AIR HYGIENE FOUNDATION OF AMERICA, INC. 1935

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. 1 August, 1939 No. 1

RECEIVED AUG 14 1939 Patent Office

This is the first issue of "Foundation Facts," a monthly news letter to members of Air Hygiene Foundation reporting news of the organization. Please relay the letter to other interested officials in your organization. Suggestions are welcome.

Annual Meeting Set for Nov. 14-15

The annual meeting of Air Hygiene Foundation expanded to two days this year, will be held at Mellon Institute, Pittsburgh, on Nov. 14-15. This has been a one-day session in the past but the wealth of information available forces an expansion this year. The program, while bristling with important medical and engineering data, will also cater to management's interest in industrial health. Besides the medical and engineering aspects of the subject, there will be a symposium on absenteeism, a report on legal developments during the year, and a forum on what industrial health means to industrial and public relations. Please call the meeting to the attention of your company associates and plan now to attend. More details later.

New Trustees Named

Andrew Fletcher, Vice President, St. Joseph Lead Company, was elected Vice Chairman of the Board of Air Hygiene Foundation at the Trustees' Spring meeting. J. Dewey Dorsett of the Association of Casualty and Surety Executives was elected to the Board, replacing Henry Sayer, now with the New York State Insurance Fund. R. E. Zimmerman, Vice President, U. S. Steel Corporation, was named a trustee, replacing H. A. Schultz, resigned.

C. E. Ralston Heads New Membership Committee

C. E. Ralston, Safety Director, Pittsburgh Plate Glass Company, has been appointed Chairman of the Foundation's Membership Committee, replacing H. T. Herr,Jr., President, J. S. McCormick Company, resigned. Mr. Ralston has selected the following committee to assist in interesting companies in affiliating with the Foundation:

F. H. Atwood, Harbison-Walker Refractories Co., Pittsburgh; Alex D. Bailey, Commonwealth Edison Co., Chicago; Earl F. Blank, Jones & Laughlin Steel Corp., Pittsburgh; Dr. A. G. Cranch, Union Carbide Co., New York; Walter H. Emerson, Homer Laughlin China Co., Newell, W. Va.; F. C. Frary, Aluminum Co. of America, New Kensington, Pa.; E. V. Gent, American Zinc Institute, New York; C. F. Goodwin, U. S. Potters Association, East Liverpool, Ohio; Harry B. Lindsay, Grinding Wheel Manufacturers Association, Worcester, Mass.; R. T. Pring, Utah Copper Co., Salt Lake City; and J. T. Ryan, Mine Safety Appliances Co., Pittsburgh.

New Information Circular Issued

The Foundation has just issued a new Information Circular (No. 5) which is available to members. It lists officers, committees, members and services.

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Industrial Hygiene Digest, 1939, August 1939 (Vol. 3, No. 8)
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Air Hygiene Foundation of America, Inc.,
4400 Fifth Avenue,
Pittsburgh, Pa.
August 9, 1939.

REFERENCES TO RECENT LITERATURE ON INDUSTRIAL DISEASES

(A) News Items

573 INDUSTRIAL HYGIENISTS FORM NEW ASSOCIATION. A. C. Carruthers. Safety Eng. 78, 33-4 (July 1939).
A new organization, The American Industrial Hygiene Association, was organized at the Cleveland meeting of the American Conference on Occupational Diseases and Industrial Hygiene, June 5-8, 1939. The purposes of the new group are to effect a permanent organization of industrial hygienists and to constitute a clearing house of information on the progress which is being made in the field of industrial hygiene. A tentative constitution for the Association was passed and the following officers elected: President, W. P. Yant; President-elect, W. A. Cook; and Secretary-Treasurer, G. C.Harrold. The board of directors includes many eminent authorities in the field. Three classes of membership will be established: senior members, associate members and members. It is planned to establish local chapters in important cities to hold meetings and to promote the subject generally. Further information may be obtained from the Secretary, Gordon C. Harrold, Industrial Hygiene Laboratories, 7900 Jos. Campau Ave., Detroit, Michigan.

