

Air Hygiene Foundation of America, Inc.
4400 Fifth Avenue,
Pittsburgh, Pa.
June 8, 1939

REFERENCES TO RECENT LITERATURE ON INDUSTRIAL DISEASES

(A) News Items

- 436 RESPIRATOR APPROVED BY BUREAU OF MINES FOR LEAD FUMES.
Willson Products, Inc. in a circular, have announced the approval by the U. S. Bureau of Mines of a new respirator for protection against Type A Dispersoids, fumes of metals such as lead, mercury, manganese, arsenic, copper, zinc, etc. This is the first respirator of this type to receive the approval of the Bureau.
- 437 OHIO INDUSTRIAL HYGIENE BULLETIN.
A new publication has been started by the Ohio Department of Health, Columbus. It is to be issued monthly by the Department and will contain informational and educational material of interest to all employers. The first issue, April 1939, contains items on the staff and laboratories of the department, mobile laboratory, reporting of occupational diseases in the state and other items of general interest.

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

- 438 NOTE ON AN IMPROVED CELL FOR DUST COUNTING. E. J. Dumm. J. Ind. Hyg. & Toxicol., 21, 202-3 (May 1939).
A description is given of a new cell for use in counting impinger dust samples. The new cell consists of two parts, one of which is a glass plate 1 mm. thick, ground on both surfaces, with a central hole of such a diameter that the cell contains approximately 0.25 ml. The other part is a larger plate of optically flat polished glass. Both are of "pyrex" glass. Any suitable cover glass, such as those now used, may be employed as a cover glass. The new cell greatly reduces the loss of time in cleaning and recontaminating the standard Sedgwick-Rafter cell. The comparatively large sealing area prevents leakage of air into the cell caused by evaporation of the liquid. Although no definite data has been collected to compare counts using the new cell with that of the Sedgwick-Rafter, routine plant studies have confirmed its apparent accuracy. The cell could also be easily adapted to plankton, sewage or bacteriological studies because of the simplicity of design and resistance to attack upon autoclave sterilization.
- 439 THE RATE OF PRODUCTION AND THE FREE SILICA CONTENT OF THE FINE DUST PRODUCED BY ROCK DRILLING. A. Shaw and J. Q. Graham. Trans. Instn. Min. Engrs. London, 97, 104-15, (April 1939). (British).
The free silica content of fine dust is almost always less than that of the rock from which it is formed. It is dependent also on the rate of drilling, being slightly higher the slower the rate of drilling. The free silica dust production expressed as grams of dust per foot of hole drilled may be taken as an indication of the silicosis producing character of the rock. The results indicate that all rocks from which more than 25 gm. of free silica-dust are formed per foot of hole drilled should be considered harmful, and that precautions should then be taken.

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References to Recent Literature - 2

- 440 SILICOSIS AND ITS PREVENTION. J. S. Haldane, F. Haynes, A. Shaw and J. Q. Graham. Trans. Instn. Min. Engrs. London. 97, 40-67, (April 1939). (British). It is suggested that the term silicosis be applied only to a fibrotic condition of the lungs in persons with an exposure to dust containing a high proportion (50% or more) of free silica. Clinical and radiological examination should not be regarded as sufficient basis for a diagnosis unless there is a reasonable history of exposure to free silica dust. Although a large number of coal workers in South Wales have been certified as silicotic, the work-histories of the cases show that the men have not been subjected to highly siliceous dusts. The phthisis death-rate among the coal miners, as shown by their statistics, is not significantly higher than in the general population of the district. The high incidence of bronchitis among coal miners should not be attributed to silicosis, as has sometimes been done in the past. It is emphasized, however, that the inhalation of excessive amounts of any dust will cause pulmonary damage. Following the article are 15 pages of interesting discussions by other authorities in the field. Dr. H. B. Jones states that the authors' definition of silicosis (above) is highly misleading, as proved cases of silicosis in South Africa have been caused by dusts with as little as 4% free silica. In all, the paper contributed little that has not already been known about the disease.
- 441 REPORT OF THE MEDICAL RESEARCH COUNCIL FOR THE YEAR 1937-8. H. M. Stationery Office, London, (1939). (British). Among the large number of researches referred to in this report are some dealing directly with industrial health. The disease of coal miners, which resembles silicosis clinically, but not radiologically, is not compensable, whereas silicosis is compensable. Efforts are being made to continue the study of anthracosis in South Wales. Another research being carried on is the work of the Committee on Toxic Solvents, which, through the Association of Chemical Manufacturers, checks at an early stage the toxicity of any new solvents that are introduced. Mention is made of a publication which summarizes the literature on toxic solvents, fulfilling a very useful purpose. Other less important researches along industrial health lines are mentioned.
- 442 THE PRESENCE OF "CURIOUS BODIES" IN THE LUNGS OF SOUTH AFRICAN GOLD MINERS. Williams. J. Path. & Bacteriol., 48, 475-7 (March 1939). (British). "Curious bodies" is the term often applied to the peculiar structures found in asbestotic lungs. They are light colored, but similar dark ones have been found in the lungs of coal miners. The author reports briefly on such bodies seen in the lungs of 32 South African gold miners she has examined. Both light and dark colored bodies were found, and in some lungs both types were present simultaneously. There was no constant relation, however, between the presence of bodies and silicotic findings, and Dr. Williams is sure that the bodies are not significant in the development of anthracosis in the coal miners and trimmers she has examined. They are probably the result of chance inhalation of fibers or spicules. These black cored bodies evidently cannot be produced experimentally, although the pale asbestotic ones can be.
- 443 THE PRODUCTION OF DUST IN HARD HEADINGS AND MEANS FOR ITS SUPPRESSION. J. Q. Graham, D. G. Skinner and W. H. Walton. Trans. Instn. Min. Engrs. London. 97, 83-103 (April 1939). (British). Experiments are described which illustrate the concentrations of dust in the chief operations involved in the driving of hard headings, namely drilling, shot firing and filling. The most important means found to reduce the dust was the use of wet drilling methods. The use of a mist projector, with a wetting agent in the spray water, was only slightly successful.

References to Recent Literature - 3

- 444 A DEVICE FOR ARRESTING EXPLOSIONS. G. Allsop, F. J. Hartwell and R. V. Wheeler. Trans. Instn. Min. Engr. London, 97, 20-39 (April 1939). (British).
A description is given of arrangements whereby firedamp explosions in coal mines can be extinguished. The arrangements involve the provision of (1) mortars from which a cloud of incombustible dust can be projected into the path of the explosion, and (2) thermal relays which, when subjected to the heat of an explosion, close an electric current which operates the mortars. The incombustible dust found most effective consists of 80% common salt, 18% chalk and 2% magnesium carbonate. Tests made with the apparatus have proved its effectiveness.
- 445 HEALTH CONSERVATION OF A METAL MINER. W. B. Daly. Min. Cong. J., 25, 6-7 (April 1939).
To the mine operator, the problem of industrial health is not new. It has always been a more or less hidden factor in his costs. The metal mining industry is fortunate by comparison with many other industries, in that it has but one important occupational disease, namely silicosis. The author, Manager of Mines, Anaconda Copper Mining Company, traces the dust control measures of that company since the campaign started in 1918. The paper gives a good broad discussion of the general problem of dust and its control.
- 446 SETTLING THE DUST PROBLEM. J. M. Roche. May Safety News, 39, 18-19, 72-4, (May 1939).
Dust control is an important phase of industrial engineering management and should be given consideration. Much experience has been gained during the past and industries have found that the cost of control of the dust problem has not been prohibitive. Consideration should be given to dust, whether hygienically significant or not, in the design of new buildings or new processes that may be potentially dusty. Air tests or dust counts should be made at regular intervals to check the efficiency of the systems, to maintain higher employee morale and to find unsuspected hazards.
- 447 APPLY MODERN CLEANING METHODS. Fred Daniels. Foundry, 67, 44-6, 92 (May 1939).
An illustrated description is given of the equipment in the new cleaning department of a foundry. Small castings are cleaned in a tumbleblast machine; large castings are cleaned by first removing the core with a stream of high pressure water, then blasting with steel shot. All dust arresting is by wet methods and the sludge is reclaimed. This modern installation has not only almost eliminated the dust hazard in the foundry, but has realized a saving of over 75% in the time of removing cores in large castings.
- 448 PRACTICAL METHODS FOR THE CONTROL OF HYGIENIC EXPOSURES. G. A. Coburn. Am. J. Pub. Health, 29, 501-6 (May 1939).
The author presents a summary of the general considerations in prevention of industrial diseases. The hazards of dust, chromium, lead, and other materials are discussed. The paper was presented at the October 28, 1938, meeting of the American Public Health Association in Kansas City. Following the paper is an 8-page discussion compiled by C. L. Pool which summarizes and describes typical methods for control of exposures in certain industries.
- 449 BEYOND JUST "THE LETTER OF THE LAW." H.E. Roberts. Occup. Hazards & Safety, 1, 15-18, 28, (May 1939).
The trend of court decisions is definitely towards application of the common law, of considering an occupational disease the same as an injury, wherever specific coverage has yet to be enacted. Cases are presented to show the devious reasoning by which the courts have made awards for industrial disabilities and to show management why it may be wise to look beyond the letter of the law in determining its responsibility.

