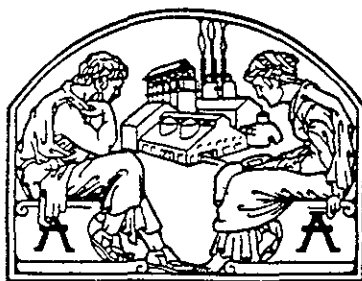


IN RE: ABRAMS
November 1992



HW88-0018094

Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL ... decisions and trends

JULY, 1958
(Vol. 22, No. 7)

INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE - PITTSBURGH 13, PA.

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IN THE AIR/AMIS November 1992

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FOUNDATION FACTS

Foundation Facts is a monthly newsletter issued to industrial concerns holding memberships in Industrial Hygiene Foundation. The Foundation is a nonprofit association of industries for the advancement of healthful working conditions.

Volume 10

July, 1958

No. 7

I-H-F ENGAGED IN BROAD RANGE OF SURVEY AND RESEARCH PROJECTS

Health maintenance in industry takes no vacation. During these summer months the Foundation is engaged in a continuing study of industrial health problems for its member companies. Studies currently in progress cover a wide variety of manufacturing operations and represent a cross-section of American industry. Likewise they run the gamut of industrial health problems. Included are two major air pollution studies, a noise survey, two plant-wide environmental studies, several long-range biological and toxicological research investigations and range-finding studies.

A review of hygiene measures proposed in rehabilitating a plant of a chemical company is being made and engineering design of the new facilities recommended.

An environmental survey for an association of industries is under way in which both air pollution and noise are being studied at six representative plants.

Study involving the over-all evaluation of the air pollution problem as it relates to member companies of an association of industries is under way. The first step is a critical review of existing data and information concerning the companies involved. The second step is inspection of a cross-section of the plants; third, a review of air pollution laws to ascertain the requirements which industrial operations should be prepared to meet in the different communities; and fourth, recommendations regarding the need for present and future control, community relations and research activities.

A study to measure the degree of dust exposures at a plant of a glass company indicated that acceptable dust concentrations were found in all areas studied. The report includes recommendations for continued good operation.

Several environmental studies made for a member company covering the past 12 years are being reviewed for the purpose of defense against litigation. The company's counsel feels that this analysis will provide him with invaluable information to refute the claims against the company.

The toxicological laboratory is winding up two long-range research investigations and several new projects have been initiated. An 18-month study of biological factors in air pollution for the American Iron and Steel Institute is essentially completed. The effects of solid respirable constituents of stack effluents upon the lungs of animals was studied. The specific object of the study was to investigate a possible mechanism of the deaths that occur during episodes of atmospheric inversion.

Nearing completion is a 30-month investigation of the potential health hazards of a new product of a member company. Effects on the lungs, on the gastrointestinal tract, and on the eyes of experimental animals were studied.

A research program on the pathogenesis of experimental tuberculo-silicosis is being conducted in the Foundation's toxicological laboratory for the National Institutes of Health, United States Public Health Service. The specific aim is to study the character of the pulmonary inflammation produced by the intratracheal injection of a combination of silica with both living and dead tubercle bacilli and with tuberculin, and to compare with the inflammatory reaction produced when these various agents are injected separately into lungs.

The pilot stages of an investigation of the cancer-producing potential of certain chemicals or mixtures have been completed. The new technique developed in the toxicology laboratory for applying the test substance directly on the bronchial tissues of animals is being utilized in this project.

From the viewpoint of comprehensive evaluation of exposure hazards, long term chronic studies are required. However, acute toxicity studies provide useful information in a short period of time and also indicate whether long-term chronic experiments are needed. Several such studies are currently being conducted in the Foundation's toxicology laboratory for member companies.

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INDUSTRIAL HYGIENE FEATURES

No correlation found between eye irritation and oxidant values in study of effects from solar radiation of organic compounds. Abstract No. 808.

The industrial physician practices a broad specialty rather than a narrow one. Abstract No. 813.

Objectivity necessary for improving the medical evaluation of physical ability. Abstract No. 819.

Occupational physiology—a new branch of the study of man aimed at measuring human effort. Abstract No. 820.

Central agency to study current problems in the field of respiratory protection recommended. Abstract No. 830.

New developments in respiratory protection equipment, approval systems for devices and comparison of performance standards. Abstract Nos. 831-833.

An experimental study of the hazards of sodium-potassium alloy. Abstract No. 841.

Despite the large number of chemicals which enter into our daily diet, there is no imminent toxicological danger from food on the market today. Abstract No. 866.

Asbestos miners no more susceptible to lung cancer than comparable population unexposed to asbestos dust, study reveals. Abstract No. 883.

Effects of noise on speech intelligibility tested. Abstract Nos. 888-890.

A review of the health and safety programs and accomplishments in the atomic energy industry in the United States. Abstract No. 902.

The practice of respiratory protection at an atomic energy project. Abstract No. 904.

Radioactive particles in the air following nuclear detonations measured for a period of two months. Abstract No. 911.

A description of multi-cycle and long cycle automatic impinger sampling. Abstract No. 912.

A method for collecting gaseous samples of effluents from both cyclic and continuous industrial operations. Abstract No. 913.

A discussion of the relative value and applications of various ventilation methods. Abstract No. 919.

A joint report on the air over Louisville. Abstract No. 928.

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INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

796 Course in Air Pollution.

A two-week, full-time course in air pollution, designed for engineers, physicians, and industrial hygienists, will be given by the Institute of Industrial Medicine, New York University Post-Graduate Medical School, with the College of Engineering, December 1 through 12, 1958. The topics cover a wide range of features of air pollution and its control, including the relatively new and timely subjects of odor control, incinerators, and internal combustion engines. Visits to the New York Air Pollution Laboratory and the Brookhaven National Laboratory will be included. Tuition will be \$90.00. Applications and further information may be obtained from the Office of the Associate Dean, New York University Post-Graduate Medical School, 550 First Ave., New York 16, N. Y.

797 Courses in Radiological Health.

The Institute of Industrial Medicine, New York University Post-Graduate Medical School and the College of Engineering, in cooperation with the United States Atomic Energy Commission, offers four courses in radiological health the coming fall, winter, and spring. They include: Introduction to Radiological Health, January 5-16; Radiological Health Laboratory, January 19-30; Radiochemical Analysis, November 10-21; and Radiation Hygiene Measurements, May 4-29. Tuition for each of the first three courses will be \$90.00; for the fourth, \$180. The prerequisite is a bachelor's degree with college physics and chemistry. Graduate programs leading to advanced degrees can be arranged for qualified applicants. Applications and fuller information may be obtained from the Office of the Associate Dean, New York University Post-Graduate Medical School, 550 First Ave., New York 16, N. Y.

798 Hygienic Guide Series.

The following additional Hygienic Guides are now available: Lead and Its Inorganic Compounds; Ethylene Dibromide (1, 2 Dibromoethane); Methyl Bromide; Uranium (Natural); Silica (Amorphous); and Asbestos. They are given in the April AIHA Journal (pp. 154-162) and can be obtained from the American Industrial Hygiene Association, 14125 Prevost, Detroit 27, Mich., at 25 cents each.

799 Lectureship to Honor Dr. Selby.

The St. Clair County (Michigan) Medical Society has established an annual lectureship in honor of Dr. Clarence D. Selby, of Port Huron, who has retired as secretary of the medical society. Dr. Selby has had an active career in industrial medicine and has received several awards and citations.

-- J. Am. Med. Assn.

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OCCUPATIONAL DISEASE STATISTICS

800 Occupational Disease Statistics. (Cases reported to the respective Health Departments).

	<u>Colo.</u> <u>May</u>	<u>Conn.</u> <u>May</u>	<u>Tenn.</u> <u>May</u>	<u>Total</u>
Acids (rhinitis)		2		2
Asbestosis		1		1
Carbon tetrachloride (toxic hepatitis)			1	1
Dermatitis	21	44*	4	69
Ethylene trichloride (bronchial asthma)		1		1
Insecticides (unidentified)	1			1
Lead	1			1
Pneumoconiosis	2			2
Respiratory damage			1	1
Silicosis		4	1	5
Miscellaneous	<u>6</u>	<u> </u>	<u> </u>	<u>6</u>
Total	31	52	7	90

* Causes are listed as follows:

Oils, fats, and waxes, 11; infections, 6; poisonous plants, 4; dyes and inks, and rubber chemicals, 3 each; drugs, and synthetic resins and chemicals, 2 each; chlorinated hydrocarbons, medications, soap solutions, glue, etc., and solvents N. O. C., 1 each; and undetermined, 9 cases.

COMING EVENTS

- 801 Aug. 4-8 American Association for the Advancement of Science, Gordon Research Conference, Toxicology and Safety Evaluations, Meriden, N. H.
- Aug. 10-16 International Congress of Radiation Research, Burlington, Vt.
- Aug. 18-22 American Association for the Advancement of Science, Gordon Research Conference, Medicinal Chemistry, New London, N. H.
- Aug. 25-29 American Association for the Advancement of Science, Gordon Research Conference, Cancer, New London, N. H.
- Sept. 1-13 United Nations, Second Conference on the Peaceful Uses of Atomic Energy, Geneva, Switzerland.
- Sept. 4-5 American Society of Mechanical Engineers, Second International Conference on Air Pollution, New York, N. Y.
- Sept. 7-11 American College of Chest Physicians, Fifth International Congress on Disease of the Chest, Tokyo, Japan. (See news item in March Digest)
- Sept. 7-12 American Chemical Society, 134th National Meeting, Chicago, Ill.
- Sept. 8-14 Society of Industrial Chemistry, 31st International Conference, Brussels, Belgium.
- Sept. 15-19 Instrument Society of America, Annual Instrument-Automation Conference and Exhibit, Philadelphia, Pa.

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- Sept. 15-Nov. 7 New York University, Course in Occupational Medicine, New York, N. Y.
(See news item in May Digest)
- Sept. 22-23 Steel Founders' Society of America, Fall Meeting, Hot Springs, Va.
- Sept. 27-Oct. 3 American Roentgen Ray Society, Washington, D. C.
- Oct. 9-11 Optical Society of America, Annual Meeting, Detroit, Mich.
- Oct. 13-15 Association of Official Agricultural Chemists, Annual Meeting, Washington, D. C.
- Oct. 13-15 National Electronics Conference, Chicago, Ill.
- Oct. 20-22 American Oil Chemists Society, Fall Meeting, Chicago, Ill.
- Oct. 20-23 National Pest Control Association, 25th Annual Meeting, Washington, D. C.
- Oct. 20-24 National Safety Council, 46th National Safety Congress and Exposition, Chicago, Ill.
- Oct. 24-28 American Heart Association, San Francisco, Calif.
- Oct. 27-31 American Public Health Association, 86th Annual Meeting, St. Louis, Mo.
- Oct. 29-31 National Agricultural Chemicals Association, 25th Annual Meeting, Augusta, Ga.

LEGAL DEVELOPMENTS

802 New Legislation.

During the first half of 1958, maximum benefits for death and various categories of disability have been increased in Mississippi, New York, and Virginia. The occupational disease act of Virginia has been amended by (1) setting up a schedule of occupational diseases, (2) providing for employer's election to be bound by the schedule, and (3) amending the section relating to notice to employers in occupational disease cases.

-- Cond. from Workmen's Compensation Law Reports, Commerce Clearing House

803 Occupational Disease—Dupuytren's Contracture—Time of Disablement—Statute of Limitations.

An employee was properly awarded compensation for a disability resulting from his contracting Dupuytren's contracture arising out of his employment since he filed his claim within two years after he became disabled. In 1947 the claimant filed a claim for disability arising out of an accident which occurred in 1944. At that time, a medical examiner found the claimant to be suffering from Dupuytren's contracture. The claimant was denied recovery for the accident because he had not filed his claim within the two-year statute of limitations. In 1950 it was determined by competent medical authority that the employee was disabled from the contracture. The court ruled that the prior ruling on the accident claim did not preclude the claimant from bringing this action for occupational disease since there was sufficient proof that the employee continued to be exposed to the disease since that time. The court further ruled that the disease developed slowly and that disablement occurred when a medical opinion was expressed to the effect that the employee should cease working. The court also ruled that the claimant was deemed to be working for the "same employer" in the "same employment" when the corporation for which he worked entered into a merger. Affirmed. Maguire v. Liebmann Breweries. New York Supreme Court, Appellate Division, Third Judicial Department. No. 52. April 28, 1958.

-- CCH

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804 Silicosis—Statute of Limitations—Application to Reopen Claim.

A claim for further compensation made more than one year after a compromise settlement for disability due to silicosis had been entered into was barred by the statute of limitations. The court ruled that the payments to the claimant were discontinued after the lump sum settlement in February, 1955. This action was instituted more than one year after the last payment was made. Where compensation has been paid or awarded for disability from occupational disease, and the payments have been discontinued, a claim for further compensation made more than one year after the last payment comes too late. Reversed. Harvey Coal Co. v. Colwell. Kentucky Court of Appeals. May 9, 1958.

-- CCH

805 Occupational Disease—Asthma—Pre-Existing Conditions—Special Disability Fund Provision for Reimbursement to Employer.

An insurance carrier was properly entitled to reimbursement under Section 15(8) of a Special Fund law for payments made after 104 weeks since there was sufficient evidence to find that the employer knew of a pre-existing asthmatic condition of the employee and that pre-existing impairment combined with an occupational disease to cause a greater disability than the occupational disease would have caused alone. The record showed that the claimant worked for the employer for over twenty years during which time the claimant had to stop working for short periods because of his asthmatic condition. Section 15(8) of the Workmen's Compensation Act provided for reimbursement from a Special Fund for compensation paid over 104 weeks to an employee who was handicapped at the time hired or who was retained while suffering a handicap. The purpose of the Special Fund was to encourage the hiring of the handicapped. The court ruled that Section 15(8) was applicable since there were sufficient facts to find that the employee was handicapped, that the employer knew of the handicap, that the handicap was of a nature likely to hinder the employee from getting a job, that the employee incurred a disability arising out of his employment, and that the disability was greater than that which would have been caused by the occupational disease alone.

Affirmed. Ferguson v. Art Stone Co. New York Supreme Court, Appellate Division, Third Judicial Department. No. 738. May 23, 1958.

-- CCH

806 Review by Commission of its Order Upon the Introduction of Newly Discovered Evidence—Occupational Disease—Tuberculosis.

A judgment setting aside an order of the commission denying compensation to an employee who had contracted tuberculosis was affirmed since the commission exceeded its authority by failing to review its order upon the introduction of newly discovered evidence by the employee. The record showed that the claimant was employed by the state as a maintenance man in a state institution for the mentally ill. On occasion the claimant would work in a tuberculosis ward where he would come in contact with some of the patients. He contracted the disease and quit work. In a proceeding before the compensation commission evidence was introduced by a witness for the employer that the claimant suffered from tuberculosis before working for the employer. An order was thereupon entered in favor of the employer. Nine days later the employee petitioned the commission for review on the grounds that he had discovered new evidence which would prove that the evidence given on behalf of the employer that the employee had tuberculosis prior to his employment was false. The commission refused to review the new evidence. The court ruled that the board's failure to review the new evidence thwarted the objectives of the Workmen's Compensation Law and therefore the commission acted in excess of its authority. Affirmed. Moore v. Industrial Commission. Wisconsin Supreme Court. No. 255. May 6, 1958.

-- CCH

807 Occupational Disease—Finding of Commission—Last Hazardous Exposure—Statute of Limitations.

The court vacated and remanded an order of the commission, since the commission ruled that the statute of limitations had run against the claimant without first making a finding as to when the claimant had last been exposed to the hazard which he alleged caused

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his disability. The original statute of limitations permitted a claimant to bring a suit for compensation any time within three years after his last exposure to the hazard which he attributes to be the cause of the occupational disease, but an amending section permitted only one year in which a claimant could bring a suit for compensation. The amending section did not make any specific reference to occupational diseases, but rather spoke in broad terms of compensable death and injury. The court ruled that the one year period of limitation was applicable, because where an act amends an existing section of a statute "to read as follows," and purports to be a complete section within itself, any matter which was in the original section, but not in the amendatory section, is repealed by the omission. The court also held that the statute of limitations began to run at the date of the claimant's last exposure to the hazard, and since the commission did not make a determination of the date of the last exposure, the case must be remanded for findings on that issue. Order vacated and remanded. Parker v. Blackwell Zinc Co. Oklahoma Supreme Court. No. 37,900. May 13, 1958. -- CCH

BOOKS, PAMPHLETS AND NOTICES

- 808 Eye Irritation from Solar Radiation of Organic Compounds and Nitrogen Dioxide. E. E. Harton, Jr., and C. C. Bolze. Report No. 23, Air Pollution Foundation, 2556 Mission St., San Marino, Calif. 61 pp. (Apr. 1958). \$3.00.