574 DR. CLARENCE O. SAPPINGTON RECEIVES KNUDSEN AWARD.
The annual Knudsen Award for the most outstanding contribution to industrial medicine in the last year was awarded to Dr. Sappington at the Cleveland meeting of the American Association of Industrial Physicians and Surgeons. The presentation - the first of its kind - was made to Dr. Sappington for his authorship of the book "Medicolegal Phases of Occupational Diseases," reviewed in our July Abstract Bulletin.

575 AMERICAN STANDARDS ASSOCIATION COMMITTEE DRAFTS FIRST STANDARDS TO LIMIT TOXIC DUSTS AND GASES. Industrial Standardization, 10, 187-8 (July 1939).
The newly organized Committee met on June 30, 1939, and made drafts of four standards on toxic gases. The four standards cover carbon monoxide, benzene, hydrogen sulphide and carbon disulphide and they are now in the process of adoption by the Association membership. At their meeting the Committee discussed standards for silica dusts, lead in all forms, and hydrocarbon compounds, and it is probable that the work will be extended to cover these materials in the near future. The adoption of these rules will for the first time make available nationally approved and generally accepted standards defining the allowable limits of toxic dusts and gases. Publications of the four new codes will be noted, as they appear, in these Abstracts.

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

576 ADMINISTRATION OF LAWS FOR THE PREVENTION AND CONTROL OF OCCUPATIONAL DISEASES. Theo. C. Waters. Am. J. Pub. Health, 29, 728-37 (July 1939).
Occupational disease compensation laws are the result of a definite economic need to afford injured employees adequate compensation for injuries they have sustained during the course of their employment. Industrialists today accept the obligation imposed upon industry to provide compensation whether arising out of accidental or occupational disease means; the additional cost does not appear to have placed an unjust burden upon industry. It is to be hoped that employers as a group will cooperate in the administration of occupational disease laws, inasmuch as there are bound to be difficulties arise in the administration of comparatively new statutes containing inherent defects. Two phases of the administrative provisions are discussed: provisions for the creation of medical Boards and provisions for the establishment of Bureaus of Industrial Hygiene. The first are nonpartisan agencies to determine physical disability and the second have the duties of maintaining a reporting system, establishing rules and codes, and of maintaining an industrial inspection service. Commenting on the latter, it is stated that the cost of prevention is but a small part of potential liability imposed by law for compensation.

577 INDUSTRIAL HYGIENE CODES. J. R. Allen. Am. J. Pub. Health, 29, 748-51 (July 1939).
Unlike safety codes, industrial hygiene codes contain provisions not always obvious or understandable by the average layman and their formulation and enforcement are much more difficult. The experience of the foundry industry in developing its excellent code for control of occupational diseases is described. The advantage of codes made by and applying to one industry are that they are based on experience, they are specific for that industry, they have better cooperation from manufacturers of equipment, and they can be easily amended or changed if found inadequate. State codes when included in laws enacted by legislatures are difficult to change when found inadequate and also cover too many conditions to be properly applicable to specific industries. State codes when formulated by supervising bodies can be more readily changed and function with greater efficiency. It is proposed that separate industries or trades formulate their own codes as the best means for controlling occupational disease and for reducing compensation costs.

578 ANTHRA-SILICOSIS AND BRONCHIAL CARCINOMA WITH QUIESCENT TUBERCULOSIS. J. E. Lovelock. Brit. Med. J., pp. 8-11 (July 1, 1939). (British).
The increasing incidence of bronchial carcinoma is a recognized fact and recent statistical surveys suggest that the increase is real and not merely an apparent one due to improved facilities for observation and more accurate diagnosis. On the other hand many authorities consider that the matter is still undetermined. A case is presented of a coal miner who died of anthra-silicosis and bronchial carcinoma. Full post-mortem findings are given. The coroner certified the case as a combination of carcinoma and silicosis due to occupation. Compensation has to date been refused because of a lack of legal status between the two but a final decision has not yet been reached. The greatest drawback to medical recognition is the difficulty of diagnosis during life. The clinical, pathological, radiological and medico-legal phazes of the condition are discussed and it is noted that the question of silicosis and carcinoma needs further research and study.