References to Recent Literature - 4

- 450 ALLAYING DUST IN BITUMINOUS-COAL MINES WITH WATER. D. Harrington, J. J. Forbes, F. E. Cash, E. H. Denny, C. A. Herbert, D. J. Parker, C. W. Owings and A. W. Miller. U. S. Bur. of Mines, Tech. Paper, No. 593, 55 pp. (1939). For sale by Supt. of Documents, Washington, D. C. for 15 cents.
This bulletin describes more fully (see Abstract 118, 1939) the researches of the Bureau of Mines on the use of water in reducing dust in coal mines. To prevent dust explosions in mines both water and dusting methods are being used in conjunction. The dusting cannot be applied within 15 feet of the face, and it is at this point where much of the coal dusts and gases are encountered. This bulletin enumerates the dust producing sources and describes practical methods of using water as one of the most effective methods of allaying dust in bituminous-coal mines. Excellent illustrations and sketches are included. Apart from the reduction of dust because of its explosive qualities an increase of dust in the efficiency of the workers is claimed in some mines, due both to reduced discomfort from coal dust and to increased visibility.
- 451 DIAGNOSTIC STANDARDS. TUBERCULOSIS OF THE LUNGS AND RELATED LYMPH NODES. Tentative Edition, National Tuberculosis Association, 1938. Copies obtainable from the Association, Address: 30 W. 50th St., New York City.
This 26 page booklet follows the 10th edition of 1935 and presents simply and briefly the outstanding points to consider in diagnosing pulmonary tuberculosis. The industrial physician who examines large groups of workmen has an unusual opportunity to detect tuberculosis and this pamphlet should help him in arriving at a proper diagnosis. The finding of such cases not only improves industrial health but also that of the general public.
- 452 TUBERCULOSIS MORTALITY IN INDUSTRIAL POPULATIONS OF MASSACHUSETTS AND MICHIGAN. C. C. Dauer. Am. Rev. Tuberc. 52, 603-16. (May 1939).
Tuberculosis mortality rates have been higher in four Massachusetts cities than in a similar group of approximately the same size in Michigan. It appears that the difference in mortality in the two groups of cities can best be explained on the basis of more unfavorable environmental and social conditions in the Massachusetts groups. It also appears that indirectly the composition of the population with respect to nationality has played some part in these differences in mortality. The paper includes tables and statistics which describe the data according to age groups, type of occupation, density of population and housing facilities.
- 453 REPORT OF THE DEPARTMENTAL COMMITTEE ON COMPENSATION FOR CARD ROOM WORKERS. H. M. Stationary Office, London, 1939.
The Committee was appointed to consider an equitable compensation code for card room workers in cotton mills. For a long time it was thought that there was no specific disease among the operatives which could be the subject of precise clinical diagnosis, but the present Committee recommends the permission of workers to apply for compensation for a respiratory disease termed "byssinosis," after having worked in a card room or cotton blowing room for 20 years or more. It is now thought that a special medical board is able to arrive at a definite conclusion as to the occupational origin of this disease, which resembles bronchitis and emphysema and which is presumably characteristic of the occupation.
- 454 THE FLOW OF AIR AND ITS DISTRIBUTION THROUGH DUCTS. PART 4. DUCT LAYOUT. J. R. Zwickl. Heat. & Vent., 36, 48-50, (May 1939). See Abstract 378, 1939.
This paper discusses the methods of duct layout and design based on technically correct methods. All sections of the system are first calculated as equivalent round ducts and then their equivalent rectangular ducts substituted, if necessary, to fit the structural requirements of the building. The designing is based on the flow in the selected main duct and branches are calculated as percentages of the main. Equations for calculating duct sizes and head losses are included and explained.

References to Recent Literature - 5

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

- 455 RESPIRATORY HAZARDS OF ELECTRIC ARC WELDING. O. A. Sander. Ind. Med. 8, 177-80 (May 1939).

Twenty years of electric welding experience seem to indicate that the operation is not a hazardous occupation provided the fume concentration is kept below a certain level. This danger level appears to be higher than the concentrations of fumes usually encountered in moderately large and fairly well ventilated rooms. A great deal depends upon the materials being welded and materials in the welding rods. Newer types are continually being developed and care should be taken in the use of them. Some of the newer materials are manganese, selenium, arsenic and cadmium. The danger of lead poisoning is of consequence when materials containing lead are used. Welding should not be done in confined spaces without the use of adequate ventilation even for short periods of time. Manufacturers of welding materials might well consider a program of research in the analysis of fumes given off by the newer electrodes; a program of this sort would be of benefit to the whole metal industry.

- 456 HEALTH HAZARDS IN CHEMICAL INDUSTRIES. H. F. Smith, The Chemist, 16, 187-94, (April 1939).

While it may be safer to assume that all chemicals may be potentially toxic unless definitely known to be otherwise, it is stated that any chemical material, however toxic, can be handled with a reasonable degree of safety if its toxicity is known and the indicated protective measures are followed. The author discusses the hazards of toxic substances, their portals of entry into the body, the chemical and physical state in which the elements act and the organs generally affected. A program is described for measuring the known hazards and for evaluating the unknown hazards of new chemicals. The latter generally involves lengthy experimentation, usually with animals, to determine acute and chronic effects. A list of protective measures for the use of toxic materials is included.

- 457 RESPIRATORS. R. W. G. Davis. Chem. & Ind. 58, 334-5. (April 15, 1939). (British)
The term respirator is applied to any device or appliance designed to afford protection to the respiratory organs of the wearer. The uses and limitations of each kind (applying particularly to chemical gases) is explained. Suggestions are offered for the guidance of those who are called upon to select and provide equipment for various chemical processes.

- 458 GASSING ACCIDENTS. S. H. Wilkes and D. Matheson. Chem. & Ind. 58, 316-23, (April 15, 1939). (British).