Experiments on the effect of sunlight-radiated auto exhaust mixtures on eye irritation and other air pollution manifestations have been previously reported (Report No. 19, IHD Abst. 568, May 1957). Similar experiments are here reported in which, instead of auto exhaust, various organic compounds were mixed with nitrogen oxides, at low concentrations of each and the irradiated mixtures were tested for eye irritation and oxidant formation. Oxides of nitrogen, temperature, humidity, and light intensity were also determined. It was found that olefins caused more irritation, and produced more oxidant, than paraffins. The same was true for branched-chain olefins as compared with straight-chain olefins. Olefins with internal double bonds gave more irritation than those with terminal bonds, but there was no effect on oxidant formation. In the experiments comparing various commercial solvents, very little eye irritation was produced and no significant differences in eye irritation effects were found. In general, there was no correlation between eye irritation and oxidant values. -- FFR

- 809 Recommended Safe Practices for Inert-Gas Metal-Arc Welding. Publication AWS A6.1-58, American Welding Society, 33 West 39th St., New York 18, N. Y. 9 pp. (Apr. 1958). \$1.00.

This report supersedes and amplifies tentative recommendations published in 1955. Only those potential hazards which are peculiar to or might be increased by the inert-gas metal-arc process are considered. Trichloroethylene is a hazard if it is present, even in minute quantities, in the vicinity of the welding arc. Carbon dioxide shielding may create a hazard from carbon monoxide if the welder's head is in the path of the fumes or if welding is done in a confined space. Radiant energy, particularly in the ultraviolet range, is a hazard to the bare skin and unprotected eyes, and causes rapid disintegration of cotton clothing. Metal fume fever may be caused by the inhalation of certain metal fumes, in this method as in others. Other possible hazards, such as ozone, nitrogen dioxide, and radiation from thoriated-tungsten electrodes, have been found to be negligible. Safety recommendations include: warning workers of the danger of trichloroethylene decomposition; goggles, skin covering, dark shirts, and no exposed cotton clothing; and local exhaust ventilation. These recommendations and the minor hazards are discussed in detail. -- FFR

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- 810 Health Statistics from the U. S. National Health Survey. Series A-1. Origin and Program of the U. S. National Health Survey. U. S. Public Health Service, Division of Public Health Methods. Public Health Service Publication No. 584-A-1. 36 pp. (May 1958). For sale by Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C. 25 cents.

This publication describes in detail the program of the U. S. National Health Survey, which is now under way. The need for health statistics of the nature included in the Survey is discussed. Earlier studies, which have been inadequate but which contributed useful knowledge in planning the Survey, are described. The program is discussed at length. The essential feature is a health household interview survey, but a number of special surveys will be included. The potentialities and limitations of the program are discussed. An appendix gives the text of the recommendations of the Subcommittee on National Morbidity Survey, U. S. National Committee on Vital and Health Statistics, published in 1953.

-- FFR

- 811 Health Statistics from the U. S. National Health Survey. Series B-3. Preliminary Report on Number of Persons Injured, United States, July-December 1957. U. S. Public Health Service, Publication No. 584-B3. 32 pp. (May 1958). For sale by Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C. 30 cents.

About 25 million persons were injured during the last 6 months of 1957, according to data obtained by the U. S. National Health Survey in household interviews. This includes only persons who sustained injuries that caused them to restrict their usual activities for at least a day or injuries that were medically attended. Males accounted for 14.1 million of those injured and females for 10.8 million. Motor-vehicle accidents accounted for 9.8% of the total persons injured, work accidents for 16.7%, home accidents for 40.3%, and other types of accidental or nonaccidental incidents for the remaining 33.1%. Among those injured 14.9 million persons resided in urban areas, 7.1 million in rural non-farm areas, and 30 million in rural-farm areas. During the 6-month period 213.9 million days of restricted activity resulted from injuries and their sequelae. This information is presented in detail in extensive tables, and sources of data and methods of tabulation are discussed.

-- Cond. from author's summary

- 812 API Bulletin on Precautionary Labels. Guide for the Preparation of Precautionary Labels for Petroleum Products. API Bull. 2511. American Petroleum Institute, Dept. of Technical Services, 50 West 50th St., New York 20, N. Y. 12 pp. (Jan. 1958). \$1.00.

The labeling principles presented are directed to those products, currently being produced both in increasing variety and volume by the petroleum industry, whose nature requires special precautions for handling and use. Through the medium of such labels, it is hoped that precautionary information may reach all those who apply, store, or handle these products. By this means they may be safe-guarded at all times. The American Petroleum Institute and its Interdivisional Committee on Labeling make no claim that the warning-label wordings set forth in this guide comply with any particular statute, ordinance, or regulation, nor do they make any representation as to their sufficiency. Important sections in this pamphlet pertain to definition of terms, label content, preparing warning labels, and API specimen labels.

-- JM

INDUSTRIAL MEDICAL PRACTICE

- 813 Industrial Medicine, the Newest Specialty. C. R. Walmer. Penna. Med. J. 61, 748-751 (June 1958).

The history of occupational medicine is reviewed briefly from antiquity to its present position. Today industrial medicine is a specialized combination of medical and public health practices, uniting all the relevant disciplines with the dual object of improving

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the worker's health and efficiency and of bettering production. The industrial physician, unlike other specialists, practices a broad specialty rather than a narrow one. Extension of the principles of preventive medicine in industry to include off-the-job injuries and illnesses and health counseling now benefits the community as well as the employer and the employee. The community is also benefited by the utilization of medical data and records in the recognition and treatment of disease still unconquered. New products constantly bring new health problems. Nearly all physicians deal with industrial cases; therefore they should have some knowledge of industrial hazards. Such information is increasingly available through various sources. By careful and thorough reporting of occupational diseases, the private physician can assist greatly in providing medical data needed in the elimination of occupational diseases.

- 814 Mutual Goals of Public Health and Occupational Medicine. L. F. Burney.
A. M. A. Arch. Ind. Health 17, 571-576 (June 1958).

Industrial medicine as practiced by progressive industries contributes to public health by preventive health services, health insurance, health examinations with referral to private physicians, and accident prevention. Public health programs, in turn, have much to offer occupational health, including assistance and consultation in case-finding, sanitation, industrial hygiene, and communicable disease control. The local health department may also be the information center on all community health and social services. Some useful patterns have been developed for cooperation between public health and occupational medicine in the research laboratory and the field investigation, in the plant and in the community. Every opportunity should be seized for further cooperative efforts.

- 815 National Health Survey. F. E. Linder. Science 127, 1275-1280 (May 30, 1958).

The National Health Survey, established in 1956, is measuring levels, trends, and social consequences of various illnesses. Various problems encountered in making an accurate survey are discussed, and the program is described. The lessons learned from earlier surveys are being applied to the present survey, which will be based on questionnaires submitted to individual families. Data are collected continuously and include a number of items which are described. Data on each topic will be released as soon as sufficient information has accumulated. (For two reports already published, see Absts. 810 and 811 in this issue).

- 816 A Decree Governing Occupational Medical Services in Spain. R. F. Schneider.
Med. Bull. (Standard Oil N. J.) 18, 1-7 (Mar. 1958).

A decree issued by the Spanish Government in December, 1956, makes compulsory occupational medical service comparable to the highest standards that are voluntary elsewhere. Non-occupational diseases are treated by family physicians under the social security program, and occupational diseases by the National Institute of Occupational Accidents. The industrial physician's duties, therefore, are limited to diagnosis and emergency treatment. All companies with 500 or more employees, and smaller companies with special hazards, come under the law. The number of physicians per company is prescribed, and no doctor can work for more than one company. Among other compulsory features are: selection of qualified physicians; examinations of all employees annually, and of those in hazardous occupations more frequently; industrial hygiene studies and recommendations based thereon; determination of the physical requirements for each job; advice to employees on health problems and types of sports; first-aid instruction; analysis of all accidents in cooperation with the safety technician; and secrecy of information. A translated summary of the decree is given.

- 817 Joint ILO/WHO Committee on Occupational Health. Third Report. World Health Organization. Geneva. Technical Report Ser. No. 135. 22 pp. (1957).
Obtainable from International Documents Service, Columbia University Press, Columbia University, New York 27, N. Y. 30 cents.

This report deals mostly with the training of doctors in occupational health. It emphasizes that every physician should be aware of the physical and mental stresses of

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modern industry, be acquainted with occupational diseases and understand the effects of work on the natural history of common diseases. He should acquire this knowledge as an undergraduate in either of the last two years of the medical course. As expected from a report by physicians, it states that it is logical to look to the physician for leadership in all matters relating to health. Thus the specialist in occupational medicine should be familiar with the place of his co-professionals to permit him to serve as the leader of the occupational health team. He must be a competent physician who has mastered the principles of diagnosis, treatment and prevention of occupational illness among individuals and groups. Training in internal medicine and public health is an essential background to a one-year course, preferably in an occupational health institute.

-- Cond. from Bull. Hyg.

- 818 New Techniques in Teaching Occupational Medicine. J. S. Felton.
A.M.A. Arch. Ind. Health 17, 577-586 (June 1958).

Occupational medicine has been introduced into the curriculum of the University of Oklahoma School of Medicine, and is approaching its fifth anniversary. It was done to familiarize prospective general practitioners with some of the basic principles involved, and the attitudes needed to do an intelligent and sensitive job in working with patients who also are employees. The instructional material has included numerous visual aids, series of lectures that on occasion are sufficiently off-beat as to command attention, working exercises in two outpatient settings, and field trips to a sheltered workshop and to Oklahoma's largest industry, an Air Materiel Command installation. Certain written materials are made available to the students, and an evaluation is requested of the students at year's end.

-- Author's summary

- 819 The Evaluation of Physical Ability. B. Hanman. New Eng. J. Med. 258, 986-993 (May 15, 1958).

The author suggests ways for improving the medical evaluation of physical ability. When a person's ability to engage in certain activities is judged, one danger lies in subjective evaluations such as "no heavy lifting", "no excessive climbing", or "light work only". The use of subjective terms (the rating method) often leads to misunderstandings that result in physical and economic misfortunes for the persons. Equally harmful are evaluations based on disability instead of ability (the disability method). The dangers inherent in the use of these methods can be avoided by substituting a more positive, individual, and specific method. In the specific method advocated, objective units such as hours and pounds are used to express the degree and duration of effort. This method permits the evaluation of each person's abilities on a strictly individual basis. The specific questions to ask about the person at hand should be: Physically fit for what? What activities can this person perform, and how much? And what hazards can he not tolerate with reasonable safety? To help the physician answer these questions, a tested and proved form, entitled a Profile of Physical Abilities, is provided.

-- Cond. from author's summary

- 820 Measuring Human Effort. L. Brouha. Mech. Eng. 80, 81-83 (June 1958).

When a well-coordinated and systematic program is developed, it will be possible to replace the notion of "mechanical work cycle" by the concept of "physiological work cycle". The former leaves many factors unknown. The stop watch is inherently unable to measure the physiological cost of a job. The assessment of human effort is left to the judgment of an observer; consequently, inconsistencies and errors are frequent. A new branch of the study of man, namely occupational physiology, includes the study of heart rate, blood pressure, cardiac output, oxygen consumption and carbon dioxide production, chemical composition of the blood and urine, water balance, and body temperature, all of which are modified by muscular activity. Determination of oxygen consumption is time-consuming, and does not evaluate some factors of physiological stress. On the other hand, measurement of heart rate during work and recovery from work, is recognized as an accurate means of evaluating physiological cost. Physiological measurements also enable assessment of the effects of clothing, evaluation of stress reduction, and prediction of the onset of fatigue.

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- 821 Executive Health Examinations. R. Clyne. A.M.A. Arch. Ind. Health 17, 602-609 (June 1958).

The results of a questionnaire from 40 companies are reported and the conclusions of the author and associates are presented. A personal approach in introducing the program to the executives should be employed. The examination should be performed by the company medical department whenever possible. Examinations should be performed annually with frequent rechecks as required. The examination should include a thorough painstaking history, and a complete physical examination, items of which are specified. The results and recommendations should be discussed in great detail with the patient, and a summary of the findings should be sent to the patient's private physician. The responsibility for following through on the recommendations should fall equally on the patient, his private physician, the medical director, and the examining physician. With the patient's permission, management should be advised of any serious or life-shortening physical defects revealed. Some replicants to the questionnaire report that different policies are pursued by their companies in some respects, but in most cases at least a majority agree with the recommendations given. -- Cond. from author's comment and conclusions

- 822 Practical Significance to Industry of Recent Developments in Tuberculosis Management. E. T. Blomquist. A.M.A. Arch. Ind. Health 17, 597-601 (June 1958).

As a practical implication for occupational medicine, tuberculosis is changing from what seemed an excessively troublesome, highly specialized, and complicated disease to one that is rapidly becoming a simpler and easier condition for the clinician, industrial physician, and public health officer. It may well be, indeed, that we shall conquer this disease by changing it from a chronic, recurrent condition to an acute, infectious disease, susceptible to specific therapy. In any event, tuberculosis is more vulnerable now than at any time in the history of medicine. -- Author's summary

- 823 Differential Diagnosis of Chest Pain. W. J. Hand. Ind. Med. & Surg. 27, 287-291 (June 1958).

The complaint of chest pain is extremely common. Most important is a careful history and careful physical examination. While in most cases the symptom is due to cardiovascular or spinal root disease, one must keep in mind the other less common conditions which may cause similar chest pain. The etiology may extend from the cervical area to the upper abdominal viscera. Usually a few simple tests and laboratory studies will accurately confirm the diagnosis. -- Author's summary

- 824 Cardiac Emergencies. S. E. Chapman. Ind. Med. & Surg. 27, 278-280 (June 1958).

A cardiac emergency calls for careful decision. The on-the-spot physician must determine whether the fainting spell, the chest pain, or the dyspnea is benign and not alarming, or an indication of a grave cardiovascular emergency capable of causing death. In few other instances is a physician called upon to act so decisively in so short a time. It takes a tentative diagnosis, and immediate treatment to pave the way for the future therapy. A most disheartening situation occurs when a physician is able to make the correct diagnosis of a cardiac emergency, but then finds he does not have the suitable medication available. Twenty-one drugs frequently needed are listed by the author. The characteristics of various cardiac disturbances are described and the appropriate treatments to be applied in each case are briefly outlined.

- 825 An Analysis of Cancer Mortality in Employees and Annuitants of an Oil Company and an Oil Pipe Line Company. V. C. Baird, J. W. Hammond, and B. E. Bennison. Med. Bull. (Standard Oil N. J.) 18, 60-66 (Mar. 1958).

Epidemiological studies of a group of 15,000 petroleum workers for a period of 21 years reveal a lower incidence of cancer deaths than in the general population in the same area. Death rates for skin cancer were also lower in petroleum workers. The incidence of lung cancer deaths was slightly higher in the petroleum group, but the difference is not statistically significant.

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- 826 Should Regular Cystoscopy be Included in the Medical Supervision of Workers in Amino Compounds? H. Groetschel. Zentr. Arbeitsmed. u. Arbeitsschutz. 7, 294-296 (Dec. 1957). German.

The author discusses the question of regular cystoscopic examination of workers in amino compounds to secure the early diagnosis of bladder tumors. There is a description of the findings at a factory where benzidine is made and also reference to the different opinions which have been expressed in the literature on the subject of the medical supervision of the workers. The main points considered are: (1) the drawbacks of cystoscopy in that the records show that the procedure itself may frequently result in harm, e.g., sepsis to the urogenital system; (2) the rapidity of onset of bladder tumors; and (3) the value of urine examination since the persistent appearance of blood cells in urinary sediment is suggestive of a malignant vesical tumor. It is accordingly recommended that the plan for medical supervision should consist in a microscopical examination of the urinary sediment every month, and a more complete examination of the sediment every 6 months. If any abnormality is found, for example, blood cells are discovered only once, cystoscopy should be carried out immediately. If no abnormality is found at the cystoscopy but blood cells be again found at a subsequent examination of the sediment, the workman should be taken off his work. However, if at the preliminary sediment examinations blood was found on only one occasion and cystoscopy revealed only a transient irritation of the vesical mucous membrane it would appear to be unnecessary for the worker to discontinue his normal occupation.

-- Cond. from Bull. Hyg.

- 827 Practical Psychiatry in Industry. R. H. Felix. A.M.A. Arch. Ind. Health 17, 614-619 (June 1958).

Achievement in the alleviation and prevention of mental ill health has been remarkable, considering two primary difficulties: an acute shortage of personnel to meet ever-growing demands, and the dependence of contemporary psychiatry on an enormous amount of information and research on all levels of human and social inquiry. Only a small segment of the total demands can be met by psychiatrists. Many of the nonmedical aspects must be carried out by such informed people as clergymen, educators, and administrators. Emotional problems specifically concerned with leadership, accidents, and old age, are discussed. The supervisor has an important role, both in promoting mental health and in preventing accidents. Reference is made to a study which showed that the frequency of accidents is related to the personality of the foreman. (IHD Abst. 363, Mar. 1952). A number of emotional problems of the older worker and retiree are considered.

- 828 Practical Application of Psychiatric Techniques in Industry. R. T. Collins. A.M.A. Arch. Ind. Health 17, 620-623 (June 1958).

Industrial medicine has long shifted its focus from first-aid treatment, aspirin dispensing, and finger wrapping to health maintenance. Similarly, psychiatry has shifted its focus from treating persons in mental hospitals to treating persons outside the hospitals, including industrial workers. Another function of psychiatry, which it shares with other social disciplines, is the study and treatment of groups of people and their interpersonal relationships. This is known as group dynamics. Two general methods, the physician-relationship technique and the interviewing technique, are practiced. A number of points to be remembered in both these techniques are presented.