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579 A REVIEW OF SILICOSIS AND DUST TESTING IN ONTARIO. G. C. Richards. Canadian Min. J., 60, 121-6 (March 1939). (Canadian).
The incidence of silicosis has been greatly reduced since dust control and proper ventilation have been given consideration. From 1926 to 1936 the average number of cases allowed (compensation) was 36 per year. The average of the 5 year period preceding 1937 was 18 per year. The average period of development of the cases changed from 10-11 years in the first period to 18 years during the latter, probably due to the result of preventive methods in reducing dust concentrations. Mine employers and employees have become more dust conscious and this fact together with the results of research on the problem have greatly reduced the hazard of silicosis in Ontario mines.

580 SILICOSIS AND TUBERCULOSIS. M. Conrozier and J. Magnin. Industrial Medicine, 8, 287-9 (July 1939).
This article is a continuation of the previous paper (see Abstract No. 261, April 1939), a translation by Dr. E. R. Hayhurst of the original article by the French authors. It discusses further the arguments of the two French schools of thought on the question of silicosis as a separate disease entity. The authors adhere to the belief that silicosis can exist in the absence of tuberculosis, a conclusion that has been accepted in all other parts of the world for many years.

581 THE FREQUENCY OF PULMONARY TUBERCULOSIS IN MINERS. L. Croizier and E. Martin. Bull. Acad. Med., 120, 42-9 (1938). (French).
After discussing the evidence for and against the view that miners are more susceptible to pulmonary tuberculosis than the non-mining population of the same ages, the authors, who are physicians in a mining area in France, state that for their district the mortality from pulmonary tuberculosis of the non-mining population aged over 15 years was 2.4 per thousand and of the mining population 3.2 per thousand. They name as possible causes: insufficient adaptation of rural immigrants to the urban conditions of the mining areas, alcohol and bad hygienic conditions, and the defective conditions in the mines themselves. They advocate a more rigorous medical supervision of miners with systematic x-ray examinations, these examinations to extend to other members of the miners' families who may be contacts.

582 INDUSTRIAL INCAPACITY AND MODERN MEDICINE. D. Stewart. Brit. Med. J. pp. 963-7, (May 13, 1939); 1019-23 (May 20, 1939). (British).
A plea is made for greater extension of medical service in industrial plants, large and small. Such services have proven to be good investments, and not philanthropic institutions. The preservation of the health of the worker is as important as the maintenance of the machine. There is great need for a more thorough knowledge and understanding of industrial health problems by physicians so that they may be of maximum benefit to industry.

583 DISCUSSION OF INDUSTRIAL ACCIDENTS AND DISEASES. REPORT OF 1938 CONVENTION. International Assoc. Industrial Accident Boards and Commissions. U.S. Dept. of Labor, Divn. of Labor Standards, Bulletin No. 24, 204 pp. (1939). Obtainable from Supt. of Documents, Washington, D. C., for 30 cents.
This bulletin reports in detail on the proceedings of the Convention held in September 1938. Most important among the topics covered are: the use and desirability of state funds for compensation; legal fees in compensation awards; effectiveness of safety conferences; compulsory compensation insurance; and other phases of the subject in general.

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584 INDUSTRIAL HEALTH SURVEYS. Northwestern University Medical School, Dept. of Industrial Medicine, Bulletin No. 7, 12 pp. (February 1939). Copies obtainable from the Department, Evanston, Illinois; for 50 cents.
The bulletin discusses health surveys in general, outlines the order of procedure, and gives typical examples of records to be kept. Large plants have in their organizations men sufficiently trained for the work but this is not true in most of the smaller plants. Consultation service is sometimes necessary and advantageous in supplementing these surveys in the small plants. This bulletin serves as a guide to those interested in the subject.