The authors, as inspectors of the Factory Department in England, have tabulated the reported gassing accidents that have occurred during the past six years. It is shown that carbon monoxide produces far more accidents than any other gas, almost as many as all others combined. Other gases encountered are hydrogen sulfide, sulfur dioxide, chlorine, nitrous fumes, ammonia, benzol and trichloroethylene, to mention a few. Accidents are classed as those due to "expected" gases and as those due to "surprise" gases, and some of the most serious accidents are caused by the latter in locations where the gas is not manufactured or handled, but is generated or encountered by accident. It is noted that chemical works do not produce a high proportion of the accidents, and that most are in the iron and steel trades, particularly the blast furnace and its associated equipment. Lengthy descriptions are given of certain general precautions to be followed.

- 459 WAR GASES AND INDUSTRIAL HAZARDS IN THEIR MANUFACTURE. H. N. Cole, J. R. Driver, S. S. Bowen and G. Cooper. Arch. Dermat. & Syphilol., 39, 45-54 (January 1939). The authors were consultants in a factory in which diphenylchloroarsine (DA), chloroacetophenone (CN), diphenylamine-chloroarsine (DM), dichlorethylsulfide (ES mustard gas), and phenyldichloroarsine (sternite) were prepared and which acted as irritants on the skins of workers who were exposed. The precautions and treatments in the use of each are listed. In general, the authors suggest the following prophylactic measures: (1) absolute cleanliness in the plant; (2) change of work clothes every 2 days; (3) careful washing of hands and face before each meal; (4) bathe and change to street clothes every night; (5) use gas masks in all operations where exposure to dangerous gases is possible; (6) with all products except mustard gas, the wearing of rubber gloves and a mustard suit; and (7) immediate treatment of areas affected by DA or DM with fresh solution of sodium hypochlorite. Areas affected by CN should be treated with 10% solution of sodium bicarbonate.
- 460 THE DETECTION OF TOXIC GASES AND VAPORS IN INDUSTRY. K. B. Kallender. Chem. & Ind., 58, 339-42 (April 15, 1939). (British). The sense of smell and the behavior of animals are both unreliable as general methods for detecting the presence of traces of toxic gases encountered in many industrial atmospheres. The need for simple, rapid, semi-quantitative tests, sensitive to very low concentrations of gases and vapors is pointed out, and the suitability of existing methods discussed. A description is given of such a method for the detection of certain gases, some of which have been published by the Dept. of Scientific and Industrial Research (England). Those published to date have referred to hydrogen sulfide, hydrogen cyanide, sulfur dioxide, nitrous fumes and benzene; all have been cited in these abstracts.
- 461 THE TOXICITY OF ORGANIC SOLVENTS. T. McClellan. Chem. & Ind. 58, 339-42, (April 15, 1939). (British). Acute and chronic poisoning by vapors of organic solvents are described and examples of poisoning in man are given. The object has been to stress the danger not only of exposure to high concentrations but also the less frequently understood danger of exposures to low concentrations. A clearer realization of these dangers will do much towards the application of caution in the use of these substances in industry.
- 462 COLORIMETRIC DETERMINATION OF HEMOGLOBIN AS REDUCED HEMOGLOBIN OR AS ACID HEMATIN, BASED ON MANY INDUSTRIAL-MEDICAL BOARD EXAMINATIONS. K. Humpferdick. Deutsch. Arch. f. klin. Med., 183, 379-86, (February 7, 1939). (German). In two-thirds of 400 samples of blood, the hemoglobin values by Burker's hemoglobinometer and the Zeiss-Ikon hemometer (acid hematin) were in agreement. Occasional acid hematin values differed greatly from those by Burker's method, probably because of wide variations in the course of formation of acid hematin. By Burker's method, absolute hemoglobin content per erythrocyte showed very little variation in the 400 subjects. Of the total number, 30% had 5 to 6.2 million erythrocytes per cu. mm.
- 463 CHRONIC CARBON MONOXIDE POISONING AND PERNICIOUS ANEMIA. H. Biedermann. Folia Haematol., 61, 186-200 (1938). (Italian). A subject repeatedly exposed to carbon monoxide developed hematological and neurological symptoms indistinguishable from those in pernicious anemia. The rapid regression of the neurological signs under therapy lead the author to regard the signs of pernicious anemia as symptomatic consequences of the carbon monoxide poisoning, rather than as indicators of an independent primary pernicious anemia. It is suggested that some apparently refractory cases of pernicious anemia may be due to unsuspected, repeated exposure to carbon monoxide.

- 464 METHODS FOR THE DETECTION OF TOXIC GASES IN INDUSTRY. NO. 3. NITROUS FUMES. Dept. of Sci. & Ind. Research, Great Britain. H. M. Stationery Office, London, 1939.

Nitrous fumes are usually reddish-brown in color and consist of a mixture of NO_2 and NO , with possibly traces of NO . Dangerous concentrations may be encountered in many important industries. They are also encountered in connection with electro-plating, engraving, metal cleaning and photogravure processes, and are formed during oxy-acetylene welding when the flame plays on cold steel in a confined space. They have caused fatalities during the heat treatment of metals in molten nitrates. In the test described, one of a series for use by unskilled personnel, the sample is pumped through a solution of α -naphthalene and sulphuric acid in acetic acid by a standard hand pump. The number of strokes of the pump to obtain the standard rose-pink color determines the concentration, which may be detected to as low as 1 part in 100,000 (0.03 mg./l). Detailed descriptions of the pump, reagent preparations of the reagents and sampling methods are given in the leaflet.

- 465 CEREBRAL SUBCORTICAL MYELINOPATHY IN CARBON MONOXIDE POISONING. Y. K. Hsia and Y. L. Ch'eng. Brain, 61, 384-92 (1938).

The authors report and discuss two cases of "relapsing" carbon monoxide poisoning, in which diffuse degenerative lesions developed in the deeper cerebral white substance--lesions less often described than are the basal lesions. Of special interest is the absence of bilateral softening of the globus pallidus in these cases since this is regarded as almost pathognomonic of acute carbon monoxide poisoning. After listing the brain lesions commonly found and reported, the authors discuss the various theories which have been presented to explain their development. They arrive at the conclusion that no single theory seems to be adequate to explain in its entirety the action of this gas on tissue cells, and that probably several factors act together. Anoxemia, specific vascular disturbances, and the anatomical factor of peculiar blood supply in specific parts of the body (particularly in the brain), are believed to act together in producing the pathological lesions found.

- 466 FURTHER OBSERVATIONS ON THE POSSIBLE SYSTEMIC TOXICITY OF CERTAIN OF THE CHLORINATED HYDROCARBONS WITH SUGGESTIONS FOR PERMISSIBLE CONCENTRATIONS IN THE AIR OF WORKROOMS. C. K. Drinker. J. Ind. Hyg. & Toxicol., 21, 155-9 (May 1939). Experiments on the toxicity of these compounds have been continued and are reported in the paper. It is well known that a diet rich in calcium is effective in preventing acute atrophy of the liver from exposure to carbon tetrachloride. To discover whether calcium in the diet would protect against liver damage from a toxic chlorinated hydrocarbon, two groups of rats were fed diets of high and low calcium, respectively, and subjected to inhalation of high concentrations of a mixture of penta and hexachloronaphthalenes. It was found that a high calcium diet has no protective effect against the characteristic liver lesions caused by these compounds. To check a supposition that xanthine injections reduced the toxicity of these compounds, another series of animals was exposed to the vapors, and part of them were given xanthine in addition. No differences in the effects were noted. That the chlorinated hydrocarbons are broken up within the body was proven by a significant increase in the urinary chloride following inhalation of the compounds. Included in the paper is a list of 15 of the important compounds of this series showing permissible limits of these substances in air. Most of them contain from 45 to 66% chlorine; the limit of all with but three exceptions, is 0.5 mg. per cu. meter of air. The exceptions are: trichloronaphthalene plus a trace of tetrachloronaphthalene -- 10.0 mg. per cu. m.; chlorinated diphenyl -- 10.0 mg. per cu. m.; and tetra and pentachloronaphthalenes -- 1.0 mg. per cu. m.