- 829 Stress Factors in Industry. An Approach at the U. S. Naval Gun Factory. D. C. Lipman. Ind. Med. & Surg. 27, 295-297 (June 1958).

At the United States Naval Gun Factory, a government agency employing several thousand civilian personnel, a stress clinic has been in operation for more than two years. In this clinic's activities emphasis centers upon appropriate counseling and upon a basic stress diet with high protein, vitamin, and mineral values.

-- Author's summary

- 830 Current Problems in the Field of Respiratory Protection. E. C. Hyatt.
Am. Ind. Hyg. Assn. J. 19, 121, 122 (Apr. 1958).

The author discusses the problems and presents the recommendations of the Joint AIHA-ACGIH Respirator Committee, appointed in 1956. It is recommended that the two organizations should: (1) promote the establishment of responsibility in a central agency of the federal government to investigate and compile data relative to existing and new exposure problems, set up new Approval Schedules, and approve all types of commercially available respiratory protective equipment; (2) promote basic research and development in the field; (3) promote the development and dissemination of more comprehensive information on respiratory protective devices; (4) assist and advise the central agency in the preparation of Approval Schedules for respirators not already covered, and in the revision of current schedules; and (5) establish a permanent committee to assist in implementing the program outlined.

- 831 A Discussion of the Bureau of Mines Approval Schedules for Respiratory Protective Devices. S. J. Pearce. Am. Ind. Hyg. Assn. J. 19, 126-128 (Apr. 1958).

The operation of the Bureau of Mines approval system for respiratory protective devices is explained briefly. Some considerations in regard to the performance of respirators are discussed, and plans for broadening the respirator approval system are outlined. The types of respirators not covered by existing Bureau of Mines approval schedules include: (1) filter-type respirators for protection against particulate aerosols, such as beryllium dusts and fumes, dusts impregnated with organic phosphorus insecticides, and radioactive substances; (2) paint-spray respirators; (3) chemical cartridge respirators for protection against gases and vapors other than organic vapors; (4) escape-type self-contained breathing apparatus; and (5) combination air-line and self-contained breathing apparatus. Plans for tests and approval procedures for these types are discussed.

- 832 A Comparison of Performance Standards and Tests Specified by Bureau of Mines Schedule 14F and by the Chemical Corps for the M9A1 Mask. G. J. Fleming.
Am. Ind. Hyg. Assn. J. 19, 130-139 (Apr. 1958).

Within the limits of the objectives for which the Bureau of Mines schedules and the Chemical Corps specifications can be compared, there is some general similarity in the gas tests and air resistance tests. The Chemical Corps test for ensuring efficiency of particulate removal is generally held to provide a superior filter. The Bureau of Mines schedule calls for only generalized requirements for the facepiece and other components, but extensive man tests for the complete mask. Conversely, the Chemical Corps prescribes detailed tests for the facepiece and other components, but no tests for the complete gas mask. The Chemical Corps mask has been subjected to extensive evaluation during its development. The test data are presented in extensive tables. -- Author's summary

- 833 Respiratory Protection Equipment Developments by the U. S. Army Chemical Corps. A. L. West. Am. Ind. Hyg. Assn. J. 19, 140-148 (Apr. 1958).

An illustrated discussion is presented on the following classes of individual respiratory protective equipment which have been standardized by the U. S. Army Chemical Corps: military protective masks, special purpose gas masks, self-contained breathing apparatus, dust masks, and paint spray respirators. Also discussed are two experimental protective masks developed by the Chemical Corps for the Federal Civil Defense Administration. The procedures used by the Chemical Corps in undertaking the development and testing of new items of respiratory protective equipment are briefly described.

-- Cond. from editor's summary

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- 834 The Respirator Problem—an Industrial Hygienist's Viewpoint. H. S. Jordan.
Am. Ind. Hyg. Assn. J. 19, 149-153 (Apr. 1958).

The lack of interest on the part of most industrial hygienists has been responsible for the growth of a number of problems in the respiratory protective equipment field. It is believed these problems have been created by: (1) the lack of a fixed responsibility for the Bureau of Mines to evaluate all commercially available respirators; (2) the use of an approval system to evaluate respiratory protective equipment rather than a rating system; (3) the lack of adequate research for investigating all matters relative to civilian respiratory protective equipment; and (4) the lack of a formal review of proposed Bureau of Mines approval schedules by industrial hygiene groups. In every case, the temptation to prescribe the cure for each problem was deliberately avoided, for it is believed that the necessary corrective action requires the organized attention of the industrial hygiene associations rather than the opinions of any individual.

-- Author's summary

- 835 Testimony of the Doctor in Court. J. Frenkil.
Ind. Med. & Surg. 27, 281-284 (June 1958).

Rules and suggestions are presented for the benefit of the doctor who has to appear in court. The physician should perform his task with the greatest respect for the court and all its constituents. He should come well prepared—complete and full knowledge of the medical aspects of the case is essential. The doctor's mannerisms and appearance are important. He should be pleasant in the presentation of testimony. The jury should be addressed as much as possible rather than the people in the courtroom. Courtesy to the opposing lawyer during cross-examination is requisite and it is imperative that the doctor never lose his temper. He should be well dressed because as a witness he will be closely observed and he should be particularly cognizant of the impression the manner of dress might make on the jury. All answers to questions calling for opinion should be kept within the realm of reasonable medical certainty. Above all, he should remember to be impartial.

- 836 Occupational Medicine and Modern-Day Drugs. A. H. Holland, Jr.
A.M.A. Arch. Ind. Health 17, 593-596 (June 1958).

This article outlines some of the work and duties of the Food and Drug Administration. The work of this organization is divided into two main categories—new drugs, and drugs and devices, or so-called enforcement activities. Extended definitions, as they exist in regulation form, are given of a "new drug". In essence, the law provides that before a manufacturer can introduce a new drug into interstate commerce he must first submit his data in the form of a new drug application to the Food and Drug Administration for review. If the New Drug Branch of the Bureau of Medicine concludes that the drug is safe, the application is made effective and the manufacturer can then proceed to market it. The subject of worthless cancer remedies is another important area of activity which occupies the attention of the Drug and Device Branch, as is also the perennial problem of the fake therapeutic device. The main purpose of the Food and Drug Administration is to help the physician and his patients by assuring a supply of safe, effective, ever-better drugs for the prevention and treatment of disease.

- 837 Georgius Agricola 1494-1555. Anon. Ind. Med. & Surg. 27, 292-294 (June 1958).

This is a short biography of Georgius Agricola who by near common consent is accepted as the first substantial contributor to occupational health. Foremost, he stands out as an engineer. Thus, in a measure, he is the prototype of industrial hygienists. In keeping with his period, he likewise was a physician, but as a physician, is not of the stature of Ramazzini of the next century. Georgius Agricola was born at Glauchau, in Saxony, on March 24, 1494. We know practically nothing of Agricola's antecedents or his youth. His real name was Georg Bauer ("peasant"), and it was probably Latinized by his teachers, as was the custom of the time. Long ignored by his own countrymen, Agricola reached his highest historical estate through the translation of his "De Re Metallica" by Herbert and Lou Hoover. Besides this work Agricola also published a series of technical books devoted

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to physical geology, subterranean waters and gases, systematic mineralogy, history of metals, topographical mineralogy and related fields. He died on November 21, 1555. A brass memorial plate hung in the Cathedral at Zeitz had already disappeared in 1686, nor have the cities of his birth or residence ever shown any appreciation of this man, whose work more deserves their gratitude than does that of the multitude of soldiers whose monuments decorate every village and city square.

SKIN DISEASES AND BURNS

- 838 Skin Injury in the Industrial Production of Potassium Dichromate. C. Tataru, A. Marinescu, I. Capusan, R. Ripan, and C. Liteanu. Berufsdermatosen 5, 218-231, 283-295 (1957). German.

Examination of the skin of workers showed skin manifestations in 83% of those studied. The lesions were attributed to the action of chromium salts. Clinical experimental investigations and animal experiments indicate that the skin lesions are not of allergic genesis. Additional animal experiments were made to determine the action of percutaneously applied dichromates in concentrations chosen from the different stages of production. High concentrations caused the death of animals. With lower concentrations the surviving animals showed skin lesions similar to those observed in humans. Blocking the peripheral nerve pathways accelerated the fatal outcome following lethal concentrations. In animals thus treated, the chromium content of the organs was increased. In lower concentrations the skin lesions were more extended following procaine. The central nervous action of percutaneously applied potassium dichromate was studied by investigation of conditioned reflexes. The conditioned reflexes were disturbed after 4 to 8 hours whereas skin lesions did not appear before 18 to 24 hours. It is concluded that the nervous system is involved in the pathogenesis of potassium dichromate skin damage. Prophylactic measures are recommended.

-- Chem. Absts.

- 839 Sensitivity to Fluorescent (Blue-Green) Light. J. H. Lamb, Phyllis E. Jones, G. Rebell, and H. D. Alston. A.M.A. Arch. Dermatol. 77, 519-525 (May 1958).

Frosted glass, 2 mm. in thickness, diminished the intensity of the immediate erythematous reaction to fluorescent light in one case, but there was a delayed response of modified intensity in the following ten minutes. An increase in the distance of the fluorescent lighting from the subject may offer protection to the sensitive person. Four cases of erythema perstans type of sensitivity to visible light in the spectral range of 4000 A to 7000 A are reported. Therapy in three cases consisted of removal of the light and use of testosterone propionate.

-- Authors' summary

- 840 Cobalt Folliculitis. C. M. Sidell, J. G. Erickson, and J. E. McCleary. Calif. Med. 88, 20, 21 (Jan. 1958).

Clinical observations in 60 cases of folliculitis or pronounced activation of acne in patients taking cobalt led to the conclusion that the development or aggravation of the dermal lesions was caused by ingestion of the metal. The dermal manifestations abated when use of cobalt was discontinued. Active acne is considered a contraindication to the use of vitamin-iron-mineral supplements containing cobalt. Short courses of antibiotics in addition to regular acne regimen helped shorten the course of the eruption.

-- Editor's summary

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- 841 Sodium-Potassium Alloy. An Experimental Study of Its Hazards. A. J. Finkel and W. B. Lyons. *A.M.A. Arch. Ind. Health* 17, 624-633 (June 1958).

The thermal, chemical, and radiation hazards of liquid sodium-potassium alloy (NaK) have been reviewed and the nature of the therapeutic problems have been evaluated. Experiments with an artificial indicator system have been performed in a study of the penetration of test films by NaK. In the light of these investigations it is suggested that 1.0 to 2.5% stearic acid in light mineral oil may be effective in retarding the reactivity of the NaK with water on and in the skin. Skin and hair covered with NaK or sodium metal should be flooded with the oil preparation and the alkali metal brushed or gently scraped off with a metal spatula. Disposal of the alkali metal should be accomplished by allowing it to react with butyl alcohol. The use of water should be avoided until the alkali metal has been removed from the surface of the body. Appropriate surface active agents added to the mineral oil may enhance its control over NaK reactivity. -- Authors' summary

- 842 The Shock that Kills. N. G. Long. *Natl. Safety News* 77, 54, 116, 117 (June 1958).

Electrical burns usually are the more serious type of burns treated in medical and industrial practice. A severe burn is a wound, with sudden blood and plasma loss and resulting hypovolemic shock (increasing blood viscosity), causing what is termed "burn shock". This differs from electrical shock in that the effect on the heart is more gradual. Shock potential is also increased by the release of a toxin from a clostridal form of bacteria that is always present in large amounts in the gastrointestinal tract and activated by such a burn. Treatment consists of forcing the patient to lie down, administration of tetanus antitoxin or toxoid, sedation, oxygen treatment, avoidance of external heat, antibiotics, and early skin graft. Small electrical burns are readily treated before medical treatment by the usual first-aid measures. The mechanism of fatal electric shock is described. The effect is too rapid for first-aid treatment. The problem of less severe shock lies in feeding oxygen without the aid of heart coordination by resuscitation. Procedures have been discussed extensively in a number of books. Solution of the problem lies in prevention and constant vigil on the part of safety and electrical engineers and of the public.

CHEMICAL HAZARDS

- 843 Toxicity of High-Energy Fuels Poses Hazards for Handlers. W. H. Schechter. *Missiles and Rockets* 3, 85-86 (Apr. 1958).

Hazards associated with the boron hydrides are presented. Diborane can be detected by odor at 3-4 ppm, pentaborane at 2.5 ppm, and decaborane at 0.35 ppm. Maximum allowable concentration for diborane is 0.1 ppm for daily exposure. Pulmonary damage results at 5 ppm for 6 hours per day and 5 days a week. Pentaborane and decaborane attack the central nervous system rather than the pulmonary system. At 3.3 ppm, pentaborane causes death in test animals for repeated 5-hour daily exposures. Maximum allowable concentration is 0.01 ppm for pentaborane and 0.05 ppm for decaborane. At present there are no commercial detectors for the boron hydrides. One device under development can detect 0.4 ppm pentaborane; another is expected to determine the boranes to 0.1-0.01 ppm. -- Chem. Absts.

- 844 Tellurium Oxide. An Animal Study in Acute Toxicity. M. L. Amdur. *A.M.A. Arch. Ind. Health* 17, 665-667 (June 1958).

A small animal study in acute toxicity of tellurium oxide directed particularly to test the efficacy of dimercaprol (BAL) in oil and of reducing substances, such as ascorbic acid, as antidotal materials has been completed. It would appear that tellurium, as the

oxide, does not have a particularly high degree of toxicity when permitted to run its own course. It would appear quite certainly that dimercaprol in oil is of no value in the therapy of such exposures. In fact, it distinctly enhances the toxicity of such exposure to tellurium, and particularly so when dimercaprol is available within the host prior to exposure to tellurium oxide. The dimercaprol-tellurium complex is probably responsible for the enhanced toxicity, since tellurium recovery studies would indicate that the presence of tellurium in the kidney would otherwise not be incompatible with survival. The effect of reducing substances is equivocal. Their effect on survival time is questionable. An inspection of the quantitative recovery values might indicate an earlier diversion of tellurium to the livers of those animals receiving ascorbic acid. -- Author's summary

- 845 The Effect of Fluorine on the Dental System of Industrial Workers. H. Herbst. Arch. Gewerbepathol. Gewerbehyg. 16, 2-12 (1957). German.

This is an account of the findings in a study of pathological changes in the dental system of workers exposed to fluorine compounds. It concerns 95 workers who were employed in a factory in Saxony where a variety of fluorine compounds including refrigeration agents such as dichlorodifluoromethane are prepared. The number of missing teeth was greatest in those most exposed. The main effect of fluorine appeared to be on the periodontal tissues and the gums which resulted in loosening and loss of teeth. "Mottled teeth," which are the result of the toxic effect of fluorine on the enamel cells during the period of mineralization of teeth, were not observed. On the other hand, in many of the workers, the teeth were found to be discolored and to have somewhat irregular surfaces—a condition brought about by the corrosive action of fluorine on the enamel resulting in acid necrosis. Very marked deposition of dental tartar was noted among these workers. Chemical analysis of the teeth revealed that the fluorine content was between 4 and 14 times that of normal teeth. Resistance to dental caries in these workers was also observed which may perhaps be associated with the action of fluorine on the salivary glands which by action on the vagus causes a lessened viscosity and increased secretion of saliva.

-- Cond. from Bull. Hyg.

- 846 Production of Toxic Gas (Nitrogen Oxides) in Silage Making. W. H. Peterson, R. H. Burris, R. Sant, and H. N. Little. J. Agr. Food Chem. 6, 121-126 (1958).

Five silos were tested in the summer and fall of 1956 for nitrogen dioxide production; all gave off the gas. In one instance the brown fumes were so extensive that good colored photographs of the gas were obtained. The data obtained indicate that bacteria and not plant enzymes are responsible for the formation of the nitrogen oxides.

-- Chem. Absts.

- 847 Designing of a New Drug with Antidotal Properties Against the Nerve Gas Sarin (Isopropyl Methylphosphonofluoridate). I. B. Wilson. Biochim. et Biophys. Acta 27, 196-199 (1958).

2-Pyridinealdoxime dodecyl iodide was prepared expecting that it would be much more lipide-soluble than the methiodide and would, therefore, penetrate tissues, in vivo, which were not permeable to the methiodide; if such were the case 2-pyridinealdoxime dodecyl iodide might augment the antidotal properties of the methiodide in those instances of alkyl-phosphate intoxication in which the significant area of penetration of the poison did not lie entirely within the sphere of penetration of the methiodide. The methiodide was readily soluble in water and very poorly soluble in chloroform, and 2-pyridinealdoxime dodecyl iodide showed the reverse. 2-Pyridinealdoxime dodecyl iodide was about one third as active as the methiodide as an in vitro reactivator of tetraethyl pyrophosphate-inhibited acetylcholinesterase, compared at a concentration of 5×10^{-6} M. 2-Pyridinealdoxime dodecyl iodide considerably extended the antidotal properties of the methiodide plus atropine when administered to white mice poisoned with sarin.

-- Chem. Absts.

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- 848 Exemption of Tetra Copper Calcium Oxychloride from the Requirement of a Tolerance.
Anon. Federal Register 23, 1211 (Feb. 27, 1958).

Residue of tetra copper calcium oxychloride is exempted from the requirement of a tolerance under the Federal Food, Drug, and Cosmetic Act when applied to a crop prior to harvest.
-- Chem. Absts.

