasthenic symptoms for months. The changes in red and white blood cells are detailed.
- 617 PULMONARY INJURY BY MANGANESE DUST. K. W. Jotten. Deutsch med. Wschr. 65, 409-10 (1939). (German).
Of 32 rabbits inhaling manganese dioxide dust for 1 hour every day, nine died within 3 weeks from extensive broncho-pneumonia. Animals which had been exposed to manganese showed a higher mortality rate from experimental pneumococcal infection than controls. Injection of manganese dioxide particles into the abdominal cavity produced severe haemorrhagic peritonitis.
- 618 CANCER AS AN ACCIDENTAL INJURY UNDER THE WORKMEN'S COMPENSATION ACT. I. H. Rubenstein and M. S. Levy. Ind. Med. 8, 284-6 (July 1939).
Despite the fact that medical science is not at all certain of the actual cause or causes of cancer, the law, as to whether cancer is an "accidental injury" under the several workmen's compensation acts, seems well settled. Cases involving cancer may be divided into two classes: (1) where the injury is known to have brought about a cancer, and (2) where injury aggravated and accelerated a pre-existing cancer. The essential difference is the existence or not of a cancer prior to occupational injury. Cases of both types are described in which compensation has been allowed or denied for either type, depending upon the apparent evidence as to real occupational cause or effect.
- 619 OCCUPATIONAL MELANOSIS FROM PITCH. H. R. Foerster and L. Schwartz. Arch. Dermat. and Syphilol., 39, 955-68 (June 1939).
The authors have previously reported (Abstract No. 493, 1939) that pitch dermatitis and melanosis are true reactions of photosensitization resulting from the local exogenous activity of a specific photosensitizer in pitch, activated by specific spectral bands of light. In this paper, case reports are presented of workers exposed to pitch and tar. Dermatitis and melanosis are important occupational hazards in coal tar and pitch industries. Most workmen exposed to the hazard have dermatitis or melanosis (pigmentation) though some may not be affected and variations in susceptibility exist. Histologic studies indicate that the discolorization due to pitch is true melanosis. Prevention is best accomplished by personal hygiene, good ventilation, sanitary conditions in plants, night operations, rotation of work and selection of employees. Appropriate protective and therapeutic measures include the application of creams and lotions containing physical and chemical blockers of light.

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- 620 PROTECTIVE CREAMS IN THE PREVENTION OF DERMATITIS. G. C. Harrold. Occup. Hazards & Safety, 1, 18-20 (July 1939).
Supplementing the mechanical types of dermatitis protection equipment--gloves, clothing, leggings, shoes--are creams, ointments and chemical mixtures. These substances can also be classed as mechanical forms of protection but they offer the additional factor of a cleansing action; the application on clean hands three times a day and the resultant washing off of the cream will in itself be an aid in the prevention of dermatoses. The best protection requires the use of a specific type of cream or ointment for each general group of irritants; no single cream is a positive protection for all substances. The types of creams for use with specific agents are not given in the paper, probably because of differences in trade names. Creams for certain dermatitis producing substances used in industry are on the market and their use is recommended in this article.