References to Recent Literature - 8

- 467 TOXIC EFFECTS UPON RABBITS OF PENTACHLOROPHENOL AND SODIUM PENTACHLOROPHENOL. R. A. Kahoe, W. Deichmann-Gruebier and K. V. Kitzmiller. J. Ind. Hyg. & Toxicol., 21, 160-72 (May 1939).

Pentachlorophenol is used commercially as a preservative for wood and wood products. Since manual handling of treated lumber cannot be completely avoided, experiments on the material were carried out to check the reported toxic properties of the material. The substance when dissolved is capable of penetrating the skin surfaces and the investigations were made with this in mind. Pentachlorophenol, as well as its sodium salt when absorbed into the tissues (cutaneously or subcutaneously) in sufficient quantity, produces an acute toxemia. The minimum lethal dose, applied cutaneously, varied, depending on the solvent, from 39 mg. per kilogram of body weight (in pine oil) to 350 mg. per kg. (in olive oil). Animals not poisoned fatally usually recovered fully within various short periods and there was no indication that the absorption of repeated small doses induced a chronic type of poisoning. It is stated, however, that this latter point needs further observation and for this reason the material should be employed with caution.

- 468 THE TOXICOLOGY OF SOME GLYCOLS AND DERIVATIVES. S. P. Laug, H. O. Calvery, H. J. Morris and G. Woodard. J. Ind. Hyg. & Toxicol., 21, 173-201, (May 1939).

This excellent paper presents a thorough review of the literature and reports on an extensive series of experiments with these compounds in determining their toxicities. Over 2600 animals were used in the tests and the methods of statistical analyses employed are especially interesting. After correlating the information in the literature with the results of the experiments, it is concluded that ethylene glycol, diethylene glycol, ethylene glycol mono-ethyl-ether, diethylene glycol mono-ethyl-ether and diacetone should be entirely omitted from food and drug preparations and that propylene glycol should be avoided except in very small concentrations.

- 469 FATE OF TRICHLOROETHYLENE IN THE ORGANISM. H. M. Barrett and J. H. Johnston. J. Biol. Chem., 127, 765-70 (March 1939).

Trichloroacetic acid was identified in the urine of dogs which repeatedly inhaled narcotizing doses of trichloroethylene. This may be present as a conjugated product or may possibly be a decomposition product of some more complex unstable compound actually excreted. There are indications that the same material is present in the urine of humans exposed to trichloroethylene.

- 470 TRICHLOROETHYLENE DEGREASING TANKS AND THEIR SAFE OPERATION. W. B. Harris, C. B. Ford, F. A. Patty and T. Hatch. Indust. Bull., N. Y. State Dept. of Labor, 19, 132-4 (March 1939).

This paper gives the results of a survey of 50 plants using trichloroethylene degreasing tanks, with a detailed survey of 15 of those studied. Recommendations are made for the design of equipment, location of equipment, local exhaust ventilation, and operation. Dimensions of tank and room, quantity of flow and rate of flow for adequate ventilation are given. The exhaust ventilation should be applied laterally at the edges of the tank since the heavy vapor tends to roll over the edge and fall to the floor. A ventilating rate of 60 c.f.m. per foot of tank perimeter has been found to be adequate. This produces an air movement of approximately 20 f.p.m. toward the exhaust openings at a distance of one foot from the slot. It is necessary to keep the rate of air flow as low as possible to maintain efficiency of control and to prevent too large losses of the solvent.

References to Recent Literature - 9

- 471 **TETRACHLOROETHYLENE IN THE TREATMENT OF HOOKWORM DISEASE WITH SPECIAL REFERENCE TO ITS TOXICITY.** P. B. Fernando, M. d'Silva, G. K. B. Stork and G. R. Sinnatamby. *Indian J. Med. Res.*, 26, 759-83 (January 1939). (India).
Tetrachlorethylene, studied in 111 patients, was found to be effective in expelling hookworms; a single dose of 8 cc. for adults will expel 100% (as many as 510 worms) but has little effect on round worms. Careful examination of each patient was made in order to check the toxicity. Several liver tests were employed. No appreciable toxic effect on the liver was noted in any of them even in those receiving double the maximum adult dose in general use. No depressant effects of any importance were noted and no toxic action on the kidneys. There was occasional giddiness, faintness and weakness but these were only temporary. A dose of 8 cc. is the most effective, but one of 4-5 cc. can be given to adults at intervals of 10 days. The effects on children are also discussed.
- 472 **EXPERIMENTAL CARBON TETRACHLORIDE POISONING IN THE CAT. II. THE PREVENTION OF LIGATION OF SINGLE BILE DUCTS.** H. L. Stewart and A. Cantarow. *Arch. Path.* 26, 1121-30 (1938). For abstract of first article in this series, see No. 758, 1938.
The authors experimented with 44 cats, divided into two groups. The first received 0.5 gms. pure carbon tetrachloride per kg; in the second group, one or more ducts from the left lobes of the liver were ligated and divided. Two weeks later this group was given the same dose of carbon tetrachloride as Group I. Cats in both groups were sacrificed at different intervals and the changes noted. Evidence of damage was much less marked in the second group in the first 6 days after carbon tetrachloride injection; by the end of 6 days, the Group II livers were essentially normal in contrast to signs of extensive residual damage in those of Group I. Also abnormalities in bilirubinemia, retention of bromsulphalein and urobilinuria are less marked in those with ligation of ducts.
- 473 **COMPARATIVE ACTION OF PURE AND COMMERCIAL BENZENE ON THE VASOMOTOR SYSTEM OF ANESTHETIZED DOGS.** R. Charlier and P. Angenoy. *Compt. Rend Soc. biol.*, 130, 779-82 (1939). (French).
NEW RESEARCH ON THE TOXICITY OF BENZENE. R. Charlier. *Arch. Intern de Pharmacol. et Therap.*, 47, 123-53 (February 1939). (French).
The authors describe Dautrebande's work on the physiological effect of "crystallizable commercial benzene" on the central nervous system, the peripheral vasomotor system and the myocardium, and present the results of similar research on (1) the toxicological effect of chemically pure benzene, (2) a comparison of the effect of commercially and of chemically pure benzene, and (3) the origin of the greater toxicological effect of commercially pure benzene. Experiments conducted on three organs (heart, intestines, and vasomotor system) showed commercially pure benzene to have a greater toxicity than chemically pure benzene. Research was then conducted to determine the compounds which caused this result. Following the fractionation of commercially pure benzene into 4 important groups, it was found that the fraction boiling from 80.4 to 81.2°C. had greatest toxicity, greater than pure benzene itself. Further studies of this fraction and of the impurities in the substance are to be undertaken later.
- 474 **SULFURETTED HYDROGEN PRODUCED BY BACTERIA IN A LEAD MINE.** J. W. Edington. *J. Hygiene*, 38, 683-7 (November 1938). (British).
Smarting eyes, markedly congested conjunctivae, and a stinging sensation in the nose and throat were found in 12 workers in a lead mine. The strong smell of hydrogen sulfide in the part of the mine where they worked was traced to the stagnant mine water in which there were sulfur deposits. Samples of the water yielded great numbers of bacteria. Improved ventilation eliminated the troublesome gas.