- 849 The Control of a Lead Hazard in the Silversmithing Industry. L. D. Pagnotto and H. Bavley. Am. Ind. Hyg. Assn. J. 19, 73, 74 (Apr. 1958).

Lead has gradually replaced a large percentage of the more expensive tin in Britannia metal used for the production of parts of silver-plated holloware. A lead hazard was found in the process of burnishing or "sandbobbing". Lead concentrations in the air at the breathing zone were found excessive, and several cases of lead poisoning were discovered. The condition was corrected by installation of suitable exhaust ventilation.

- 850 The Influence of Na-Ca Salt of EDTA on Iron and Copper Levels in Blood and Urine. J. Teisinger and V. Fiserova-Bergerova. Casopis lekaru ceskych 96, 1605-1610 (Dec. 20, 1957). Czech.

Changes in the levels of iron and copper in serum and the excretion of both metals after the administration of Na-CaEDTA in a group of healthy individuals not in contact with lead, and a group of subjects with chronic lead poisoning, have been observed. After injection, serum iron and copper increased in both groups to a maximum level from 4 to 5 hours later. The urinary excretion of both metals was the same in control and experimental groups. On the day of injection about 12 times more iron and 4 times more copper appeared in the urine. With repeated administration iron excretion decreased which suggests exhaustion of body stores.
-- English summary (Bull. Hyg.)

- 851 Industrial Lead Poisoning. I. Absorption, Transportation, Deposition, and Excretion of Lead. 3. An Experimental Study of Lead Intake in Human Beings. Y. Imamura. Osaka City Med. J. 3, 167-194 (1957).

Lead acetate was given by mouth to normal Japanese male adults at a level of 3 mg. daily for the first 61 days, 6 mg. daily for the second 60 days, and with no lead intake in the remaining 5 months of the experiment. Ingested lead was recovered most rapidly in the feces, followed by urine and blood in that order. At the end of the experiment 70-80% of the ingested lead had been recovered in the excreta while the rest remained in the body. The only changes observed were a decreased erythrocyte count and hemoglobin content and an increase in urinary coproporphyrin during the lead intake stages. No clinical symptoms were noted and liver function was normal when tested by six different methods.
-- Chem. Absts.

- 852 The Diagnostic and Therapeutic Use of Edathamil Calcium Disodium (EDTA) in Excessive Inorganic Lead Absorption. W. J. H. Leckie and S. L. Tomsett. Quart. J. Med. 27, 65-82 (1958).

Seven subjects with excessive lead absorption were treated with intravenous EDTA in different ways, and the resulting levels of lead excretion compared. One patient, whose symptoms suggested lead poisoning, but whose employment did not, was similarly treated before and after lowering the plasma pH. Eight control patients received a single dose of intravenous EDTA, the resulting rise in urinary lead excretion being determined. The results indicate that optimum excretion of lead in the urine in a case of excessive lead absorption could be achieved by giving 2 g. of EDTA by intravenous infusion over a period of 6 hours daily. With this treatment all patients in this category excreted lead in the urine at a rate of 1.5 mg. in 24 hours. Lead excretion in patients not so exposed and simultaneously treated varied between 0.022 and 0.65 mg. in 24 hours. This should help in diagnosing excessive lead absorption where urinary lead values are not sufficiently raised and other

blood and biochemical findings are not conclusive. It is suggested, however, that in cases of severe lead poisoning, the intravenous EDTA should be given continuously for at least 48 hours in 6 hour infusions twice daily. It appears that the urinary excretion of lead after administration of EDTA is not influenced by a single dose of parathormone, and is actually depressed by hydrocortisone. Lowering plasma pH by means of ammonium chloride and acetazolamide, although it increased urinary lead excretion without EDTA, appeared to depress excretion when EDTA was used. The renal excretion of EDTA was accelerated by lowering the plasma pH. In a total of 100 intravenous infusions of EDTA, no toxic effects were noted.

-- Chem. Absts.

- 853 Tolerance for Residues of Sodium Dehydroacetate.
Anon. Federal Register 23, 1697 (March 12, 1958).

A tolerance of 65 ppm is established under the Federal Food, Drug, and Cosmetic Act for residues of sodium dehydroacetate, as dehydroacetic acid, in or on strawberries from postharvest application.

-- Chem. Absts.

- 854 Studies on the Toxicity of n-Propyl Nitrate Vapor. W. E. Rinehart, R. C. Garbers, E. A. Greene, and R. M. Stoufer. Am. Ind. Hyg. Assn. J. 19, 80-83 (Apr. 1958).

The main toxic effects from inhalation of n-propyl nitrate vapor are methemoglobinemia and anoxia although dogs exposed repeatedly to sublethal concentrations also showed clinical laboratory evidence of hemolytic anemia and hemoglobinuria. Upon continued exposure, this anemic condition may be reversed by a compensatory increased hematopoietic activity. The vapor hazard of the material for rodents is similar to aniline or furfuryl alcohol, but dogs are considerably more sensitive to the toxic effects of the vapors. It may be found that man is of similar or greater sensitivity and a safe operational limit may have to be established on the basis of personal discomfort. A reasonable maximum acceptable concentration for man may be 50 ppm or less based on animal experimentation.

-- Authors' summary

- 855 Tolerance for Residues of Tetraiodoethylene. Anon.
Federal Register 23, 164-165 (Jan. 9, 1958).

A tolerance of 15 ppm is established under the Federal Food, Drug, and Cosmetic Act for residues of this compound on cantaloupe from postharvest application.

-- Chem. Absts.

- 856 Observations on the Toxicity of Dimethyl Sulfate in Animal Experiments.
L. Ghiringhelli, U. Colombo, and A. Monteverde. Med. lavoro 48, 634-641 (Nov. 1957). Italian.

The time taken to kill 50% of the animals exposed to inhalation of air containing 75 ppm of dimethyl sulfate was determined on 40 mice, 16 rats and 16 guinea pigs. The time was 17.4 minutes for mice, 23.6 minutes for guinea pigs and 25.8 minutes for rats. The symptoms observed on the intoxicated animals were irritation of the conjunctivae and of the respiratory tract mucosae and signs of impairment of the nervous system. The pathological findings in deceased animals were congestion of kidneys, spleen and particularly liver and lungs. The most evident lesions were found in the lungs, which showed marked emphysema and often areas of peribronchitis and in the liver which showed cloudy swelling, fatty degeneration and areas of necrosis. The toxic action of dimethyl sulfate vapors was partly attributed to hydrolyzed sulfuric acid and partly to the whole molecule of the toxic substance. The former would induce the irritative signs on the conjunctivae and respiratory tract mucosae, the latter the central nervous system lesions and visceral degenerative changes. It has been suggested that dimethyl sulfate could possess its methylating activity even in vivo and exert it on the carboxylic groups of several organic molecules and particularly of some enzymes which would thus be inhibited in their activity.

-- Cond. from English summary (Bull. Hyg.)

IN RE: ABRAMS November 1952

- 857 Studies on Acute and Subacute Benzidine Poisoning. 4. Summary. O. Oida.
J. Sci. Labour (Tokyo) 34, 352-357 (May 1958). Japanese.

In order to study acute and chronic effects of benzidine on the living body the author carried out a series of animal experiments and made histological examinations of various organs and qualitative and quantitative determinations of this substance in urine and tissues. The results, given in more detail in the earlier papers, are summarized here. It was proved that long-term experimental administration of benzidine could produce cirrhosis of the liver. Free benzidine excretion in urine seemed to increase gradually in parallel with decrease of detoxication in the liver. Hematuria, which is clinically observed in human beings, has been ascribed to bleeding from the bladder. The author's experiments disclosed, however, that hematuria in acute benzidine poisoning of rabbits and dogs was due to kidney disorder and no hemorrhagic change was observed in the bladder. Further studies are required to clarify the cause of this difference between human beings and animals. The affinity of benzidine to the muscle was noted in histochemical examinations.

-- Adapted from English summary

- 858 Dimazine Comes of Age as Rocket Fuel. W. G. Strunk.
Missiles and Rockets 2, 116-120 (Sept. 1957).

The author outlines the properties of unsymmetrical-dimethylhydrazine as a rocket fuel. He also gives storage, fire hazards, toxicity, and propellant applications.

-- Chem. Absts.

- 859 Tropical Hazards Associated with the Use of Pentachlorophenol. J. A. Menon.
Brit. Med. J. 1, 1156-1158 (May 17, 1958).

Nine cases of unusual illness are recorded, and, in one, pentachlorophenol was found in high concentration in the urine. The illnesses were characterized by signs of a raised basal metabolic rate, and it is suggested that they were due to poisoning with pentachlorophenol. The difficulty of accurate diagnosis at the time, owing to lack of any simple specific test, and the need for chemical analysis to be carried out at specialized centers, is stressed. Post mortem macroscopic and microscopical findings have not so far revealed any diagnostic lesions. It is also suggested that the problem may well be magnified in tropical countries where workers live on a simple rice diet and may have some racial susceptibility.

-- Author's summary

- 860 Tolerances for Residues of Heptachlor (1, 4, 5, 6, 7, 8-Heptachloro-3 alpha, 4, 7, 7 alpha-tetra hydro-4, 7 methanoindene). Anon. Federal Register 23, 1598-1599 (Mar. 6, 1958).

The following commodities are added to those for which a tolerance of 0.1 ppm was previously promulgated under the Federal Food, Drug, and Cosmetic Act for residues of heptachlor: apples, barley, black-eyed peas, cherries, cowpeas, grapes, grain sorghum (milo), oats, peaches, peas, pineapple, rye, tomatoes, and wheat.

-- Chem. Absts.

- 861 The Clinical Picture of Poisoning by Organic Phosphorus Compounds.
A. Fribońska-Waelschova. Arch. Gewerbepathol. Gewerbehyg. 16, 63-71 (1957). German.

The author gives clinical particulars of 11 cases of mild and severe poisoning by various organic phosphorus compounds. The observations on these cases are then analyzed with a view to studying the pharmacological action of these poisonous compounds. Among the main conclusions it is stated that the poisonous action cannot be explained solely as an inhibition of cholinesterases with the resulting tonic vagus effects. In some patients there was tachycardia, hypertension, pyrexia and myocardial damage. There were manifestations of neurological disturbance in almost all cases, and these nervous effects and the pyrexia are, from the evidence of published literature, regarded as the result of the irritant action of organic phosphates on the sympathetic ganglia and cerebral centers. The hypothesis is also made that organic phosphates bring about the inhibition of phosphorylation of thiamine and so a disturbance of the carbohydrate metabolism with the result that the myocardium is damaged. There follows an increase of thiamine which then acts like atropine and causes the tachycardia and hypertension.

-- Bull. Hyg.

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- 862 Tolerances for Residues of Captan. Anon. Federal Register 23, 1808 (Mar. 18, 1958).

The previous tolerance is revoked and a tolerance of 100 ppm is established under the Federal Food, Drug, and Cosmetic Act for residues of captan (N-trichloromethylmercapto-4-cyclohexene-1, 2-dicarboximide) in or on a large number of raw agricultural commodities from preharvest or postharvest uses or combinations of such uses.

-- Cond. from Chem. Absts.

- 863 Tolerances for Residues of Maneb. Anon. Federal Register 23, 2179 (Apr. 3, 1958).

The previous tolerances for residues of maneb (manganese ethylene-bis (dithiocarbamate)) calculated as zinc ethylenedisithiocarbamate established under the Federal Food, Drug, and Cosmetic Act are revised to the following: 10 ppm in or on apricots, beans (succulent form), cabbage, celery, Chinese cabbage, collards, endive (escarole), kale, lettuce, mustard greens, nectarines, peaches, spinach, turnip tops; 7 ppm in or on apples, beans (dry form) carrots (roots or tops), cranberries, cucumbers, eggplants, figs, grapes, melons, onions, peppers, summer squash, sweet corn (kernels plus cob with husk removed), tomatoes, turnip roots, winter squash; 0.1 ppm in or on almonds and potatoes.

-- Chem. Absts.

- 864 Tolerances for Residues for Malathion in Milk. Anon. Federal Register 23, 976-977 (Feb. 14, 1958).

The previous tolerances for malathion are revised to include zero ppm in milk.

-- Chem. Absts.

- 865 The Toxicology of an Aniline-Furfuryl Alcohol-Hydrazine Vapor Mixture.

K. H. Jacobson, W. E. Rinehart, H. J. Wheelwright, Jr., M. A. Ross, J. L. Papin, R. C. Daly, E. A. Greene, and W. A. Groff.
Am. Ind. Hyg. Assn. J. 19, 91-100 (Apr. 1958).

Single or repeated exposure of laboratory animals to vapors dispersed from a liquid mixture composed of 45% aniline, 45% furfuryl alcohol, and 7% hydrazine caused the formation of methemoglobin with a resulting decrease in oxygen capacity of the blood and anoxemic tissue changes. Some hemolysis was noted on repeated exposures. The acute toxicity of the mixture was slightly greater than would be expected from the proportions and potencies of the components present in the mixture. While the possibility of potentiation of toxicity on chronic exposures cannot be fully evaluated until more information on the chronic toxicity of furfuryl alcohol is obtained, it does not appear probable that significant potentiation occurred on repeated exposure. Thus, if the safe levels of the components are not exceeded, exposure to a mixture of these components should also be safe. Human subjects smelling the vapor through an osmoscope could generally detect the mixture as well as the components, at levels of about 10 ppm. The mixture was described as smelling more like aniline than like any of the other components.

-- Authors' summary

- 866 Toxicological Aspects of Common Foods and Drugs. L. G. Parmer. Ind. Med. & Surg. 27, 285-286 (June 1958).

It is common knowledge that it is almost impossible in our present economy to have some so-called "pure foods". There are a tremendous number of chemical additives that enter our foods for many reasons. In recent years pesticides have been introduced into agriculture in ever-increasing amounts. Pesticides are essentially poisons, and injuries can result when the chemical is ingested in large quantities. To counteract this problem the Division of Pharmacology of the Food and Drug Administration obtains evidence of safety by feeding laboratory animals throughout their entire lifespan, and subjecting these animals to minute investigations to determine whether they were injured in any manner whatsoever. The government's role in protecting the public is to establish tolerances for residues of pesticides in foods, allowing a sufficient margin of safety to keep all

toxic substances that may be ingested below potentially injurious levels. Despite the fact that some physicians have blatantly stated that DDT in our food is the cause of many diseases, especially virus-X, there is no evidence at the present time to consider our foods dangerously contaminated. Despite the list of chemicals which probably numbers in the hundreds that enter into our daily diet, the Food and Drug Administration is convinced that there is no imminent danger from food on the market today.

INDUSTRIAL DUSTS

- 867 Dust Control in Wet Drilling. M. Landwehr, R. Kortner, W. Walkenhorst, and E. Bruckmann. Staub No. 53, 841-879 (1957). German.

This paper aims to correct erroneous conceptions occasionally found in the papers of other authors concerning conditions at the bottom of a drill hole when drilling through rock. Insufficient consideration is given to the fact that the fixation of dust is reduced when air is admitted with the water during the drilling operation. By means of comparative tests when drilling with a wet bit, with ventilated and non-ventilated centrally-flushed drill hemmers and with dry drilling, it was ascertained that with wet bits perfect dust control even down to sub-microscopic particles is attained; however, when air gets into the water the degree of dust control diminishes.

-- Adapted from English summary (Bull. Hyg.)

- 868 Build a Dust Hood for Drum Filling. P. R. Wiewandt. Chem. Eng. 65, 166, 168 (Apr. 21, 1958).

This article contains a sketch, drawn to scale, of a drum dust hood which is useful on a packaging line where broken and rejected packages of dusty material must be collected. The hood is used in connection with a dust collection system. The volume of air required for this purpose is small. For the size shown a flow of 150 cubic feet per minute of air will insure a 200 feet per minute velocity across the smallest open face of the cone. The hood is connected to the dust collection system by a 3-inch flexible hose, which, with the lightweight construction of the hood, makes it easy to move from drum to drum.

- 869 Determination of Crystalline Free Silica by Combined Chemico-Petrographic and Debye-graphic Methods. E. Occella. Med. lavoro 48, 597-603 (Nov. 1957). Italian.

The author has developed a method for the determination of the best conditions for the quantitative analysis of crystalline free silica in its allotropic forms, as part of mineral samples, synthetic products, and airborne dusts. A single method is not suitable for the study of all such materials; it was found convenient to use at least two analytical methods together, keeping thereby a constant control on the results. A preliminary mineralogical analysis may give conclusive evidence of the lack of free silica; otherwise it may give more or less the approximate level. When the approximation is not accurate enough, it is advisable to submit the sample to a chemical enrichment in free silica. The type and intensity of the chemical treatment will vary according to the quality and the particle size of the sample. The purity of the residue following the chemical treatment can be controlled petrographically very easily and with good approximation. A roentgen-diffractometric analysis is conveniently used when a quantitative determination of allotropic quartz forms is required and also when the sample cannot easily undergo a chemical treatment.

-- Cond. from English summary (Bull. Hyg.)

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- 870 Methods for the Determination of Crystalline Free Silica. E. Occella, N. Zurlo, and G. Frigerio. *Med. lavoro* 48, 604-612 (Nov. 1957). Italian.