585 ABC's OF INDUSTRIAL DUST CONTROL. Roy P. Warren. Occup. Hazards and Safety, 1, 8-10 (July 1939).
Larger industrial establishments have for years recognized the value of dust control but many more smaller plants have not heretofore realized that dust control systems pay for themselves in worker health and efficiency, in decreased maintenance costs, in production efficiency and in better finished products. The purpose of this and succeeding papers by the author is to present the basic principles of dust control and suggestions for smaller plants to guide them in installing efficient and economical dust control systems. Two tables are given illustrating the size of particles encountered in industrial dusts ranging from 0.2 microns (tobacco smoke an example) to 4000 microns (BB shot) and also the velocities necessary to collect and transport various materials. It is evident that each job must have proper individual treatment and a thorough knowledge of air movement and control is the first essential. An example of plant survey form containing the essential data for a dust survey is included with the paper.

586 THE COMPOSITION OF STONE AND OF INHALED DUST IN RELATION TO SILICOSIS. A. Shaw. Colliery Guardian, 158, 522-4 (1939). (British).
The prevalence of silicosis among workers in the several mines in England is discussed in relation to the character of the inhaled dust. Silicosis cases among tin miners, gold miners, barite miners, and coal miners of Somerset, North Staffs, and part of the steam coal area of South Wales is almost invariably associated with long periods of work in rock containing 50-80% of free silica. The many cases certified among South Wales anthracite workers exposed only to coal dust containing no more than 10% free silica are not believed to be silicosis but rather a bronchitis.

587 THE EFFECT OF ALUMINUM ON SOLUTION OF MINE DUST. S. R. Rabson. Bull. Inst. Mining & Met. No. 415, 4 pp. (1939). (British).
The addition of finely divided aluminum powder to mine dusts lowers the initial rate of solution in water, but does not materially affect the ultimate solubility of the dusts. It is stated that since this is true, the value of aluminum as a preventive of silicosis is not yet established.

588 BUREAU OF MINES MIDGET IMPINGER. H. H. Schrenk and F. L. Feicht. U. S. Bureau of Mines, Information Circular No. 7076, 7 pp. (June 1939).
Previous papers describing the midget impinger are out of print and this circular has been written to combine the material and to make it available for distribution. The equipment, its design and use are described at length in the circular, and results of a series of tests on certain dusts are included. The circular contains nothing new regarding the midget impinger that has not been included in the former publications (these Abstracts, No. 108 (1937); No. 342 (1938); No. 578 (1938).

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589 ON THE EFFECT OF GRINDING ON THE SOLUBILITY OF MINERAL SUBSTANCES, AND ON THE TOXIC CHARACTER OF THE RESULTING DUSTS. M. W. Travers. Chem. & Ind., 58, 226 (March 11, 1939). (British).
A short note by the author remarks about one or two facts that were brought to his attention following a review of the literature on silicosis but which have apparently been unnoticed heretofore. A study by Ray (1923) showed that the solubility of mechanically ground silica was markedly higher than that of crystalline silica and the fact may go far to account for the poisonous character of mechanically produced dusts. It is suggested that the microcrystalline material present in the lung, which is probably silica, is separated from the lung fluids already saturated with mechanically transformed silica. The presence of the microcrystalline material may have no connection with the toxic property of the silica.

590 ELEMENTARY MECHANISMS OF MINERAL PNEUMOCONIOSES. ACTION OF PERMUTITE ON PULMONARY TISSUE. A. Policard. Bull. hist. appl. phys. tech. microscop., 16, 18-31 (1939). (French).
White rats were exposed to commercial permutite dust (2000 particles per cc.) 3 hours daily for 7 days. This produced no gross symptoms other than an increase in flow of nasal mucous during the exposure period. Later, however, a histological study of the lungs revealed the presence of permutite in the alveoli and the occurrence of marked peculiar cytological reactions to this reagent. These included partial atelectasis, hypertrophy of the alveolar cells, and changes in the cell content of the intra alveolar exudate. The author suggests that the permutite may exert its characteristic base-exchange reactions within the lung, and that these may be responsible for the disturbances produced by the inhalation of this mineral.