- 475 **INTOXICATIONS BY BENZENES.** M. Duvoir and H. Desoille. *Presse med.* pp 331-2 (March 1, 1939). (French).
Acute intoxications, usually by accidental exposure to large concentrations of vapors, cause the same injury as do other lipid solvents. The first symptoms are inebriation and vomiting but these disappear rapidly in fresh air. A more severe form causes loss of consciousness or heart failure and death. In chronic poisoning only the aromatic hydrocarbons of the benzene ring cause blood disturbances. Impurities play a small role and benzene does not seem to attack the blood. Methods of treatment and prophylaxis are given. If exposure cannot be prevented by enclosure of the process or adequate ventilation, some other substance should be employed. Last year the French Society of Hematologists recommended that where they are not indispensable, benzenes must be prohibited.
- 476 **FATAL CASE OF ANGINA PECTORIS AFTER BREATHING HYDROGEN SULFIDE GASES.** A. Mellfors. *Munch. Med. Wochenschr.*, 85, 1149 (1938). (German).
During experiments with hydrogen sulfide gas the patient inhaled rather small amounts of the gas. Although others in the laboratory were equally exposed, none showed any reaction. The patient had a dizzy spell and suffered chest constriction and in the evening had irritation of the throat, cough, weak and irregular pulse, heart symptoms, diffuse bronchitis, diarrhea, vomiting. The next morning there was sugar in the urine and the blood sugar was 126 mg.%. He was recovering, but on the 9th and 10th days, disregarding orders and actively moving about, he suffered a relapse of the heart and chest pains and the blood pressure again fell. This was followed by chills and fever and angina pains were felt at the slightest movement. In spite of treatment the condition became aggravated and the man died 6 hours later of angina pectoris (severe constricting pain in the chest).
- 477 **EARLY DIAGNOSIS OF OCCUPATIONAL ARSENIC POISONING.** G. Straube. *Deutsch. med. Wochenschr.*, 65, 334 (1939). (German).
In examining vineyard workers the author has attempted to distinguish between arsenic absorption and arsenic poisoning. He believes that those cases showing only hyperkeratosis may be considered as suffering from arsenic absorption. The presence of horny pearls, that can be discovered at an early stage by the use of filtered ultraviolet light, is characteristic of the latter.
- 478 **ANIMAL EXPERIMENTS ON LUNG CHANGES AFTER MANGANESE DUST INHALATION.** H. Roploh. *Arbeitsschutz*, pp 144-6 (1939). (German).
The author, investigating the pneumonia producing properties of manganese, had rabbits and mice inhale dust containing 90% manganese dioxide. Of 32 animals, 9 died within the first 19 days, all of which showed more or less pronounced bronchopneumonia. Of the survivors some were infected intranasally with pneumococci and half of them exposed to drafts and cold. But three of those infected survived, and it was in these that the lung changes found were most pronounced; those dusted only had no lung changes. Since Thomas slag induces pneumonia in man also, a dust, containing 10% manganese dioxide to simulate the slag dust, was used in continued experiments. About the same results were obtained, namely, that those infected with pneumococci showed severe lung changes, that in those not infected the lung changes were not so marked. The author believes that the pneumonia caused by Thomas slag can possibly be traced to the manganese dioxide.
- 479 **NOTES ON WORKING WITH BRONZE POWDERS.** M. Deribere. *Ann. d'Hyg. Pub. Indust. et Soc.* 16, 506-7. (1938). (French).
Bronze powders, which are composed of salts of copper, are used in several industrial processes. The workers, under the impression that these powders are poisonous, tend to ascribe any sickness they experience to this cause. Large doses of copper salts are indeed poisonous; but such doses seldom, if ever, occur industrially. The copper salts are rapidly eliminated and do not set up a chronic poisoning within the body.

- 480 TOXICOLOGY OF FLUORIDES. A. O. Gettler and L. Ellerbrook. Am. J. Med. Sci., 197, 625-37 (May 1939).

The methods of detection and quantitative determination of fluorine in body tissues are explained in detail and the normal content of fluorine in many of the organs is listed with both values from the literature and those found by the authors. Very small amounts of fluorine are found in normal human tissues (20 to 80 micrograms in 100 grams) and there seems to be no appreciable accumulation of fluorine in any one of the vital organs. The fluorine content of teeth and bones is higher, being of the order of 0.01 to 0.03%, which probably varies with the amount of fluorine in the daily diet. The symptoms of fluorine poisoning are reviewed and an attempt is made to estimate the minimum lethal dose (by ingestion). Not much attention is given to the inhalation of compounds of fluorine.

- 481 CHRONIC FLUORINE POISONING SEEN FROM THE ROENTGENOLOGICAL STANDPOINT. P. F. Moller. Brit. J. Radiol., 12, 13-20 (January 1939). (British).

Chronic fluorine poisoning in man was discovered in 1931 when the author was investigating osteitis in factory workers and came upon curious changes in the bones of a number of workers in a cryolite factory. It has been recognized in animal experimentation many years before and it was found that the symptoms in both were the same. These symptoms were acute in character and included lack of appetite, nausea, and vomiting; they disappeared when the individual went into the open air. It was also noted that there is an apparent tolerance to the dusts following continued exposures. The principal sign of fluorine poisoning is in bone changes, especially in the spongy bones. In the affected individuals, there was almost complete disappearance of normal body structure, the bones of the vertebrae and ribs having almost a milky white opacity. In the extremities, the compact portion of bone was much thickened and the marrow cavities narrowed. The earliest changes were noted after 2 1/2 years of exposure; more extensive changes occurred after 4 to 11 years. Another feature of the condition concerned the teeth. These changes, described as mottled teeth, have been recognized in nearly all countries. It is stated that because the occurrence of fluorine is so extensive in nature, it presents a real dust problem. Work with cryolite, phosphorite and calcium fluoride should, in particular, be done with extreme caution. It is important that radiologists recognize the invadence of fluorine poisoning, and certain aids in diagnosis are given in the paper.

- 482 INDUSTRIAL CHLORINE GAS POISONING. E. Schulze. Sam. v. Vergiftsf., 10, 1-2 (January 1939). (German).

A worker in a small chemical plant was exposed to chlorine gas during the course of an experiment. Although he had breathed only a small amount of the gas, he had to be helped from the room and then lost consciousness. At the hospital he developed an acute, severe bronchitis, and about 5 weeks later this seemed cured but it again developed a few weeks later. The bronchitis became chronic and the patient was troubled with an increasingly severe cough and dyspnea. Respiratory functions were badly disturbed; vital capacity was only 1000 cc. and respiratory minute volume was almost double the normal. The case is unusual in that non-fatal cases usually do not lead to this chronic condition.

- 483 UNION CONFERENCE ON LEAD POISONING. Labor Standards, 2, 58-6. (April-May 1939).

The control of lead poisoning was discussed by the Battery Council of the United Electrical, Radio and Machine Workers of America at a meeting in Philadelphia on March 15. An outcome of the meeting was the appointment of standing committees to gather detailed information and to conduct further conferences on the subject of occupational diseases.

References to Recent Literature - 12

- 484 THE EARLY DIAGNOSIS OF ACUTE AND LATENT PLUMBISM. F. L. Smith, 2nd, T. K. Rathwell and G. E. Marcell. *Am. J. Clin. Path.*, 8, 471-508 (1938). Reprints obtainable from the senior author, Jefferson Medical College Hospital, Philadelphia, Pa.

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The many symptoms that may be found in lead poisoning are listed and mention is made of the difference in susceptibility to lead. The authors review figures given as normal lead in urine and concentrations in urine of exposed and poisoned persons. In discussing the significance of stippled cells, the authors list sixteen other pathological conditions in which these cells have been reported. In the author's series and experimental stippling did not precede symptoms and it often was absent in the toxic stage. Reticulocyte response and basophilic aggregation are not considered accurate as diagnostic tests. Detailed blood data are given on a large number of patients grouped according to clinical manifestations, and the authors believe that a differential diagnosis can be made by accurate determination of lead in serum, cells and fibrin fraction when considered in relation to the whole blood value. Their analytic method is given. In normal subjects, climatic, seasonal and daily changes, had no effect on whole blood values, nor did food, fatigue or violent exercise. It is significant that, in normal persons, lead was never detected in the serum, but in cases of plumbism, serum lead was present in amounts up to 0.015 mg. per 10 cc. In chronic poisoning, lead disappears from the serum but the whole blood lead values are higher than normal. If borderline cases are put on an acid diet, lead will reappear in the serum.