Analytical methods applied to different samples for the quantitative determination of crystalline free silica are reported. For each one of them (preliminary and quantitative mineralogic examination, chemical analysis, roentgendiffraction analysis) conditions of operation, accuracy of results, time required by the analysis are indicated. Special attention is given to the study of airborne dusts. For these a combined chemico-petrographic or petrographic-debyeographic method seems to be the most appropriate to provide highly approximate and quick analytical results.

-- Cond. from English summary (Bull. Hyg.)

- 871 The Tomographic Aspects of Confluent Pictures in the Pneumoconiosis of Coal Miners. D. Belayew, J. Prignot, and F. Lavenne. Report No. 148, Institut d'Hygiene des Mines, Hasselt, Belgium. 12, No. 7, 35 pp. (Nov. 15, 1957). French.

In a previous communication (IHD Abst. 637, July 1957) the authors had discussed the location of incipient conglomerate shadows in the pneumoconiosis of 112 coal miners. In the present paper they study these lesions from the point of view of tomographic appearances. Results are given in detail. If homogeneity, sharpness of outline, and extent of the lesion can be accepted as criteria in the tomograms an agreement is apparent between radiographs and tomographs in about 80% of the cases. In about 7% tomography tends to correct the radiographic diagnosis.

-- Cond. from Bull. Hyg.

- 872 The Danger of Silicosis to Pottery Under-Glaze Painters. H. Otto and F. Winter. *Arch. Gewerbepathol. Gewerbehyg.* 15, 586-596 (1957). German.

A brief description is given of the work of the under-glaze decorator of pottery, who applies the color by brush or spray to the articles of pottery which have been subjected to a preliminary firing at 850°-1,000° C. Exhaust draft is provided to remove spray and dust, produced by scraping the raw porcelain, but it is not completely effective and the worker is exposed to the inhalation of particles of color and dust. Experiments are described in which mice received intraperitoneal injections of aqueous suspensions of six materials; these included white pigments, colored pigments of three types composed of metallic oxides, pigments with flow-material as used in decoration, two preparations of factory dust, and dust of the raw, porcelain body which was composed of about 50% clays, 26.5% quartz, and 21.5% feldspar. Some of the mice died within a few days of receiving the injection, partly from infection and partly, it was thought, from metallic poisoning. The results showed that the dust produced from the color and body of the ware in under-glaze decoration had a definite fibrogenic action, whereas the colors alone caused only a foreign body reaction with aggregations of cells, encapsulation and sparse fiber formation. The nodules produced by the factory dust varied in size, some being as large as those produced by quartz and with well marked fiber formation, but with strands spreading into the surrounding tissue, a feature not seen in the quartz nodules. The factory dust and the dust of the raw porcelain produced similar effects; the nodules were more diffuse than those of quartz. The lesions caused by porcelain dust appeared to be intermediate between those produced by quartz and glass dust. These results were in agreement with those found by other observers.

-- Cond. from Bull. Hyg.

- 873 Histological Observation on "Prenodular" Lesions in Pulmonary Silicosis. C. Puccini. *Med. lavoro* 48, 545-558 (Oct. 1957). Italian with English summary.

The silicotic nodule, generally regarded as the early and characteristic lesion, represents a phase in the silicotic process after many changes have already occurred in the lung tissue. The initial stages of this process are still not perfectly understood. This study is based on systematic histological examination of the lungs of stone dressers and pottery workers who died as the result of accident or intercurrent disease; there was no tuberculosis. The silica dust was widely distributed in the lung parenchyma and was partly phagocytosed by cells of the alveolar septa and respiratory bronchioles. This cellular reaction is regarded as inflammatory; it led to proliferation of histiocytes, interstitial edema and formation of reticular fibers and collagen. These accumulations of cells assumed

the form of granulomas, with reticulin fibers arranged round the masses of phagocytes, seen typically at the terminations of the respiratory bronchioles. Fibrotic changes also occurred in the lobules of the lung and spread to involve large areas which became progressively invaded by sclerotic tissue. These changes preceded the appearance of the typical hyaline nodule and could be described as prenodular lesions of silicosis, instead of linear fibrosis, which is characterized by interstitial accumulations of phagocytes and hyperplasia of reticular tissue, and corresponds with the radiographic appearance described as linear fibrosis.

-- Cond. from Bull. Hyg.

- 874 Biochemical Investigations on the Hyaline Tissue of Silicosis. 5. The Lipids. E. Clerici and B. Pernis. *Med. lavoro* 48, 449-457 (Aug.-Sept. 1957). Italian with English summary.

The amount of total lipids directly extractable by organic solvents contained in fibrohyaline tissue of silicotic masses is several times higher than that contained in other hyaline tissues. These lipids include: phospholipids, cerebroside, free and esterified cholesterol and neutral fats. Quantitative determinations, expressed in percentage of protein weight, showed that silicotic tissue contains twice as much cholesterol and only one half cerebroside as compared with normal lung. The latter finding suggests the possibility that at least some of the lipids of silicotic masses derive from the precipitation of serum lipoproteins in the tissue: serum lipids in fact consist mostly of free and esterified cholesterol, while no cerebroside is present in them. Silicotic masses also contain a lipid fraction that can be extracted by organic solvents only following hydrochloric acid hydrolysis. X-ray spectographic analysis shows that they are fatty acids similar to those strictly bound to reticulin fibers. The same fatty acids, although to a lesser extent, are obtained after hydrochloric hydrolysis of normal lung.

-- Bull. Hyg.

- 875 The Fibrogenic Activity of Amorphous Silica. H. Osanai. *J. Sci. Labour (Tokyo)* 33, 611-616 (Aug. 1957). Japanese.

Hitherto it has been considered that the pathogenesis of silicosis is dependent on the crystalline structure of silica. Experiments were performed to verify this crystalline structure theory of silicosis by examining the changes of the lymph nodes. For this purpose, amorphous silica particles smaller than 1 micron, were used. They were prepared by burning the tetraethyl-orthosilicate, and showed no crystalline patterns by x-ray diffraction. The suspension of this amorphous silica was injected intratracheally into the rat's lung, and the chest nodes were examined. Histological observations were made 1 month, 3 months and 6 months after the infusion. At the end of the first month, only the proliferation of reticulum cells could be observed. After 3 months there appeared proliferation of reticulum cells and some collagenous fibers, and after 6 months thick collagenous fibers appeared in abundance. These changes are the same as the changes caused by quartz, and accordingly it seems that this amorphous silica has fibrogenic activity similar to that of quartz, on the lymph nodes of rats. This result suggests that it is important to make further investigations on silicosis caused by amorphous silica.

-- Cond. from English summary (Bull. Hyg.)

- 876 Physical Working Capacity and Exercise Electrocardiograms in Pulmonary Diseases. G. Dahlstrom. *Acta Tuberc. Scand.* 34, 226-235 (1957).

The author describes a method for determining the working capacity of a group of 171 males and 56 females having tuberculosis and of 16 patients having silicosis. The subjects exercised for 6 minutes on a bicycle ergometer set at 100 or 200 kg. m. per minute and their pulse and respiration rates were counted. The load was then increased in steps of between 100 and 300 kg. m. per minute, the subject working for 6 minutes at each load until the pulse rate reached 170 or the respiration rate exceeded 30 per minute. This load was taken as the working capacity. No normal range of working capacity is given, but it is suggested that normal men should be capable of at least 900 kg. m. per minute and few women 200 kg. m. per minute. There was a significant correlation between both vital capacity and maximum voluntary ventilation, and working capacity but not between residual capacity (as per cent of total lung capacity) and working capacity. In the second

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part of the paper the results of resting and exercise electrocardiograms on 155 patients are compared and some additional abnormality was detected in 17 of those taken during and after exercise. It is concluded that measurement of working capacity may disclose some cases of impaired physiological function with normal vital capacity or maximum voluntary ventilation, and that the exercise electrocardiogram may occasionally reveal abnormality not shown at rest.

-- Adapted from Bull. Hyg.

- 877 Acetazolamide (Diamox) in the Treatment of Silicosis with Severe Chronic Respiratory Insufficiency. A. Agnoletto and N. Moreschi.
Med. lavoro 48, 613-620 (Nov. 1957). Italian with English summary.

The authors tested the value of acetazolamide in silicosis patients with respiratory insufficiency. Eleven silicotic patients under treatment in the clinic, 12 normal subjects and 8 patients with uncompensated heart disease, excluding cor pulmonale, were given acetazolamide in doses of 250 or 300 mg. daily for 10-15 days continuously or in periods of 2 days at intervals of 2 days. The drug was given in the morning to the patients fasting, and other treatment and diet were continued as before. Under acetazolamide therapy the alkaline reserve showed a marked decrease; normal blood levels of sodium and potassium were maintained, diuresis was increased, when compared with normal subjects and cardiac patients receiving acetazolamide; and the pH of the urine was modified toward alkalization. The drug was well tolerated by all patients. Three of the silicosis patients who had to use inhalations of oxygen were able to reduce the amount of oxygen and to leave it off for long periods. Five of the silicosis patients showed subjective and objective improvement; lethargy and anxiety were relieved, mental acuteness was increased, cyanosis and dyspnea were diminished, and the oxygen content of the blood was improved. The mode of action of acetazolamide is explained as a stimulating effect on the respiratory center, increasing pulmonary ventilation and elimination of carbon dioxide.

-- Cond. from Bull. Hyg.

- 878 Dust from Cement Works. The Question of its Influence on Health. J. H. Hudson.
Med. Officer 98, 351-356 (Dec. 20, 1957).

The author presents a considerable amount of information on the subject from the literature, and from his own local knowledge and experience as Medical Officer of Health of Dartford Borough and Rural District, Kent, which is in the largest cement manufacturing district in Great Britain. He considers that no evidence is found of direct harmfulness to health, but the spreading of cement dust on the surrounding dwellings is undoubtedly a nuisance. In the present case cement is manufactured from a slurry of chalk and clay which is heated in a rotary kiln fed with pulverized coal. Hot gases passing towards the chimney pick up particles of chalk and clay which are carried up with the furnace gases. About 98% of the solid particulate matter is arrested chiefly by electrostatic precipitation, the remaining 2% escaping into the atmosphere. The direct effect on health is discussed. There is no evidence of a higher incidence of catarrhal affection in school children in the cement area. The incidence of lung cancer in the cement districts is markedly lower than in nearby London. The cement districts have a crude death rate for respiratory disease which is less than that of the smallest urban areas. The author suggests that in the cement districts the chalk and lime suspended in the air may adsorb oxides of sulfur from smoke and thus reduce its harmful effects. A closer study of the records of health, sickness and death is required for estimating the effect of cement works flue dust on the health of the general community.

-- Cond. from Bull. Hyg.

- 879 Is Coke Dust Injurious to Health? G. Worth and E. Schiller.
Arch. Gewerbepathol. Gewerbehyg. 15, 597-610 (1957). German.

The authors describe clinical and radiological examinations of coke workers, and animal experiments to determine the effects of coke dust on the lungs. Details are given of procedure and results of clinical and radiological examinations of 87 men, of average age 51.8 years and 26.6 years employment in coking plants, without previous employment in dusty occupations. Radiographic changes were limited to evidence of

early pneumoconiosis in 2 men, with increase of root shadows and linear striation, and slight, fine stippling in the middle zones of the lungs. There was evidence of bronchitis in 15 men. Emphysema was of more frequent occurrence; it was slight in 31 cases and of moderate severity in 9 cases. Mice were used in the animal experiments. The animals were divided into 11 groups. Intraperitoneal injections of dust of coke or coking coal were given in 9 groups, and dust of chamotte refractory material from the lining of coke ovens in 2 groups. The dusts of the coals and cokes produced collections of histiocytes and fibroblasts after 180 days; at 300 days the coals had produced granulomas with collagen. From the coke dusts, after 180 days, the most marked changes were concentrically arranged fibers with coke dust enmeshed between the layers. The chamotte dust showed fibroblastic reaction after 60 days. The slight tissue changes produced by the test materials even after 300 days corresponded with the low quartz content of the coking coals. Intratracheal experiments on rats had shown severe catarrhal inflammation and acute edema of the lungs. It was a question of how far the clinical evidence of bronchitis in coke workers was connected with the alkali released from the coke.

-- Cond. from Bull. Hyg.

- 880 The Disposal of Coal and Hematite Dusts Inhaled Successively. A. G. Heppleston. J. Pathol. Bacteriol. 75, 113-126 (Jan. 1958).

Experiments were carried out on rats and rabbits. Dusts of hematite ore and coal, of particle sizes 0.5-5 microns were administered by inhalation in chambers, exposures usually lasting 20 hours per day on 5 days a week; concentrations for rats were about 37,000 particles per ml. of hematite and 10,000 per ml. of coal. For rabbits the concentration was about 20,000 particles for both dusts. The rats and rabbits were exposed to hematite or coal for several weeks, and, after an interval of up to 6 months, received the other dust. The lungs were prepared for examination by ligation of the trachea and removal of the whole thorax which was placed in formol-saline. Control experiments showed that neither the hematite nor the coal dust used was fibrogenic. The fate of the two dusts in the lung was similar, apart from a slight excess of coal dust removed via the lymphatic system. The results of the successive exposure to hematite and coal dusts in rats showed that elimination of the first dust from the lungs was not encouraged by a prolonged and intense exposure to the second dust. The double exposures appeared to have a simple additive effect of the total quantity of dust retained in the lungs. In rabbits, after the successive exposures, foci of dust developed, and were better defined and more compact the longer the rabbits survived the exposures; also the mixing of the two dusts was more even in a given focus. No dust was seen in lymphatic vessels; the intrapulmonary lymphoid tissue usually showed a few small accumulations of both dusts. Hilar glands contained collections of dust, the first dust tending to lie at the center and regularly exceeding the second dust in quantity. The influence on dust disposal of intercurrent inflammatory processes in the lungs was also studied. Acute pneumonia facilitated dust elimination, but the evidence on the effect of rat bronchiectasis and endogenous lipid pneumonia was not so conclusive.

-- Cond. from Bull. Hyg.

- 881 Serum Iron Levels in Siderosis Due to Habitually Excessive Iron Intake. J. Higginson, K. J. Keeling, M. Andersson, and A. R. P. Walker. J. Clin. Invest. 36, 1723-1725 (1957).

Serum iron levels and the severity of siderosis as determined by liver biopsy were correlated in a series of 26 South African Bantu adults and one child derived from a population known to be habituated to an excessively high iron intake. The correlation between mean serum iron levels and the degree of siderosis was highly significant if the patients were divided into groups with and without significant iron deposits. There was, however, no correlation between the serum iron levels and the severity of siderosis, once significant iron deposition was present in the liver.

-- Chem. Absts.

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882 Serum Iron Levels in Pneumoconiosis in the Ore Mines of the Upper Palatinate.

H. J. Diesfeld. Arch. Gewerbepathol. Gewerbehyg. 15, 611-637 (1957). German.

This is a very detailed study of the iron content of the blood serum found in iron workers at Sulzbach, in the Upper Palatinate, Bavaria. An attempt is made to relate the iron content of the blood serum to radiological diagnosis. Environmental studies showed 95% atmospheric humidity, low dust counts, and 1 to 2% quartz and 2% lime in the ore. The low dust concentrations are explained by the high atmospheric humidity and moisture content of the ore. Clinical examination included determination of the iron content of blood serum, other blood examinations, history of occupational exposure, and radiographic diagnosis of silicosis. The results are tabulated. Erythrocyte, hemoglobin, and color index values were close to normal. A definite parallel was established between the radiographic findings and the iron content of the blood serum. The serum-iron values are solely expression of the partial breakdown of iron deposited in the lungs; the radiological changes are independent of these and retain their importance for diagnosis and evaluation of the degree of pneumoconiosis. Silicosis was infrequent except after prolonged exposure and had not progressed beyond stage 2. The serum-iron content of 47 pneumoconiotic workers averaged 160 microgram %, in comparison with 127 microgram % in healthy unexposed workers. This increase was proportional to the degree of exposure to the ore dust and to the lung changes. Pneumoconiosis, with reference to the dusts of iron and stone, silicosis, siderosis, and the differential diagnosis of these diseases are discussed.

-- Cond. from Bull. Hyg.

883 An Epidemiological Study of Lung Cancer in Asbestos Miners. D. C. Braun and

T. D. Truan. A.M.A. Arch. Ind. Health 17, 634-653 (June 1958).

Reprints available from the Foundation.

Records were obtained on 6091 asbestos miners in Quebec having at least five years of exposure and who were in the industry in 1950. Of the 187 known dead, cancer of the lung was considered to have been reasonably proved in 9 and to be strongly suggested in 3. The mortality rate on the basis of the "proved" deaths was 25.3 per 100,000, and on the basis of the 12 deaths was 33.8 per 100,000. The mortality rate from lung cancer does not appear to increase with length or degree of exposure. Comparison of the experience among the asbestos miners with that of various segments of the unexposed, comparable population shows that the observed number of deaths among the miners is not significantly greater than the expected number. The death rate from cancer in the areas contiguous to the asbestos operations is comparable to that in areas widely scattered throughout the Province of Quebec and is lower than in some urbanized areas within the Province. It would also appear from available data, that the world-wide experience of persons exposed to asbestos dust is not worse with respect to lung cancer than that of the unexposed population.

-- Cond. from authors' summary

884 Contribution to the Study of Byssinosis. M. Gonzalez-Ribas and J. Del Molino Mateus.

Med. y seguridad trabajo 5, 48-50 (July-Sept. 1957). Spanish.