591 PRELIMINARY NOTE ON PUMICE DUST. A. R. Smith and J. Siegel. Industrial Bulletin, New York Dept. of Labor, 18, 285 (June 1939).
Pumice is a volcanic substance, a glassy cellular lava which has cooled so quickly that little if any of the minerals have separated out as individual minerals. Most of the world's pumice comes from Lipari, an Italian possession, and is used as an abrasive in grinding and polishing. Pumice contains little free silica (1 to 5%) and the effect of breathing its dust comes up for discussion from time to time. Only one reference to pumice exposure was found in the literature. In 1932 almost all of 100 workers in Lipari exposed to apparently severe dust concentrations, were found to have pneumoconiosis in the various stages. In this country an examination of 30 men engaged in grinding and packing pumice dust, revealed that 4 showed increased fibrosis and that 2 had silicosis. The past histories of these two men showed no serious silica exposure other than the pumice dust, and it is therefore concluded that the pumice was at least a contributing cause in the two cases of silicosis.

592 A NEW METHOD OF EVALUATING THE EFFECTS OF NATURAL AGENCIES ON THE VENTILATION OF MINES. F. B. Hinsley. Trans. Instn. Min. Engrs. London 97, 131-51 (April 1939). (British).
An extensive and detailed discussion is presented on the effect of natural agencies on ventilation in mines. Mine workings usually constitute a huge reservoir of heat as evidenced by an almost constant temperature of return air regardless of the amount of air passing per minute. The greater the airflow the greater is the energy derived from natural sources. Leakage, especially near the pit bottoms and resistance to flow are the two most important items which prevent greatest utilization of natural ventilation.

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593 AIR FILTER PERFORMANCE AS AFFECTED BY LOW RATE OF DUST FEED, VARIOUS TYPES OF CARBON, AND DUST PARTICLE SIZE AND DENSITY. F. B. Rowley and R. C. Jordan. Heating, Piping & Air Cond., Journal Section, 11, 388-98 (June 1939).
A continuation of the researches of the authors (see Abstract 738, 1938). The tests made were to determine possible improvements in the ASHVE Test Code and not to compare the different commercial filters used. In rating a filter, high rates of feed give results comparable to low rates of feed and it is recommended that the more practicable (in testing) higher feeds be used. It was found that lampblack and carbon black, which resemble soot closely, differ greatly in properties even though the dust appears to be of uniform specification and it is recommended that further efforts be made to standardize on a carbon for the tests. It was stated that dust density (specific gravity) has an important bearing on filter capacity ratings. The present code (50% lampblack and 50% ash) penalizes most filters by a too severe test; other products give performances better than actual practice and it is recommended that a standard be made up of components of the two extremes.

594 RELATIVE AIR DUSTINESS DURING CYCLE OF OPERATIONS AT MOUNT WEATHER TESTING ADIT. J. A. Johnson and W. G. Agnew. U. S. Bur. of Mines, Report of Investigations No. 3453, 7 pp. (June 1939).
Impinger dust counts were taken during an entire cycle of operations at the Mount Weather testing adit. The counts showed very high concentrations (3,300 m.p.p.c.f. in these tests) after blasting and it seems reasonable to assume that essentially the same conditions would prevail in most metal mines during similar operations. Because it is common practice to ventilate several working places with the same air, a number of men may be exposed to the dust from a blast where blasting is permitted during the shift, unless suitable means are taken to control air circulation. Some metal mines permit blasting only when the shift is going off, which is good practice, but enough time should be allowed for dust and gas to clear before a new shift resumes. Other tests have shown that the concentration of dust from blasting can be reduced 99 per cent by using compressed-air water spray near the face and it is planned to expand the present tests to determine the best means of utilizing this type of spray.

595 MAIN FAN INSTALLATIONS AT METAL MINES. Mine Safety Board, U. S. Bureau of Mines Information Circular No. 7078, 2 pp. (June 1939).
In the interest of safety in metal mining, the Bureau recommends: "That underground metal mines be equipped with a main fan in a fireproof housing, located preferably at the surface. The fan installation should be designed to ventilate the mine adequately throughout and to permit prompt reversal of direction of air flow." Many metal mines rely on natural ventilation or on inadequate compressed-air supplies, but only mechanical forced draft systems are dependable under all conditions.