- 485 THE CLINICAL SIGNIFICANCE OF PERIPHERAL BASOPHILIA IN THE ERYTHROCYTE. E. H. Falconer. *Ann. Int. Med.*, 12, 1429-41 (1939).

The mean number of stippled erythrocytes in 205 normal adults was 92 per million red cells; in 234 patients with different clinical conditions, it was 363 per million. Five patients, to whom lead was administered, had 19,950 per million after symptoms appeared, but 2250 up to the time symptoms appeared. In 8 workers exposed to lead but free of symptoms, the stippled cell count was 2100. Administration of alkaline hematin to 2 patients resulted in stippled cell counts of 5250 and 1832. These data suggest that periph. basophilia is not a specific indication of either lead absorption or lead intoxication.

- 486 BLOOD REGENERATION IN EXPERIMENTAL LEAD POISONING BY A WATER SOLUBLE LIVER FACTOR. M. Lauro, G. S. deSacy and A. Arthus. *Compt. rend. Soc. et biol.*, 130, 642-4 (1939). (French).

A brief report of experiments on 55 rabbits given six different liver extracts after anemia induced by lead. Regeneration of blood began within 3 to 8 days after intravenous injection of the extract and reached a fairly high but sub-normal level. Control animals given no extract recovered only slightly. Regeneration took place regardless of animal's age, duration of treatment, amount of lead injected, gravity of anemia and time of liver injection.

- 487 INFLUENCE OF ACID AND ALKALINE DIETS ON PORPHYRINURIA IN EXPERIMENTAL LEAD POISONING. A. Capellini. *Med. del Lavoro*, 30, 33-43, (1939). (Italian).

Three rabbits on an acid diet and three on an alkaline one were given 30 cc. of 3% solution of lead acetate daily for 30 days. Porphyrine in a 24 hr. urine sample of the animals on an alkaline diet was 90, 53 and 108 micrograms. The corresponding figures for the animals on acid diets were 187, 136 and 152, but in these latter, the porphyrinuria dropped more quickly when the lead was discontinued.

- 488 **LEAD POISONING, LEAD CONTENT OF BLOOD AND OF EXCRETA.** S. L. Tompsett and A. B. Anderson. *Lancet*, pp. 559-62 (March 11, 1939). (British).
The lead content of blood and excreta of 29 cases of suspected lead poisoning was determined by the sodium diethyldithiocarbonate method, certain improvements in which are stated in detail. The investigation confirmed the opinion that the estimation of blood-lead is more satisfactory than the determination of the excretion of lead. The upper limit of normality for blood lead is placed as 100 micrograms of lead per 100 ml. When this limit is exceeded, or if there is a total daily excretion of 1 mg. or more of lead, then lead poisoning is present. Details are given of a large number of determinations made. The concentration of lead in the blood of these cases was ten to twenty times that in the urine. Nevertheless, it cannot yet be claimed that the chemical diagnosis of lead poisoning is infallible, even though it is surer than clinical methods.
- 489 **A NEW MICROCHEMICAL TEST.** C. Mahr. *Mikrochem.*, 26, 67-81 (January 14, 1939). (German).
Lead can be detected in the presence of other heavy metals by the formation of very insoluble and highly specific lead thiocyanate nitrate. To the lead-containing solution (in 2N nitric acid) 1/10 volume of solid thiocyanate is added. After diluting 1:100, formation of crystals is observed under the microscope. The lead thiocyanate nitrate precipitates as doubly refracting needlelike prisms, 20-50 microns long and very thin. The needles are often crossed and frequently united in star-shaped bundles. By this direct procedure lead can be detected in the presence of 60-70 parts bismuth, 75 mangan, and more than 100 of cadmium, arsenic, tin, silver, platinum and other metals. The metals of the ammonium sulfide and alkaline earth groups do not interfere at similar concentrations. The specificity may be increased about 10 times by a previous separation of the lead as lead oxide on the platinum electrode. The limiting concentration of lead is about 1:40,000.
- 490 **PAINTING PRACTICES.** C. D. Bridges. *Safety Eng.* 77, 44-7, (May 1939).
There are many different types of paints being manufactured by numerous firms, and so many ingredients are used that it is impossible to determine the toxicity of any paint. The safest practice is to employ all precautions possible when using any type of paint or lacquer. When spraying paints, exhaust booths are desirable where it is possible to employ them. A description is given of the elemental principals of exhaust booth construction. Where exhaust ventilation is not applicable, respirators should be worn. They should be supplied air respirators, as this type is more efficient and more comfortable for continued wear, and the air supply is convenient. The air line should be passed through a filter to remove fumes, dust, moisture, etc. It should be remembered that dust respirators do not protect against fumes. Paint dermatoses, due to allergy to the varied ingredients, may be controlled by protective clothing, and the use of protective skin creams such as vasoline and cold cream, and preventing the use of solvents for washing. Paint brushing involves exposure to the solvents and requires, primarily, good ventilation.
- 491 **MEDICOLEGAL COMPLICATIONS IN DERMATOLOGY CAUSED BY MASSACHUSETTS WORKMEN'S COMPENSATION ACT.** J.H. Blaisdell. *Arch. Dermatol. & Syphilol.*, 35, 69-80 (January 1939).
The author shows that the question of compensation is largely dependent on the interpretation which, since the enactment of the compensation act, has become evolved through practical experience. He stresses the difficulties that arise for the dermatologist in testifying before a group of lay referees because of the impossibility of always giving a definite "Yes" or "No" answer. He gives consideration to the use of patch tests in evidence before the referees. Following these discussions are several suggestions for changes in the present law.

- 492 CUTANEOUS ERUPTIONS AMONG INDUSTRIAL WORKERS. J. G. Downing. Arch. Dermat. Syphilol., 39, 12-32 (January 1939).
The author presents a large mass of important data relative to industrial dermatoses, taken from a study of 2000 cases. He has many tables which bear careful study by those interested in the subject. Prevention and diagnosis of dermatosis cases are much cheaper than neglect. A process should not be condemned as dangerous because one or a few workers are peculiarly sensitive. The largest number of cases occurred in young untrained workers between the ages of 20 and 25 and the hands were the most frequently involved area of the body. There is an interesting discussion of the distribution of dermatoses according to occupations, and there are excellent summaries of important contacts, materials used and characteristic effects in the different occupations. In discussing prevention he stresses the importance of detecting and eliminating hazards, the importance of mechanical devices, the importance of gloves, and protective liquids and creams. The author finds little value in pre-employment patch tests; he discusses the factors and the proper evaluation of the tests as they regard occupational exposures.
- 493 INDUSTRIAL DERMATITIS AND MELANOSIS DUE TO PHOTOSENSITIZATION. H. R. Foerster and L. Schwartz. Arch. Dermat. & Syphilol., 39, 32-42 (January 1939).
The authors examined 500 men in factories using pitch and tar products. Most of the cutaneous lesions observed were found in workers who handled pitch or pitch products and who were doing their work outdoors. Patch tests were performed on 14 pitch workers and 6 control subjects with the different fractions of the pitch and tar, and the areas thus tested were exposed to radiation of various wavelengths. Some of the aspects of the chemical and physical properties of the pitch are discussed in detail. From their studies, the authors conclude that pitch dermatitis and melanosis are the products of true photosensitization and not of allergic sensitization or predisposition. This photosensitization occurs through local exogenous activity of a specific photosensitizer. The tests revealed that no particular fraction of the pitch or distillate of the tar can be held responsible for the production of photosensitization. The most important radiation is that in the range of blue and violet or visible light and in the long wavelengths of ultraviolet light (3400 to 5000 angstroms). The most active carcinogenic hydrocarbon in pitch, namely, 1,2 benzopyrene, which has fluorescent bands at 2500 and 3800 Angstroms, is probably not one of the photosensitizing ingredients.
- 494 OIL DERMATITIS. Anonymous. Safety Eng., 77, 49-50, (May 1939).
The article reports on some researches carried out on dermatitis from cutting oils, about which the following conclusions are drawn. The oil itself is not the direct cause of the skin irritation; rather it is the dust and bacteria for which the oil forms a suitable vehicle. The bacteria are not from the oil, but are on the skin; all cutting oils are capable of penetrating the skin surfaces and the bacteria enter by this means. These bacteria also find entry to the skin through minute cuts made by metallic particles in suspension in the oils. Prevention is best accomplished by thorough cleanliness. The affected parts should be washed twice a day in soap and water and no oils or gasoline should be used to remove dirt.
- 495 ALKALI ECZEMA, ITS DEVELOPMENT AND PREVENTION, WITH SPECIAL REFERENCE TO MODERN SOAPS (PRACUTAN, SATINA). H.T.Schreus. Med. Welt., 13, 222-5, (1939). (German).
The author considers that usually in hypersensitivity to alkalis, no real allergic hypersensitivity is present, but an immediate sensitivity brought on by chemical and physico-chemical reactions. Only prolonged contacts are invariably effective. Since alkali eczemas are only exacerbated by alkaline soaps, special alkali-free soaps such as "Pracutan" are recommended.