The authors made a study of 6,000 employees of cotton mills of whom 619 suffered from bronchial trouble. Of these bronchitis subjects 30% were between the ages of 15 and 25, 40% between 26 and 40 and 30% between 41 and retirement age. The sex distribution was 7.76% of the men employed and 6.48% of the women. There were fewer cases of chronic bronchitis where the dust was dense than where it was less dense. Typical byssinosis is seldom seen before six years' exposure to the dust. The four stages of byssinosis are: (1) irritation bronchitis with cough, general malaise and loss of appetite; (2) the typical bronchitic phase with the "Monday syndrome", cough crises, dyspnea, and headache; (3) typical chronic bronchitis with all symptoms aggravated; and (4) development of complications causing the patient to give up his work. Two typical cases are described, one with symptoms mainly respiratory and in the other mainly digestive. There is a good description of the "Monday syndrome", i.e., a reappearance of marked symptoms within 2 or 3 hours of returning to work on a Monday or after a holiday.

-- Cond. from Bull. Hyg.

- 885 Hygienic Conditions in a Laminated Wood Factory. R. de Rosa and M. M. di Bosco. *Riv. ital. igiene* 17, 348-367 (July-Aug. 1957). Italian with English summary.

This is a detailed report on the sanitary conditions found in a factory making a form of laminated plywood paneling from wood chips. A dust hazard was found at the various saw benches, and as a result of defective aspiration of the acrid fumes of the resins and glues used for bonding the sheets of wood chips there was irritation of the eyes and upper respiratory passages. In the 64 employees examined chronic broncho-pulmonary disease was the most common condition, followed by catarrhal conjunctivitis; a number had varicose veins and this condition was attributed to the fact that none of the work was performed sitting down. Irritation of the eyes and bronchi was found mainly among those employees in the pressing section where pressures up to 150 atmospheres were applied under steam.

-- Cond. from Bull. Hyg.

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 886 Recorded Group Audiometer Test Comparisons at the 1956 Southern California Exposition. J. C. Webster and P. O. Thompson. *J. Acoust. Soc. Am.* 29, 895-899 (Aug. 1957).

Recorded series of 4000 cps absolute threshold tests were administered over earphones to 1919 persons in groups of 8 or less. The results suggest that: (1) test-retest liability is increased by increasing the number of attenuation steps within a given hearing loss range; (2) use of fewer and larger tests tends to make hearing loss scores larger; (3) warble tones are interchangeable with pure test tones as test stimuli; and (4) left ears tend to show greater hearing loss. The results of this survey as a function of age agree reasonably well with results of other recorded-test hearing surveys, but not so well with survey results obtained with clinical audiometers. -- Editor's summary

- 887 On the Effect of Practice and Motivation on the Threshold of Audibility. J. Zwislacki, F. Maire, A. S. Feldman, and H. Rubin. *J. Acoust. Soc. Am.* 30, 254-262 (Apr. 1958).

The thresholds of audibility for 100 and for 1000 cps have been measured on five groups of originally naive listeners by various experimental techniques. All the experiments showed improvement of the threshold with practice. The improvement was greater at 100 cps than at 1000 cps. Pretraining at 1000 cps did not affect the threshold change at 100 cps. The improvement of the threshold with practice was enhanced considerably by reward and feedback.

-- Editor's summary

- 888 Masking of Speech by Noise at High Sound Levels. I. Pollack and J. M. Pickett. *J. Acoust. Soc. Am.* 30, 127-130 (Feb. 1958).

Speech intelligibility was examined at high noise levels for a range of speech and noise spectra. Over a wide range of conditions, deterioration of speech intelligibility was observed with a constant speech-to-noise ratio at high noise levels. Little change in intelligibility was observed for over-all speech levels to 130 db in the absence of background noise. Control tests ruled out distortion within the equipment as the factor associated with the loss of speech legibility.

-- Editor's summary

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- 889 Limits of Direct Speech Communication in Noise. J. M. Pickett.
J. Acoust. Soc. Am. 30, 278-281 (Apr. 1958).

Person-to-person tests of sentence intelligibility were carried out in low frequency and white noise at noise levels ranging from 85 to 118 db. Talkers attained shouting levels of vocal effort but the maximum tolerable noise levels for 90% sentence intelligibility and 1 meter between talker and listener were estimated to be 95 db for white noise and 105 db for low-frequency noise. -- Editor's summary

- 890 Speech Intelligibility at High Noise Levels: Effect of Short-Term Exposure. I. Pollack.
J. Acoust. Soc. Am. 30, 282-285 (Apr. 1958).

Successive work intelligibility tests were executed at a constant speech-to-noise ratio over a 13-minute period for a range of white noise levels between 45 and 130 db. Speech intelligibility declined over the test period as a result of continued exposure to noise levels of 115 db and higher. Interactions among different noise levels on successive tests, as evidenced by speech intelligibility scores in noise, were minimal when the noise levels were separated by less than 80 db. -- Editor's summary

- 891 Noise Exposure Evaluation (Auditory Effects). E. W. Poth and C. J. Weinberg.
Am. Ind. Hyg. Assn. J. 19, 84-88 (Apr. 1958).

Data now available on the relation between noise exposure and hearing loss are excellent when used by an expert, but the average industrial hygienist is no such expert. He needs exposure values which express time-intensity relationships in terms of single numbers that will constitute bench-marks or guide lines. The author derives an equation for EET (equivalent exposure time), and presents a nomogram which will simplify calculation. A number of factors in the establishment of threshold limit values on that basis are discussed. The author concludes that the EET values provide a very handy tool for noise evaluation and selection of proper ear protection. In order to calculate noise exposure in EET, both the noise intensity in octave bands and the time duration of each intensity is required. To obtain these types of data the industrial hygienist is forced to make a thorough evaluation of the noise environment.

Critique. K. C. Stewart. Ibid 88, 89.

The method outlined above is closely allied with the noise dose concept previously presented. Some differences between the two are discussed. For both the EET and noise dose concepts, validating data are required before the technique for hazard prediction is accepted. This is also true for the present octave band techniques.

- 892 Temporary Threshold Shift as a Function of Noise Exposure Level. W. J. Trittipoe.
J. Acoust. Soc. Am. 30, 250-253 (Apr. 1958).

There is no general tendency for the temporary threshold shift either to level off or to decrease following exposure to higher sound levels; however, apparently, a very small minority of persons will show a decreasing temporary threshold shift with increasing intensity. -- Author's conclusion

- 893 The Study of Noise in Mines. J. Carmichael. Mining Equipment 8, 23-30 (Nov. 1957).

Sound level meters and indicators can be used in mines to determine the total noise intensity at various processes and machines, and recently work has been done in analyzing such noise by playing back the tape recordings in the laboratory. This was of special value in determining the type of warning signs to be used; a table gives the effectiveness of various warning devices, and curves are shown with the sound levels required for such devices. Prevention of injury from noise can be secured by reducing the amount of noise produced by machines through attention to mechanical defects, the use of extra lubrication or enclosure of the machine. Unusually susceptible persons can be detected by audiometric tests early in their career and steered away from noisy jobs, and the extent and nature of injury to hearing can similarly be determined by these tests. Personal protection may be given by the use of ear plugs or ear muffs. -- Cond. from Bull. Hyg.

- 894 Practical Aspects of a Hearing Conservation Program. L. B. Shone.
A.M.A. Arch. Ind. Health 17, 610-613 (June 1958).

The practical aspects of a hearing conservation program for use in industrial plants are presented. The following subjects are briefly described: noise measurement and analysis; engineering noise-control measures; audiometry; preplacement or pre-employment hearing examinations; periodic hearing examinations; personal ear-protective measures; and education for acceptance of ear protection.

-- Cond. from author's summary

- 895 Noise Shield for Microphones Used in Noisy Locations. M. E. Hawley.
J. Acoust. Soc. Am. 30, 188-190 (Mar. 1958).

A rubber noise shield was developed which significantly improves the speech-to-noise ratio at a military microphone. The construction and evaluation techniques are described, and the advantage of introducing acoustic damping material is shown.

-- Editor's summary

- 896 Noise and Vibration Control—Extra Safety Factors. S. D. Fox and F. H. Ulm.
Natl. Safety News 77, 22-25 (June 1958).

The experience of Delco-Remy Division of General Motors Corporation in noise control is reviewed. Audiometric tests on new employees and others in the course of examination, and frequent noise surveys are features of the program. Specific applications described briefly and illustrated include: a homemade muffler, commercial mufflers, automatic screw machine, foundry wheelabrator, padded hopper, solution tank, muffled punch press, applications of a vibration damper, and enclosure of syntron feeders.

- 897 Improved Cushion for Ear Defenders. E. A. G. Shaw and G. J. Thiessen.
J. Acoustic Soc. Am. 30, 24-36 (Jan. 1958).

Circumaural ear defenders require a cushion which is highly adaptable to the irregular contours of the head so as to provide a good air seal, and yet behaves like a stiff spring so as to minimize low-frequency cup vibration. These apparently contradictory requirements are met by a cushion consisting of an annulus of highly flexible yet rather inextensible material partly filled with an incompressible fluid. A theory of cushion behavior is given and is supported by experimental data. Experiments with real heads show that the attainable low-frequency attenuation is limited by the viscoelastic properties of the flesh. Values of circumaural flesh impedance derived from the experimental data are compared with the mastoid data of other workers, and the relationship between sound transmission and threshold shift data is discussed. The design of a rigid cup and flexible frame suitable for use with the cushion is also discussed.

-- Editor's summary

- 898 Speech Communication at High Noise Levels: The Roles of a Noise-Operated Automatic Gain Control System and the Hearing Protection. I. Pollack.
J. Acoust. Soc. Am. 29, 1324-1327 (Dec. 1957).

Two aids for hearing conservation, a noise-operated gain control system and an insert ear protection, were evaluated in terms of speech intelligibility. At high noise levels, these aids not only do not interfere with the speech intelligibility, but they may also substantially improve speech intelligibility while affording hearing protection.

- 899 Help for Aging Eyes. M. Ross. Natl. Safety News 77, 47, 115 (June 1958).

Persons over 45 or 50 who wear bifocals are often unable to see distinctly in the middle distance ranges (roughly 15 to 30 inches) and are subject to accidents for that reason. This condition can be corrected by wearing trifocals. Three case histories are presented showing the benefits of trifocals.

RADIOACTIVITY AND X-RADIATION

- 900 Ventilation in the Atomic Energy Industry. The Hazard from Inhaled Radioactive Substances. C. N. Davies. *J. Inst. Heat. Vent. Engrs.* 25, 229-243 (Jan. 1958).

Exposure to atomic radiations may arise from the radiation from external sources or from sources which have entered the body by ingestion or inhalation. Methods of protection against external radiation and the estimation of external dosage are briefly explained. Occupational exposure is reckoned to be safe if genetic effects are negligible up to the age of 30, and if there is little chance of contracting leukemia by the age of 60. Cancer of the lung in uranium miners is believed to have been caused by internal radiation. The radiation dosage calculated from the radon gas which they inhaled is inadequate to account for their illness unless additional radiation from the solid daughter products of radon is allowed for. The principles underlying the safe operation of reactors and associated chemical plant are outlined. The calculation of the permissible dosage of internal radiation is complicated. The accepted figures provide definitions of maximum permissible levels for total body burden, for the concentration in air and for the concentration in drinking water. Uranium can be handled with precautions similar to those which have long been used for toxic chemicals, since the allowable airborne concentrations are of the same order. Strontium-90 and plutonium-239 require a completely different approach to the problem of safe manipulation because the allowable concentrations for these are only one-millionth of the concentrations permissible for uranium. Methods of measuring body burden and air concentration are mentioned. There is a correlation between the concentration in air and the amount of surface contamination. The latter is the more easily measured, and safe working limits in terms of surface contamination have been proposed.

-- Cond. from Bull. Hyg.

- 901 Uses of Radiation-Producing Equipment and Radioactive Material in New York State Industry. A. P. Abrahams. *Monthly Rev. N. Y. State Dept. Labor* 36, 37, 38, 41-47, (Oct., Nov., Dec. 1957).

There are 320 registered industrial radiation installations in New York State, involving 3130 pieces of radiation-producing equipment and 40,240 curies of radioactive material, in addition to a considerable quantity of classified material. The sources and radioactive materials are tabulated and discussed, under the following headings: industrial radiography and fluoroscopy; spectrometric and crystallographic applications of x-rays; radioactive static eliminators; medical x-ray units; gamma radiography; stray radiation from high-voltage equipment; sealed and unsealed radioactive materials; neutron sources; uranium mining, milling, and processing; nuclear reactors and particle accelerators; and radio-activated materials. The hazards and control measures for each of these sources are discussed. A number of small users of radiation sources are seeking non-radiation methods for performing the same functions. On the other hand, the use of radiation sources will probably expand, and therefore the magnitude of the problem of radiological health protection can be expected to increase.

- 902 Industrial Health in the Atomic Energy Industry. J. H. Sterner. *A.M.A. Arch. Ind. Health* 17, 659-664 (June 1958).

The health and safety programs and accomplishments in the atomic energy industry in the United States are reviewed. Among the principal hazards are exposure to radon and its daughter products, uranium, plutonium, beryllium, and others associated with the operation of nuclear reactors. The hazards in any manufacturing process are also present; however, the death rate for the atomic energy industry for the years 1943-1955 was exactly

half that reported by National Safety Council members. During the 13-year period there were 184 fatalities in atomic energy installations, only 2 of which were caused by radiation. In a corresponding period, 69 injuries were caused by overexposure to radiation. A considerable number of these injuries were associated with the development and testing of atomic weapons. This good safety record is attributed to the health protection program, one of the most essential elements of which is monitoring of exposed personnel. The delayed and insidious effects of radiation will require a much longer period of observation and an intensified investigative program, but experience to date gives a considerable degree of assurance that the present criteria and performance provide the means for a safe and healthful working environment in the atomic energy industry.

- 903 Nuclear Safety and Industrial Hygiene in the Fabrication of Nuclear Fuel Elements. W. B. Harris and L. R. Solon. *Am. Ind. Hyg. Assn. J.* 19, 101-106 (Apr. 1958).

Industrial experience with the production of enriched fuel elements is reviewed briefly. Essential factors for the prevention of criticality incidents are outlined and discussed, and general criteria are given for the insurance of nuclear safety and health protection. Descriptions of specific processes and processing equipment are included, as are airborne concentrations which might be expected to result from the use of this equipment. -- Editor's summary

- 904 Respiratory Problems in Atomic Energy Practice. G. W. C. Tait and T. H. Byington. *Am. Ind. Hyg. Assn. J.* 19, 123-125 (Apr. 1958).

The history and present practice of respiratory protection at Canada's Atomic Energy Project at Chalk River are presented. The problems encountered and solved included leakage, difficulties in speech transmission, and administration. Work in heavily contaminated areas will continue to give some evidence of internal contamination despite the most careful respirator program. A reduction to one-half to one-fifth is the most that can be expected, on account of inevitable human failures and the entry of small quantities of radioactive matter by other routes than through the respirator. Nevertheless these considerations must strengthen rather than weaken the case for a sound respirator program.

- 905 Changes in the Lungs and Other Organs after Intratracheal Introduction of Radioisotopes (Na^{24} , P^{32} , Au^{198}). T. A. Kotschekowa and G. Awrunina. *Arch. Gewerbepathol. Gewerbehyg.* 16, 24-33 (1957). German.

This experimental study deals with the fate of white rats after intratracheal injections of radioactive sodium in the form of sodium chloride, and of radioactive phosphorus as the insoluble chromium phosphate, and colloidal gold. Most of the radiation from these substances is of the beta type which would be expected to produce local tissue effects rather than generalized effects; this proved to be the case though death occurred with the phosphorus and gold injections much sooner than with the sodium. This was not due to higher dosage but to the insolubility of the product which led to more prolonged local action; death occurred sooner under these circumstances. Some of the rats injected with sodium lived as long as two and one-half years. Control injections with non-radioactive salt produced no lesions. Varieties of lung tumors were found in the rats injected with the phosphorus and gold but were absent in the rats injected with sodium and examined for periods up to 18 months. The paper stresses the dangers of an insoluble substance deposited in lung tissue. -- Cond. from Bull. Hyg.

- 906 New Film Badge Enables Cheaper X-Ray Monitoring. L. H. M. van Stekelenburg. *Nucleonics* 16, 83-86 (June 1958).

A universal film badge that indicates x-ray dose with a single reading is described. The same film badge can be used for x-rays and gamma rays. The badge contains two differential films, one shielded on both sides by 2-mm. tin and the other directly exposed. The advantages of the two-film badge and the choice of appropriate films are discussed.

- 907 Instrument Developments in Health Physics. F. E. Adley.
Am. Ind. Hyg. Assn. J. 19, 75-79 (Apr. 1958).

The performance characteristics and construction features are described for several instruments that were developed for specific applications in industrial hygiene in the nuclear energy industry. Two monitors, an automatic particle sampler and a nitrogen dioxide recorder, are discussed. An apparatus for testing respirator performance is shown. A reciprocating attachment for the random collection of particles by electrical precipitation is mentioned. Also reviewed are a microscope attachment for locating radioactive particles and a device for increasing the rapidity of manually measuring particle sizes from micro-projections.