596 WHAT IS THE RESPONSIBILITY OF THE COAL-MINE OFFICIAL IN THE PRESENT CHANGE TO AND FUTURE OF MECHANIZED MINING? D. Harrington. U. S. Bureau of Mines, Information Circular No. 7081, 13 pp. (June 1939).
Mechanization of mines may ultimately reduce accident rates, although the opposite effect is sometimes produced during early periods following introduction. The ultimate reduction will follow the realization on the part of mine operators that, while old hazards may be eliminated, new ones with different methods of attack are presented by the introduction of machinery into confined, poorly lighted locations.

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597 THE FLOW OF AIR AND ITS DISTRIBUTION THROUGH DUCTS. PART 6, FAN LAWS AND FAN SELECTION. J. R. Zwickl. Heat. & Vent. 36, 64-6 (July 1939).
The three fundamental fan laws are: (1) the pressure produced by the fan varies as the square of the fan speed, directly as the air density; (2) the flow through a fan varies linearly as the fan speed; and (3) the fan horsepower varies as the third power of the fan speed and directly as the density. In the selection of a fan, which must deliver a specified amount of air against a certain static head, it is important to take temperature and pressure into account. The article contains directions for fan selection from manufacturer's tables which give the fan speeds necessary to develop a given static suction when handling a specified air volume.

598 INDUSTRIAL IMPAIRMENT OF HEALTH AND POISONING IN THE METAL-WORKING INDUSTRY. Freitag. Oberflachentech. 16, 35-6 (1939). (German).
The danger of silicosis in men working with sandblasting; poisoning by nitrous gases in pickling, etching and coloring processes; by chromium salts in chromium plating; lead poisoning in lead welding; carbon monoxide poisoning in oxy-acetylene welding and by toxic gases developed in nitriding and other hardening processes are discussed at length.

599 ACTION OF VARIOUS MINERAL DUSTS ON CONJUNCTIVE TISSUE SUPPLIED WITH THE AID OF THE CORNEAL BIOMICROSCOPE. A. Policard and J. Rollet. Compt. rend. soc. biol. 130, 954-7 (1939). (French).
Very small amounts of finely powdered minerals were introduced into rabbit corneas. Quartz, opal, diatomaceous earth, permutite and cobalt arsenide produced a white opaque spot which showed no diminution after 5 weeks. Sahara sand and fuller's earth produced less marked reactions. Muscovite and sericite produced slight reactions that cleared up in 4 weeks. Low-ash coal dust produced no reaction.

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

600 INDUSTRIAL FATIGUE AND THE PHYSIOLOGY OF MAN AT WORK. D. B. Dill. Industrial Medicine, 8, 315-8 (July 1939).
The author's discussion centers around the physiological principles of man at work in the office or mill during which there is a transfer of chemical energy to mechanical energy and heat. Most of the chemical energy supplied to the body is required to maintain life and the mechanical efficiency of the body is remarkably low, probably about 10% for a 24 hour period. It has been found that carbohydrates are more efficiently utilized by the body than fats and experiments with animals or human subjects demonstrates that fatigue sets in more rapidly following a low carbohydrate diet. Glucose is one of the more readily digestible forms of carbohydrate; successful use of it has been had in certain industries. Regarding heat stroke, heat cramps and prostration, it is now a proven fact that the condition is partly dependent upon the amount of salt in the diet and the use of salt tablets in industry is increasing rapidly. It has been suggested that the use of gelatine, by increasing the store of creatine in the body, reduces fatigue and continued work on the latter subject will be carried out for confirmation.

601 WORKING CAPACITY AND DIET. E. H. Christensen. Skand. Arch. Physiol. 81, 160-71 (1939). (Skandinavian).
The capacity for severe exercise in well-trained subjects is two to three times as great after a carbohydrate-rich diet (90% of the calories derived from the carbohydrates) than after a fat-rich diet (5% of the calories derived from carbohydrates); 3500-5000 calories were given daily in each case. The protein content of the diet was small. The diminished capacity for exercise on a fat diet is attributed to the low blood-sugar level and the ketonaemia.

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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 physidogical 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, chlorex, 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, 382-91 (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 benzine, 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, 392-408 (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 benzine, 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 bacteriacidal 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. Weedon, Albert Hartzell and Carl Setterstrom. 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 seloniferous 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. Theo. Hatch. Industrial Bulletin, New York Dept. of Labor, 18, 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 existance 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.

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