- 496 CHRONIC GRANULOMA IN INDUSTRIAL DERMATOLOGY. H. E. Miller. Arch. Dermat. & Syphilol., 39, 33-44 (January 1939).
In 3000 patients examined for the industrial responsibility of their eruption the author found 26 with chronic granulomata of which 16 were syphilis, 9 were cutaneous tuberculosis, 1 blastomycosis, 1 actinomycosis, and 3 were leprosy. The role which each plays in these cases is discussed briefly. When chancres develop in the sites of industrial injuries, the carrier of insurance must provide treatment. The localization of lesions of secondary syphilis is rarely influenced by trauma, but the lesions of late and latent syphilis may often localize on the sites of injury and will therefore be important in the evaluation of industrial dermatoses. Miller warns physicians diagnosing and treating industrial dermatoses to be on the lookout for tuberculous chancres since he believes the incidence will rise in the future due to the definite decrease in early venereal infections now noted.
- 497 SOME CHIEF MEDICAL ASPECTS OF THE INDUSTRIAL DERMATOSES. S. F. Mott. Occup. Hazards & Safety, 1, 31-3 (May 1939).
Carefully planned medical records will provide a means for determining the incidence of various types of dermatoses and relate such indices to occupations or specific exposures. Pre-employment examinations can be made to afford an opportunity to classify the man as to reaction type and enable the physician to advise the job assignment. The author discusses some of the important practical points to consider in examining workers who are likely to be exposed to dermatosis-producing materials.
- 498 DERMATITIS FROM INDUSTRIAL CONTACT WITH NICOTINIC ACID. R. M. Watrous. J. Am. Med. Assoc., 112, 2132 (May 22, 1939).
Nicotinic acid has been reported as being a comparatively inert substance aside from its specific effect in curing pellagra. Patients have, however, noticed a sensation of warmth and flushing of the skin following oral or intravenous administration. In this short article, case histories are presented which indicate that nicotinic acid is capable of producing a transient dermatitis in certain persons working with nicotinic acid tablets during the course of their manufacture. In nearly all of the 4 cases presented, the affected parts of the skin had the appearance of a mild sunburn with a mild burning and itching sensation, and in all cases the condition subsided within a day or two. Only a small proportion of the workers experienced these reactions.
- 499 ASEPTIC NECROSIS OF BONE. I. INFARCTION OF BONES IN CAISSON DISEASE RESULTING IN ENCAPSULATED AND CALCIFIED AREAS IN DIAPHYSES AND IN ARTERITIS DEFORMANS. S. C. Kahlstrom, C. C. Burton, and D. H. Phemister. Surg., Gyn., & Obst., 68, 129-46 (February 1939).
Caisson disease (compressed air disease) is the result of tissue injury caused by nitrogen which comes out of solution in the blood and body fluids in the form of bubbles following too rapid decompression after exposure to increased pressure. Because of the greater solubility of nitrogen in fats, body tissues with a high fat content are sites of predilection for bubble formation. The tendency for bubble formation to occur in the spinal cord, the nerves, and the subcutaneous tissue is thus explained and has often been described. However, with the exception of a single case, reported in 1888, there is no report on the pathological findings in the bones and joints in caisson disease. The present paper describes 4 cases of compressed air illness in which extensive bone and joint changes are found. The cases are unusually well presented, with complete case histories, x-ray and autopsy material, and illustrations. It is not improbable that as a result of the findings, bone and joint changes attributable to this disease will come to be regarded as a compensable occupational disease, and more attention will be paid to the prevention and early treatment of the condition.

References to Recent Literature - 16

- 500 COMPRESSED AIR DISEASE IN BUILDING THE REICH AUTO ROAD "HAVELBRUCKE-WERDER" AT THE SOUTHERN TANGENT OF THE BERLIN RING. R. König. Munch. med. Wchnschr., 86, 370-3 (1939). (German).
The author, as permanent medical supervisor of the compressed air work which reached a depth of 30 meters water gage, was always present during construction. He presents three interesting case histories and general data on the symptoms observed. It is of interest that in recompression, improvement took place at 2 to 3 meters water gage.
- 501 AERO-OTITIS MEDIA: ITS ALLEVIATION OR PREVENTION BY THE INHALATION OF HELIUM AND OXYGEN. W. R. Lovelace, C. W. Mayo and W. M. Boothby. Proc. Staff Meetings Mayo Clinic, 14, 91-6 (February 9, 1939).
Probably the most common subjective complaint of airplane pilots and passengers is discomfort in the ears during descent in flight. This is due to the peculiarity of the Eustachian tube which causes it to tend to remain collapsed unless frequent voluntary swallowing efforts or other measures are employed to open it during descent for the purpose of equalizing pressure in the middle ear. It has been discovered by experiment that helium-oxygen mixtures prevent or greatly diminish this discomfort and it is suggested that, in airplanes equipped with inhalation apparatus, helium-oxygen mixtures be inhaled during marked changes in altitude, especially when descending.
- 502 INDIVIDUAL VARIATIONS IN ABILITY TO ACCLIMATE TO HIGH ALTITUDE. A. Keys, B.H. W. Matthews, W. H. Forbes and R. A. McDonald. Proc. Roy. Soc., 126, Series B, 1-24 (September 1938). (British).
Individuals differ markedly in their ability to adjust to the rarefied air of high altitude, and this ability appears to be related to a number of measurable characteristics at sea-level. For relatively normal men between the ages of 29 and 44, habituated to sea-level, it appears that youth, slow pulse, low-normal blood oxygen capacity, low alveolar-oxygen pressure, high alveolar-carbon dioxide pressure and high alkaline reserve at sea-level are favorable for acclimatization at high altitude. It is concluded that careful observation over a number of days by trained observers gives a better indication as to relative perfection of acclimatization than any laboratory measures yet devised.
- 503 A CONTRIBUTION TO THE MECHANISM OF ADAPTATION OF THE ORGANISM TO HIGH TEMPERATURE. S. P. Sharovtova. Bull. Biol. et Med. exp., U.S.S.R., 6, 671-4, (1938). (Russian).
Single or repetitive exposure of dogs to heat (50°C) decreased gastric secretion in response to a particular food stimulus, and increased the organic components of the juice; the inorganic components remained practically unchanged. The observed changes indicate the participation of both the nerve-reflex and neuro-chemical regulating systems.
- 504 HEAT STROKE AND ALLIED CONDITIONS. T. B. Nicholls. J. Roy. Army Med. Corp., 72, 73-84 (February 1939). (British).
A review of the subject, written especially for army men in the tropics. The use of salt in the author's group reduced heat stroke to zero.
- 505 OBSERVATIONS ON THE BLOOD OF WORKMEN EXPOSED TO HIGH TEMPERATURES. P.L. McLain and E.S. Montgomery. J. Clin. Invest., 17, 417-22 (1938).
Observations on a control group of 43 workers in hot industries and 30 patients admitted to a hospital for heat symptoms. In the latter group there were 17 cases of heat cramps, 6 of heat exhaustion and 7 of heat retention ("stroke"). Careful blood tests were made; in the controls there was dehydration and fall of blood sugar following work; in the patients, the changes depended on the type of heat ailment involved.