-- Editor's summary

- 908 Radiation—The Fourth "R". J. D. Saul. Natl. Safety News 77, 26, 27, 34, 35, 84, 86, 90 (June 1958).

A course in radiation safety, planned by National Safety Council, was conducted at Argonne National Laboratory. The subjects taught included external and internal exposure, monitoring and sampling, site location, laboratory equipment, waste disposal, decontamination, shielding, and instrumentation. The course was designed for the plant safety man who knew nothing of radiation safety. Every man who completed the course went back to his job feeling that now he knew something, and knew where to begin. With that knowledge, he was also able to discount sensational statements about the dangers of atomic installations.

- 909 Criteria for Establishing Short Term Possible Ingestion of Fallout Material. G. M. Dunning.
Am. Ind. Hyg. Assn. J. 19, 111-120 (Apr. 1958).

The criteria for establishing permissible ingestion of radioactive fallout material under emergency conditions for several weeks following a nuclear detonation are dependent primarily on exposures (1) to the gastrointestinal tract from the gross fission product activity, (2) to the thyroid from the isotopes of iodine; and (3) to bone, principally from strontium-90-yttrium-90, strontium-89, and barium-140-lanthanum-140. Data on these effects are presented and their biological significance is discussed. Some of the possible effects are summarized in a table and discussed in terms of permissible intake. Rules are suggested by which the least contaminated foods are used first, and preference in their use is given to children. If the degree of contamination of an area is such that the external gamma exposure would permit normal and continuous occupancy after a fallout, the internal hazard would not deny it.

- 910 Statement on Radioactive Fallout. Advisory Committee on Biology and Medicine. G. Failla, Chairman. Am. Scientist 46, 138-150 (June 1958).

The radioactive fallout problem is discussed in detail with references to the report of the Committee on the Biological Effects of Atomic Radiation of the National Academy of Sciences. The discussion includes: the accumulation of strontium-90 in soil, milk, and human bones, its possible damage in the forms of genetic damage, leukemia, and bone tumors; and the recommended upper limit of 10 r in 30 years for the genetic dose to the population of the United States. Although the dose from nuclear explosions is small in relation to the total radiation from other sources, the estimate of ultimate damage to the world's present and future population is large enough to cause concern by the public. In terms of national security, necessary tests of nuclear weapons are justified; however, in view of the adverse repercussions caused by these tests, the Committee recommends that tests be held to a minimum consistent with scientific and military requirements and that appropriate steps be taken to correct the present status of confusion on the part of the public.

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- 911 Radioactive Particles in the Air at Cincinnati, Ohio. R. L. Bradshaw and L. R. Setter. Public Health Repts. 73, 431-438 (May 1958).

Continuous air sampling was conducted for two periods totaling about 2 months in 1955 following nuclear detonations in Nevada. Measurements by autoradiographs and gross internal proportional counting indicated that maximum and average concentrations of beta activity in 47 samples were 30 and 5 micromicrocuries per cubic meter of air, respectively. For comparison, the maximum permissible levels for unknown radioisotopes beyond the control area is 1,000 micromicrocuries per 10 cu. m. of air. The average number of radioactive particles was 6.7 per 10 cu. m. of air. The weighted average beta activity of these particles was 37 micromicrocuries per 100 cu. m. of air. By means of a cyclone separator followed by a filter, particles were separated into two fractions, simulating retention by the upper and lower respiratory system of man. Generally the large particles would be rapidly eliminated by the human system. In roughly half the samples tested, these particles had a gross beta activity of 25 to 500 micromicrocuries. The activity of the finer particles, representing those which would penetrate to the lung alveoli, was usually less than 5, and did not exceed 25, micromicrocuries per particle.

-- Cond. from authors' summary

ENVIRONMENTAL MEASUREMENTS

- 912 Multi-Cycle and Long Cycle Automatic Impinger Sampling. W. J. Whitsell. J. Air Poll. Control Assn. 7, 120-122 (Aug. 1957).

The design of an automatic sampling instrument for use in air pollution studies is described. Special attention is given to the materials of construction and the equipment required for sampling periods of 1 hour to 12 hours for unattended durations of one week. The method of sampling employs the principle of liquid impingement adapted from the Greenburg-Smith impinger. A liquid reservoir, leveling reservoir, dispenser, valve, spray traps, etc., are pictured schematically and the text describes the materials used and the methods of construction and operation. A total of 40 samples can be collected during one cycle of operation. The problems and solutions to adverse weather effects, such as freezing temperatures, condensation, and corrosion, are described.

-- Public Health Eng. Absts.

- 913 Collection of Integrated Samples of Gaseous Effluents. R. S. Brief and Philip A. Drinker. A. M. A. Arch. Ind. Health 17, 654-658 (June 1958).

A method has been developed for collecting gaseous samples of effluents from both cyclic and continuous industrial operations. The equipment is simple and easily operated to give samples which can be analyzed by mass spectrometry. The sampling and analytical techniques described were used satisfactorily in a survey of a synthetic rubber plant. On account of the highly reactive nature of the gases sampled, it was necessary to construct the apparatus entirely of glass. The total emission of organic materials was found to be of the order of 10 tons per day, which agrees with a material-balance estimate of these emissions within 6%. The field use of this method has indicated that it may be easily adaptable to other similar applications.

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- 914 Colorimetric Determination of Residual Perchloroethylene in Fumigated Wheat. J. H. Brumbaugh and D. E. Stallard. J. Agr. Food Chem. 6, 465-467 (June 1958).

The use of tetrachloroethylene in fumigants to control insect infestation in grains makes it necessary to determine the residual amount of this compound present after fumigation. A simple, sensitive colorimetric method for determining small amounts of perchloroethylene in wheat, utilizing a new-found color reaction of perchloroethylene with pyridine, aniline, and sodium methylate, is presented.

-- Editor's summary

- 915 Determination of Trichloroethanol in the Urine after Exposure to Trichloroethylene. D. Vlachova. *J. Hyg. Epidemiol., Microbiol., Immunol.* No. 1-2, 225-229 (1957).

A method is described for the determination of trichloroethanol in a mixture of trichloroacetic acid and urine. The procedure is particularly adaptable to individuals exposed to trichloroethylene which is metabolized to trichloroethanol and to its narcotic effect. The determination of trichloroethanol in urine of exposed individuals is of considerable importance for the assessment of the state of health of the person concerned. It was pointed out that trichloroethanol split off from triethanolglucuronide by potassium chromate oxidation, and trichloroacetic acid produced by oxidation of trichloroethanol can be determined. The difference in values indicates the amount of trichloroacetic acid equivalent to trichloroethanol present. As little as one microgram of trichloroethanol in 1 cc. of urine can be detected by the method. The procedure is time-saving and is also easy to conduct.

-- Chem. Abstrs.

- 916 Determination of Allethrin Residues in Milk and Meats. D. B. McClellan and J. B. Moore. *J. Agr. Food Chem.* 6, 463-465 (June 1958).

A method accurate to 0.1 ppm is presented to determine allethrin in the milk or meat tissues of domestic farm animals, which have been subjected to a concentrated allethrin spray. The determination involves solvent extraction of the tissues, concentration, and reaction with highly acidic mercuric oxide-sulfuric acid to produce a red color. The color developed follows Beer's law and can be measured colorimetrically. Allethrin was not found in the milk of dairy cows, which had been sprayed daily for three weeks, or in the meat tissues of a female goat that had been sprayed daily for five weeks—all with a large overdose of the spray.

-- Editor's summary

- 917 Nuclear-Track Technique for Low-Level Plutonium in Urine. L. C. Schwendiman and J. W. Healy. *Nucleonics* 16, 78, 80-82 (June 1958).

A nuclear-track-emulsion technique for the determination of small quantities of plutonium in urine is described. The plutonium, after separation from the urine sample, is electrodeposited on a metal disk. The disk is held against a nuclear-track emulsion for 168 hours. After emulsion development, tracks are counted under a microscope. The detection limit of less than 0.05 dpm currently achieved on a routine basis is low enough to permit early recognition of low-level plutonium deposition. This technique is used exclusively at Hanford for routine bioassay. Workers are examined one to four times a year depending on exposure potential. A note on emergency cases states that when plutonium is known or suspected to have been introduced into the body, immediate sampling and short-cut, less sensitive detection methods can be used to obtain results within a few hours. Electronic alpha counting after chemical separation of the plutonium is generally adequate.

- 918 The Measurement of Intensity of Odor. R. G. H. Prince and J. H. Ince. *J. Appl. Chem.* 8, 314-321 (May 1958).

An instrument for the estimation of intensity of odor is described. The dilution required to make the odor just detectable in a mixture with odor-free air is taken as a measure of the intensity, and the instrument is essentially a mechanical device for making the requisite dilution conveniently. Different persons show markedly different sensitivities to a given odor, and these differences vary widely with different odors. These differences in sensitivity cannot then be estimated from the results obtained with a particular "reference" odor, but must be established from long-term averages for the material concerned. Day-to-day variations in personal sensitivity and other errors were small compared with the residual error. Different persons exhibited widely different degrees of reliability in their results, and hence careful selection and training of those using these instruments is important.

-- Editor's summary

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PREVENTIVE ENGINEERING

- 919 Industrial Ventilation: How Is It Designed? J. H. Clarke.
Heat. Pip. Air Cond. 30, 104-109 (June 1958)

Natural ventilation is still used in many industrial areas and, when properly applied, will provide good building ventilation. Convection ventilation is best applied to areas in high shed type buildings in which hot equipment operations provide the convection force for air movement. It is not suitable for the modern, wide, low type of building. Wind force ventilation has few applications in industry. An increasing number of buildings require mechanical ventilation of either the exhaust type or air supply type, or both. Their relative value and applications are discussed. In general, the mechanical supply-exhaust combination is most effective. Three methods of providing supplementary summer ventilation are described.

- 920 Engineering Design Factors in Dust and Fume Recovery Systems. R. O'Mara and C. R. Flodin. J. Air Poll. Control Assn. 8, 39-44 (May 1958).

The authors discuss fume and dust recovery systems in which the gases are vented to the atmosphere and not used. A number of major factors to be considered in the engineering design of such systems are considered. Research is often needed to determine the operating system. The work involves: (1) review of available plant information and data; (2) tests and laboratory analyses to obtain dust and fume quantity and character; (3) pilot plant work if indicated; and (4) calculations to establish the collection requirements. Factors affecting collection equipment selection are tabulated. A check list of collector applications is charted, and flow sheets are given for various applications. Many suggestions are presented for particular processes.

- 921 Dust Emission Control Program at Electromet. S. S. Blackmore.
Ind. Wastes 3, 73-78 (May-June 1958).

By their very nature, ferro-alloy and calcium carbide plants present problems in air pollution. Experimental studies showed that scrubbers would remove more than 98% of the dust resulting from calcining lime in rotary kilns. Other elements in the program of air pollution at "Electromet" (Division of Union Carbide Corporation) included: replacement of open top calcium carbide producing furnaces with new gas collecting systems; design and installation of new dust-free coke drying systems; replacement of steam locomotives with diesels; addition of bag-type dust collectors to the newly installed dry cyclone dust collectors; and a separate fluid waste control system that returns clean water to the supply system.

-- Editor's summary

- 922 Further Investigations of the Continuous Slag Wool Filter. C. E. Billings, L. H. Levenbaum, C. Kurker, Jr., E. C. Hickey, and L. Silverman.
J. Air Poll. Control Assn. 8, 53-64 (May 1958).

Field tests of the second continuous slag wool pilot plant operated normally on open hearth fume indicated an average collection efficiency of 50%, ranging from 0 to 89%. (For a report on the first pilot plant see IHD Abst. 151, Jan. 1956). Efficiency is increased somewhat by a rotary screw agglomerator preceding the unit. Minor redesign of the unit to provide a positive seal and sequential indexing should give uniform collection efficiencies greater than 90%. Stationary slag wool filters gave an average efficiency of 90%, with an average resistance of 6.5 in. of water. Resistance of the normally operated continuous filter was controlled by varying rotation speed and was usually maintained at 4 in. of water without difficulty. Use of the screw

agglomerator decreased the rate of resistance for stationary filters by 30%, and should extend fiber usage by 30%. About 4 tons of slag wool per day would be required for the average 250-ton open hearth furnace. Average dust loading to the filter was about 0.1 grain per cu. ft. as in the earlier tests. Mechanical operation of the unit and accessories was generally good. Minor modifications in design have been suggested by field experience.

-- Cond. from authors' conclusions

- 923 Smoke and Soot Problem at Scrap Metal Refinery. L. Bykowski.
Ind. Wastes 3, 38-41 (Mar.-Apr. 1958).

One of the problems common to all scrap metal refining plants is that of keeping smoke and soot from becoming a nuisance in their neighborhoods. The problem becomes especially acute when the scrap is saturated by oils and greases. The problem was solved by the author's firm by installation of a hydro-precipitator scrubber specially designed to clean the exhaust gases. It consists essentially of a rectangular housing containing a plenum, a multiple-tube section, two water tanks built underneath the housing, a dewatering filter, and an exhaust fan mounted on top of the housing. It is capable of scrubbing gases discharged at more than 20,000 cfm. The scrubber and its operation are described, with illustrations.

- 924 The Collection of Silica Fume with an Electrostatic Precipitator. J. E. Yocom and S. Chapman. J. Air Poll. Control Assn. 8, 45, 48-52 (May 1958).

The collection of silica fume at efficiencies over 90% has been found to be feasible in either a dry- or wet-collection type electrostatic precipitator. Preliminary results with steam-conditioned fume indicated a marked improvement in precipitator electrical operation over that encountered with dry fume. A cost estimate for a commercial size silica-fume precipitator indicates an investment cost of \$2.63 per cfm of furnace gases treated.

-- Authors' conclusions

- 925 The Effectiveness of Sand as a Filter Medium. R. E. Yoder and F. M. Empson.
Am. Ind. Hyg. Assn. J. 19, 107-110 (Apr. 1958).

It has been demonstrated that an aerosol size for maximum penetration exists for many filter materials. It is possible now to design a filter made of the medium for which the penetration characteristics are known and secure any degree of protection desired for all aerosols. The experiments described show that, with proper design, sand may be used to filter aerosols from either dry or moist gas streams. Radioactive ruthenium and iodine have been successfully removed from the vapor stream arising from a boiling mixture containing each of these isotopes. With the addition of small beds of soda lime and active carbon, oxides of nitrogen can also be removed from the gas stream.

- 926 Is Spray Coating Being Done Safely in Your Plant? S. Marlow.
Monthly Rev., N. Y. State Dept. Labor 36, 39, 40 (Oct. 1957).

To spray coat in a safe manner, the following must be considered: (1) location of the operation; (2) control of flammable and toxic air contaminants produced by the operation; (3) selection and installation of proper ventilation and electrical equipment; (4) manner in which the spray coating operation is performed; (5) maintenance, cleaning, and repair of the installation; and (6) storage and handling of flammable and toxic spray coat materials. The first three factors must be considered in the design of the system. Proper storage facilities must also be considered. A check list is given by which safety factors in operation, maintenance, storage, and handling may be evaluated.

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- 927 Removal of Oxides of Nitrogen from Exhaust Gases for Health Reasons. M. E. Pozin and G. V. Bel'chenko. Trudy Leningrad. Tekhnol. Inst. im. Lensoveta. No. 36, 133-138 (1956). Russian.

The difficulty in removing nitrogenous gases is that, while nitrogen dioxide and trioxide can be absorbed by several substances, attempts to use solid adsorbents such as silica gel and activated carbon for nitric oxide have been unsuccessful because of the

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difficulty of oxidizing nitric oxide, which occurs in small concentrations. Results were obtained by simultaneous oxidation of nitric oxide, nitrogen dioxide, and nitrogen trioxide and absorption of the latter two in an alkaline absorbent with oxidizing properties (an aqueous suspension of bleaching powder or a mixture of it with lime). It was established by experiments that these suspensions will extract oxides of nitrogen from the waste gases from sulfuric acid works. Extraction of nitric oxide in the absence of nitrogen dioxide is 50-55%. The total removal of nitrogenous gases containing nitric oxide and nitrogen dioxide will be 75-80% or more, and this will reduce the concentration of oxides of nitrogen in the waste gases from 0.2 to 0.05%.

-- Atm. Poll. Bull.

COMMUNITY AIR HYGIENE

- 928 The Air over Louisville. Summary of a Joint Report by the Special Air Pollution Study of Louisville and Jefferson County, Kentucky, 1956-1957. 57 pp. (1958). Obtainable from Chief, State and Community Service Section, Robert A. Taft Engineering Center, 4676 Columbia Parkway, Cincinnati 26, Ohio.

This publication is a summary of a more detailed Technical Report to be published in the near future, but it presents much information about the Louisville survey, in non-technical language. The report is the result of the cooperation of several local, state, and Federal agencies. The survey included: (1) an inventory of the sources of pollution; (2) an air sampling program; (3) a meteorological study; (4) an odor and human response survey; (5) a study of material deterioration; and (6) a study of airborne bacteria. Procedures used in the various studies are described. The results showed that over 26 million pounds of pollutants are produced monthly in the West End and in Rubbertown, a suburb adjoining the city, both of which are highly industrialized. About 90% of these pollutants are gaseous and 10% solids. Industry contributes 85% of the emissions, domestic heating 9%, and transportation 6%. More than 88% of the pollutant gases come from the combustion of fuels; oxides of sulfur and of nitrogen constitute about half of the amount of these gases. In the meteorological studies, calcium and chlorine given off from the stacks, served as natural tracers. A number of organic pollutants were determined and correlated when possible with the odor studies. Several sources at a distance from the city contribute to the air pollution problem. A number of recommendations are presented for reduction of various types of pollutants by legal and cooperative means. Information and education of the public is stressed.

- 929 Appraisal of Air Pollution in Tennessee. Report of a Cooperative Survey by the U. S. Public Health Service and the Tennessee Department of Public Health, December 1956- July 1957. P. A. Kenline. 85 pp. (Sept. 1957). Obtainable from Chief, State and Community Services Section, Community Air Pollution Program, Public Health Service, Robert A. Taft Engineering Center, 4676 Columbia Parkway, Cincinnati 26, Ohio.

A survey of factors relative to air pollution in Tennessee has been made by interpretation of existing information and by interviews and questionnaires. Sources of air pollution include: combustion of soft coal; combustion of fuel oil, gasoline, and diesel fuel; industrial emission of pollutants; and refuse burning in open dumps. Geographical features are discussed. Seven cities in the state have air pollution or smoke control ordinances. It is concluded: that air pollution problems exist in many portions of the state; that these problems arise from many sources and cause nuisance conditions, damage to property, economic loss, and injury to vegetable and animal life; that these problems cannot be handled effectively by existing local activities in most instances; and that there is need for additional activity in the air pollution field at both state and local levels. The local governments, with reason, look to the state for technical assistance and guidance in meeting their complex air pollution problems.

-- Cond. from author's summary

- 930 Dust Retention Efficiencies of Dustfall Collectors. J. S. Nader.
J. Air Poll. Control Assn. 8, 35-38 (June 1958).

Dustfall collectors representing three collection techniques (dry collectors with and without baffles and unbaffled wet collectors) were exposed to weather conditions typical of a temperate climate. A statistical evaluation of the gravimetric analysis data and the dust retention efficiencies shows no significant differences among the three types of collections. -- Author's conclusions

- 931 The Natural History of Chronic Bronchitis. D. D. Reid and A. S. Fairbairn.
Lancet 1, 1147-1152 (May 31, 1958).

The sickness-absence records of postmen in various parts of Great Britain, which were available for their entire period of service, were studied for information on chronic bronchitis, including possible relation to air pollution. The postmen were divided into two groups: (1) men ultimately disabled or dead from chronic bronchitis, and (2) those not so affected. The first group had more absences than the second group, even in early adult life. The difference was caused to a large extent by attacks of bronchitis and other respiratory diseases. The difference became much greater after the age of 45. The bronchitics had 8 to 10 times as many attacks of pneumonia, pleurisy, and asthma, and more circulatory disorders, peptic ulcers, coronary disease, and lung cancer, than the control group. Bronchitic postmen who had worked in the more fog-ridden parts of the United Kingdom had, after the age of 65, far more absences from bronchitis, pleurisy, pneumonia, and circulatory disorders than bronchitic postmen from less polluted areas. The onset of bronchitic attacks was more closely related to fog frequency than to cold or humidity, and there were clear gradients between the less and more polluted areas in the short-term and long-term prognosis of the disease. No data on smoking habits were available to confirm or deny its role in the natural history of chronic bronchitis.

-- Cond. from authors' summary

- 932 Damage to Vegetation from Polluted Atmospheres. J. T. Middleton, E. F. Darley, and R. E. Brewer. J. Air Poll. Control Assn. 8, 9-15 (June 1958).

The effects of particulates, sulfur dioxide, fluorine, oxidants, ethylene, and miscellaneous compounds are discussed. Plant species vary greatly in resistance to damage by various chemicals. One point noted is that smog of the Los Angeles type and sulfur dioxide tend to counteract each other in effects on vegetation, but not under all conditions. This property can be utilized in detecting mixtures of air pollutants.

- 933 Air Pollution and its Control. Excerpts from Engineers Joint Council Policy Statement on Air Pollution and its Control. Coal Utilization 12, 20-23 (May 1958).

Control of industrial and domestic pollution may be attempted in one or some combination of three ways: (1) by dilution; (2) by abolition; or (3) by treatment. Control by dilution is an age-old method. It has many advantages and much capacity for disposing of contaminants effectively. It fails miserably, however, when its limitations are not strictly respected. Another method of air pollution control is abolition of the sources of trouble. No doubt this is the perfect solution, but unfortunately, its application is often restricted because of cost or impracticability. The third method of air pollution control is by treatment of the wastes to reduce their potency and other unfavorable characteristics before they are discharged into the atmosphere. This approach is an adjunct to the dilution method. Many corrective methods are now available for treating air pollutants. Some of the more common ones are: (1) superior combustion chambers; (2) scrubbing facilities; (3) settling chambers; (4) filters; (5) mechanical separators; (6) electrostatic precipitators; and (7) counteractants. Where applicable, each of these devices has provided a significant contribution to air pollution reduction.

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- 934 Fly-Ash Emission Limits and Standard Test Methods for Municipal Incinerators. B. J. Geisheker. Public Works 88, 151, 152 (Sept. 1957).

As a great many cities have turned to incineration as an economical means of disposing of combustible waste materials, the need for installations that could be located in residential areas without nuisance from noise, odors, smoke, or fly ash has been manifested. Such installations have to be properly tested with reference to capacity and nuisance-free performance. Development of a new set of test procedures and limitation criteria for municipal incinerators, or at least careful review and revision of presently used testing and control measures will require much study and investigation. The author invites representatives of municipal organizations to join the crusade for up-to-date air pollution test procedures for proper and impartial rating of municipal incinerators.

-- Cond. from Public Health Eng. Absts.

- 935 Fly Ash Collection and Use. H. H. Russell. Coal Utilization 12, 25-27 (May 1958).

Practical solutions to the fly ash problem have in the past years concerned marketing efforts in established outlets and development of new possibilities. These efforts have produced significant results as evidenced by the data on the tonnages of fly ash marketed in various areas. Present outlets are limited in size and seasonal in character. There is considerable market expansion potential in these existing fields, but the facts show that even a manyfold increase in existing outlets would not solve the problem of finding markets for all the fly ash produced. The problem of economics is very critical. At the present time fly ash research is being carried on by three major universities. Five other universities are engaged in research involving the existing outlets for fly ash. A comprehensive and continued research effort is required if new larger markets are to be developed. Many more new markets are needed and they must serve to sustain demand at a high level the year round. There appears to be no easy or inexpensive answer.

- 936 The Formation of Aerosols by Irradiation of Dilute Auto Exhaust. G. J. Doyle and N. A. Renzetti. J. Air Poll. Control Assn. 8, 23-32 (June 1958).

Aerosol can be formed by irradiation of dilute auto exhaust. Within the range of concentrations studied aerosol formation is favored by increasing the concentration of deceleration exhaust, and, to a lesser degree, by increasing the concentration of oxides of nitrogen. The aerosol so formed is in the submicron size region, but is of sufficient concentration and size to reduce visibility appreciably and to increase the mass concentration of the aerosol. No connection between aerosols and eye irritation can be proved from the present data.

-- Authors' conclusion

- 937 Automotive Exhaust Hydrocarbon Reduction During Deceleration by Induction System Devices. H. H. Dietrich and others. Paper 170, S.A.E. Journal 65, 72-77 (Oct. 1957).

The principle of the vacuum-limiting type of device appears to be more suitable for universal application than other approaches to controlling hydrocarbon emissions during motor vehicle deceleration. Other devices tested include: a slow throttle return dashpot; several types of idle fuel shut-off devices; a device for interrupting ignition during deceleration; and a number of miscellaneous devices. The vacuum-control throttle opener has the following advantages: (1) good reduction in hydrocarbon emission under all conditions; (2) easy installation either in production or in the field; (3) reasonable cost; and (4) accurate control of unburned hydrocarbons. On the other hand, brake wear in traffic driving is increased. Fuel economy is affected to a negligible extent.

- 938 The Air Pollution Disaster-Prevention Program of Los Angeles County. R. L. Chass, M. Pratch, and A. A. Atkisson. J. Air Poll. Control Assn. 8, 72-86 (May 1958).

The program designed to prevent disastrous smog concentrations in Los Angeles County is described in detail. Its essential features are: an air monitoring system by which carbon monoxide, nitrogen oxides, ozone, and sulfur dioxide are determined continuously at 14 stations, and a system of three alerts when any of these reach definite

concentrations, the third of which constitutes a dangerous health menace. Action on each of these alert stages and voluntary and enforcement provisions are described. From July 1955 to May 1957 ozone concentrations reached the first alert stage 25 times, but never the second stage. Several problems that have arisen in the course of the program are discussed. They are concerned with: (1) timing of the alerts before a danger is present; (2) lack of knowledge of the toxicity of contaminants in the general atmosphere; (3) lack of correlation between smog and concentration of any of the contaminants tested; and (4) difficulty in making plans for halting vehicular traffic. It is hoped that continued technical advances will solve these problems.

- 939 The Evolution and Nature of the New York State Air Pollution Control Law. R. W. Hess. Ind. Wastes 3, 35-37 (Mar.-Apr. 1958).

In the evolution of the present Air Pollution Control Law, about 20 bills were introduced in the legislature but were judged inadequate. The present law was the outcome of many committee conferences and tentative programs which were fully discussed by all those interested, and was finally passed unanimously in 1957. Although provisions are included for broad orders and court action as last resorts, most of the provisions of the law formulate an integrated program for developing and protecting all interests of the state on the basis of scientific knowledge in conformity with the declaration of policy. Controls apply to all sources of air pollution, most of which are listed, and may vary in rigidity in different areas, according to topography, meteorology, and duration of atmospheric conditions, as developed through programs of research, surveys, and education. Provisions of the law relating to administration, standards, acceptance of air cleaning devices, inspection hearings, and variances are described. No provision is made for county or regional boards or commissions, but the board has authority to establish areas and prescribe the degree of air pollution permitted in such areas. Enforcement of codes, rules, and regulations will not take effect until July 1, 1959.

- 940 Deep Sea Disposal of Industrial Wastes. D. W. Hood, Bernadette Stevenson, and Lela M. Jeffrey. Ind. Eng. Chem. 50, 885-888 (June 1958).

The chief advantages of deep sea disposal for difficult-to-handle chlorinated wastes is their removal into an environment beyond that which influences man. However, the effect of these wastes on the ocean is vitally important. Sensitive methods for determining the metabolic effects of the waste on phytoplankton indicate that levels below 1×10^{-5} gram (10 micrograms) per liter are not harmful. If disposal is carried out under good operating conditions, subeffective waste levels occur in 8 to 10 hours. With proper precautions, deep sea disposal is useful not only for difficult wastes but also when cost and effectiveness are considered for routine materials as well. --IEC Brief

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MANAGEMENT ASPECTS

- 941 Significance of the 1956 Social Security Amendments to the Insurance Business. J. H. Miller. A.M.A. Arch. Ind. Health 17, 587-589 (June 1958).

The lowering of the age of entitlement of women to social security benefits to 62 years introduces some employment and retirement problems. Of much more significance is the introduction of cash disability benefits into the social security system. The definition of disability in the Social Security act differs from those commonly used in insurance policies which have been judicially interpreted in many cases. The real significance of the words used will not be known until they are interpreted and adjudicated and the benefits are administered in practice. Lack of limitation on the duration of benefits

lowers the incentive to return to work. On the other hand, it is fortunate that the law provides a connection between administration of disability benefits and the rehabilitation program. An important question is what percentage of the individual worker's output he is willing to have diverted through the channels of taxation to support those who are currently not working.

- 942 The Reconciliation of Pensions and Social Security Disability Insurance. R. E. Royes. A.M.A. Arch. Ind. Health 17, 590, 591 (June 1958).

Social Security disability benefits and industrial disability pensions have much in common but also some important differences. The existence of the two systems side by side will raise some knotty problems for companies and for the doctors who advise the companies and the persons concerned. Perhaps a basic understanding of similarities and differences of the two systems will help in resolving these problems during the next few months, when a beginning must be made. -- Author's summary

- 943 Religious Activities in Industry. Occupational Health Asset? J. S. Felton. Ind. Med. & Surg. 27, 259-277 (June 1958).

The introduction of religious activities in the form of devotional services, creation of chapels, and addition of industrial chaplains, has represented a movement of greater strength in the South where a more solid Protestant plant population is found. The continuation or growth of this movement can not be predicted at present in view of the surges and declines in the numbers and appreciation of these undertakings. Opinion is moot among industrialists, the clergy, and personnel directors as to the worth of such activities, and suspicion is high among observers as to the actual reason for perpetuating religious programs at work, i. e., the profit motive and the church attendance motive being the true *raison d'être* for the activity, rather than promulgation of the Christian ethic. Industrial medicine must undertake self-inquiry to determine why functions logically belonging, in great part, to that specialty, have been subsumed by a professional group normally extramural to the industrial installation. It is recommended that properly designed research be undertaken in those plants where religious programs are current to establish their worth if such exists. Physicians in industry should increase their communication with employers, present or prospective employees, and unions in order to familiarize them with services enlightened medicine can offer a progressive management and interested plant personnel. -- Cond. from author's conclusions

ACCIDENTS AND PREVENTION

- 944 The Prevention of "Lighting Off" Explosions. J. B. Smith. Iron Steel Engr. 35, 144, 147, 148 (May 1958).

A recent study of 83 fuel explosions at heat-treat furnaces showed that 40 occurred during lighting-off. At least 25 of these were caused by one or more burner cocks being accidentally left open when the main gas valve was turned on. A cock safety control system by which such occurrences can be prevented is described and illustrated. Application to a combustion blower involves some special features. Directions are given for testing the system. A recent development is the electric FM cock, which is described briefly.

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- 945 Explosiveness of Mixtures of Ammonium Nitrate with Powdered Limestone. S. Pawlikowski, A. Chomiakow, I. Pollo, and M. Okon. *Przemysl Chem.* 13, 697-699 (1957). Polish with English summary.

A fertilizer composed of a mixture of ammonium nitrate and powdered limestone and containing up to 25% nitrogen is fairly safe in transporting and storing. The particles of powdered limestone in the mixture were smaller than 0.75 mm. Ammonium nitrate particles were 0.50-0.75, 0.20-0.50, or below 0.20 mm. The smaller the particle size of ammonium nitrate, and the lower the content of limestone, the more violent was the explosion. The strength of explosions was measured by the Kast ram and Cybulski pendulum methods. All mixtures were either mechanically prepared or melted together.

-- Chem. Absts.

- 946 Spontaneous Decomposition of Trichloroethylene. G. F. Yost. U. S. Atomic Energy Comm. HW-39945, 8 pp. (1957). Obtainable from Office of Technical Services, Washington 25, D. C. 50 cents.

Additional studies on the stability of trichloroethylene were made to supplement a previous report. Results show that trichloroethylene stabilized with either neutral or alkaline stabilizers can be used safely in degreasing operations, even when the system contains trace amounts of acid. However, tests for measuring degree of decomposition and acid build-up are necessary to insure safe operating conditions. The control tests, which are satisfactory for the metal cleaning processes, are based on the chloride concentration and pH. A control limit of 200 ppm maximum chloride concentration and a minimum pH value of 4.0 were established. These limits were established to give adequate control against decomposition and to prevent excessive corrosion.

-- Author's summary (Nuclear Sci. Absts.)

MISCELLANEOUS

- 947 Fluoridation of Water Supplies and Its Relation to Musculoskeletal Disease. C. L. Steinberg, D. E. Gardner, F. A. Smith, and H. C. Hodge. *New Eng. J. Med.* 258, 322-325 (Feb. 13, 1958).

The fluoride concentration in ppm of ash was estimated in 18 various bone samples from 14 patients with different forms of arthritis and from one patient who did not have arthritis, all of whom had ingested fluoridated water for a period ranging from three years and five months to four years and seven months. No excessively high concentration of fluoride was found in any of these specimens. The fluoride concentration in a similar group of bone samples from patients in a non-fluoridated area was also determined. The fluoride concentration values in the two groups were not statistically different. A careful review of the radiograms of both these groups, along with the bone fluoride studies, fails to reveal any relation between various forms of arthritis and the ingestion of fluoridated water as recommended by the health authorities.

-- Cond. from authors' summary

- 948 Disseminated Coccidioidomycosis Apparently Cured with Amphotericin B. Margaret S. Klapper, D. T. Smith, and N. F. Conant. *J. Am. Med. Assn.* 167, 463-466 (May 24, 1958).

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The treatment of disseminated coccidioidomycosis has previously been unsatisfactory. Although a variety of therapeutic agents have been recommended from time to time, none have had any permanent beneficial effect. Antifungal antibiotics have been employed in recent years. Recently two new antifungal antibiotics, the amphotericins A and B, have been described. They were first isolated from soil samples from the Orinoco River region

of Venezuela by the action of a streptomycete. Both forms have antifungal activity when administered parenterally or orally. This report presents the experience of the authors with the use of amphotericin B in a patient with disseminated musculoskeletal coccidioidomycosis of ten years' duration. Apparent cure was effected, after treatment with this antibiotic. The drug was well tolerated with no untoward effects over a 14-month period. The lesions healed within three months and were well healed one year later.

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