References to Recent Literature - 17

- 506 HEATING AND VENTILATING SYSTEMS FOR PHYSICAL COMFORT. A. Hindley. J. Inst. Heat. & Vent. Engrs. London., 7, 36-42 (March 1939). (British).
In this short paper the author gives a sound and interesting discussion of heating and ventilating systems in relation to human comfort. He regards as the main essentials (for sedentary workers in Great Britain), a temperature of 64° to 68°F.; a moderate relative humidity, clean air, and adequate air movement; he later refers to the desirability of variable air currents rather than a uniform and monotonous rate of movement. The author concludes that, in Great Britain, except for certain industrial purposes, air conditioning is overrated, and that the air washer and refrigerator could be dispensed with, substituting for ventilating purposes only a larger volume of fresh air and making provision for increased air movement to be used as required.
- 507 PROTECTION AGAINST EYE ACCIDENTS. Home Office, Factory Department, June 1937, December 1938. (British).
Over 7600 eye accidents were reported to the Factory Inspectorate in Great Britain during 1936. As the accidents reported are probably only those causing disablement for 3 days or more, the total number of eye accidents is not known but this number is probably in the neighborhood of 100,000 yearly. The leaflet deals with methods of preventing such accidents. Screens (fixed and portable), helmets, face masks, visors, veils and goggles, are referred to, and the requirements for various operations are mentioned. Cautions as to the maintenance of protective appliances are given.
- 508 CHEMICAL MUSCLE CHANGES INDUCED BY ELECTRIC TRAUMA. G. Montemartini. Folia med., 17, 76-86 (1939). (Italian).
In animals experimentally shocked or killed with an electric current, the author finds demineralization, reduction of glycogen and alteration in calcium, magnesium, and potassium values. These values return to normal, however, some time after the end of exposure to electricity.
- 509 THE IGNITION OF FIREDAMP BY PYRITES DURING COAL CUTTING. G. Allsop and R. V. Wheeler. Trans. Instn. Min. Engrs. Lond., 96, 310-2 (February 1939). (British).
Experiments have clearly established that methane-air mixtures can easily be ignited by the rubbing of blunt picks or of pick-boxes against pyrites, and it is thought that the mechanism of the ignition is as follows. Under the rubbing action, some of the pyrite is reduced to a fine powder and heated to between 200° and 300°C. Within this range of temperature, oxidation of the powdered pyrite proceeds rapidly and ultimately flame (burning sulfur) appears. This flame ignites the firedamp.
- 510 DOCUMENTS OF OCCUPATIONAL ANTHRAX. Med. du travail, 31, 46-66 (1939). (French).
French rules regarding compensation of anthrax as an occupational disease and its former compensation as an accident, are reproduced and discussed. Instructions for the prevention of the disease are also included. One author reports on two cases treated with serum and with fomentations of septonil (paraminophenyl-sulfamid). He also mentions eight other cases treated by Murteanu and Zeltzman with other sulfamids.
- 511 PROPHYLAXIS OF MINERS' ANKYLOSTOMIASIS IN THE LOIRE VALLEY. C. Garin and E. Roman. Ann. d'hyg. pub. ind. soc., pp. 56-66 (February 1939). (French).
In France, miners' ankylostomiasis (also called miners' anemia or tunnel anemia) is a compensable disease. It can be prevented by keeping the mines as free as possible of worm larvae and by examining and treating the workers. An intensive

effort was made in two mines employing 4900 men. The percentage of infested men, varying widely from pit to pit, was found to range from 16% to 65%. Of the infested workers treated with tetrachlorethylene, 80% were entirely freed of parasites; chenopodium oil and thymol were not more than 50% effective and quinacrine was useless. Final examination showed the infestation to have dropped markedly in all groups although it had not been completely wiped out.

- 512 WEIL'S DISEASE IN COAL MINERS. W. E. Boes. Brit. Med. J., pp. 603-5 (March 25, 1939). II. CLINICAL PATHOLOGY. A. P. Sladden. Ibid. pp. 605-7. (British). The prevalence of Weil's disease is further shown by the six cases reported here among South Wales coal miners. The symptoms were typical; jaundice, nephritis and sudden onset of generalized muscular pains. One of the cases was fatal. The diagnosis was verified in each case by serological investigation and positive agglutination reaction for leptospira. Laboratory investigations are set out in tables containing details of blood examinations, blood counts, urine examinations, tests for red cell fragility, Wassermann reactions, animal inoculation experiments, Van den Burg reactions, and the presence of urine bilirubin, urobilinogen and urobilin. Three of the men worked together and all worked in wet places infested with rats. Steps are being taken to rid the mines of rats, as no further cases have occurred in mines having done so.

- 513 SPIROCHETAL JAUNDICE IN BUFFALO, NEW YORK. REPORT OF A FATAL CASE IN A FISH MERCHANT. N. W. Hizon. Am. J. Clin. Path., 9, 219-25 (March 1939). This is said to be the eighth proven death from Weil's disease (see Abstract 433, 1939) in this country. Its course is described along with very careful laboratory tests. Urine obtained on the patient's admittance to the hospital was injected into a guinea pig which developed jaundice on the 12th day and died within 24 hrs. On sectioning, its liver was seen to be swarming with typical leptospirae, which were spread uniformly over the liver and were abundant in the tubular epithelium. A second guinea pig, inoculated with the urine of the first, also died. Microscopically no spirochetes were visible in the patient's urine or in the guinea pigs' blood or urine.

- 514 FACTORS INFLUENCING SUSCEPTIBILITY OF PLANTS TO SULPHUR DIOXIDE INJURY. Carl Getherstrom and P. W. Zimmerman. Contrib. Boyce Thompson Institute. 10, 155-161 (January-March 1939). From a review of the literature and new experimental data the knowledge of the action of sulphur dioxide on plants has been increased. Some of the conclusions made are as follows: (1) plants are more resistant to sulphur dioxide at temperatures below 40°F.; (2) resistance generally decreases with an increase in the relative humidity, (3) plants grown with an ample supply of water are more susceptible than those with an inadequate supply, (4) plants grown in poor soil are more susceptible than plants in good soil, (5) reduction in light intensity (as a heavy shade) below 35% decreases the resistance, and (6) young plants are more resistant than older ones. A second paper on the subject is to follow at a later date.



FOUNDATION FACTS

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

Vol. I.

EXHIBIT

September, 1939

PLAINTIFF'S
EXHIBIT

No. 2

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Are You Missing Any Bets?

WH-118

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

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

"Why they're exactly what I wanted!"

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

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

Plans Progressing for Annual Meeting

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

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

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