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Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL --- decisions and trends

JUNE, 1957
(Vol. 21, No. 6)

INDUSTRIAL HYGIENE FOUNDATION
MELLON INSTITUTE
4400 FIFTH AVENUE -:- PITTSBURGH 13, PA.

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FOUNDATION FACTS

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

Volume 19 | June, 1957 | No. 6

I-H-F STAFF MEMBERS PARTICIPATE IN MEDICAL MEETING

Participating in the 23rd Annual Meeting of the American College of Chest Physicians held in New York from May 29 to June 2 were two members of the Foundation's staff. Dr. Paul Gross presented a paper on "The Topographic Distribution of Mineral Dust in Pneumoconiotic Lungs." Dr. Daniel C. Braun participated in a round table discussion on "Occupational Diseases of the Lungs."

Dr. Braun also attended a meeting of the Committee on Cardiovascular Disease of the Section on Rehabilitation and a meeting of the Joint Meeting of all Councils, Committees and Sections of the College while attending the meeting.

NEW REPRINT AVAILABLE

Reprints may be obtained upon request of a paper on "Health Maintenance in the Petroleum Industry" by Dr. C. Richard Walmer, presented at the 36th Annual Meeting of the American Petroleum Institute, November 12-16, 1956, and published in the A. M. A. Archives of Industrial Health, April 1957, Vol. 15, pp. 331-339.

CONFERENCE HELD BY I-H-F FOR SAND-PROCESSING COMPANIES

A three-day conference devoted to specific aspects of industrial health in the sand-processing industry is being conducted by Industrial Hygiene Foundation for members of the National Industrial Sand Association. Some 30 representatives from these companies are registered for the program, which is being offered for the third successive year at the request of the NISA. It takes place at the Foundation's headquarters at Mellon Institute from June 17 to 19. The first two days will be devoted to discussions of problems relating to the control of dust exposures in the processing and handling of sand and pulverized silica and to related medical aspects. Included will be a discussion of the design of dust control systems. Specific questions submitted by member companies of NISA in advance are also to be taken up at these sessions. The experiences of companies within the group in gaining a high level of dust control will be discussed by members of those organizations with the thought that many of the measures taken might have immediate application in some of the other plants. A discussion on respirators is scheduled for the third day, followed by a review of the program to that point. Through such a program the participating companies have an opportunity to find the best known solutions to their problems with respect to the important health hazard associated with the industry.

PLAN NOW FOR 22ND ANNUAL MEETING OF INDUSTRIAL HYGIENE FOUNDATION

October 30 and 31, 1957, are the dates for the 22nd Annual Meeting of Industrial Hygiene Foundation. If you have not already marked those dates on your calendar, take a moment to do so now. An outstanding program is being arranged for the technical and management conferences. Announcements of the topics and speakers will be made next month.

I-H-F

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Industrial Hygiene Features

An index of toxic chemical substances found in consumer products; their manufacturers; and diagnosis, laboratory procedures, and treatment of chemical poisoning. Abstract No. 713.

What physicians in the United States have written on occupational health topics—a listing of 100 books. Abstract No. 717.

What are the physiological effects of ozone? Abstract No. 728.

A review of the hygienic aspects of aluminum in the environment. Abstract No. 731.

Alkylaluminum compounds extremely hazardous because of their reactivity—suggestions for safe handling of the compounds and for treatment of burns is given. Abstract No. 732.

Experiments show sodium diethyldithiocarbamate to be effective in the treatment of nickel poisoning. Abstract No. 733.

A general description of the properties of organic peroxy-compounds and their industrial applications and hazards. Abstract No. 743.

Radiological survey shows quarry workers to be less susceptible to pneumoconiosis but more so to tuberculosis than coal miners. Abstract No. 752.

Discussion of the audiometer and its use in industry. Abstract Nos. 766 and 767.

An automatic testing device for testing hearing of large numbers of workers without skilled personnel. Abstract No. 769.

Mobile laboratory proves to be a useful facility for making hearing measurements in the field. Abstract No. 770.

A unique application of radiation safety principles. Abstract No. 790.

The safety and accident record to date in routine operations of AEC contractors. Abstract No. 791.

A program for meeting the situation of problem drinking in industry. Abstract No. 806.

Minimizing the accident risk in stressful man-machine situations involves a revision in the design of the work situation based upon a fundamental understanding of biomechanics. Abstract No. 808.

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Industrial Hygiene Foundation
4400 Fifth Avenue
Pittsburgh 13, Pennsylvania

INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

702 Mellon Institute to Erect Chemical Hygiene Building.

A spacious building for the Chemical Hygiene Fellowship research group will be erected in the near future. This Fellowship is sponsored by Union Carbide Chemicals Company for the purpose of investigation of possible hazards of chemicals under development by that organization and has been under the direction of Dr. Henry F. Smyth, Jr., since 1937. Although most of the research is concerned with chemical products, the Fellowship has met increasing responsibilities for products of the Silicones, Plastics, Metals, Linde, and Nuclear Divisions. The building will contain 30,000 square feet, a substantial increase over the present space occupied by the Fellowship. It will be located about 20 miles east of Pittsburgh, near Mellon Institute's Bushy Run Laboratories, now under construction, which will house the Institute's recently established Department of Radiation Research. It is expected that the Chemical Hygiene building will be ready for occupancy by March, 1959.

703 Public Health Agency for Industrial Chemicals.

A technical information service to help industry protect its workers from the health hazards arising from the great number of new chemicals introduced each year is being set up by the U. S. Public Health Service. Named the Occupational Health Information Exchange, the agency will bring together a vast fund of unpublished information from scattered sources. An estimated 1,000 to 10,000 new compounds are developed every year by industry, and this organization will fill the need of one central agency to supply information on their toxicity as well as the toxicity of older compounds and processes.

704 Course in Audiology for Industry.

Colby College, Waterville, Maine, presents the Fifth Annual Course in Industrial Deafness, August 5-10, inclusive. The objective of the course will be to train personnel in initiating and conducting hearing conservation courses in noisy industries. Eight full-time instructors have been selected from authorities in this field. The class is limited to approximately 20 participants. Registrants will live on the campus, and the tuition of $200 includes board and room. Applications should be made to Mr. William A. Macomber, Director, Division of Adult Education and Extension, Colby College, Waterville, Maine.

-- Arch. Ind. Health

705 Reporting Accidents with Radioactive Materials.

Accidents with radioactive materials must be reported to AEC immediately under a new set of rules just put into effect. The new rules will let AEC make sure that the licensee is taking immediate action to hold down damage from the accident and determine its cause. A recent accident at South Houston, Texas, probably led to the new rule.

-- Chem. & Eng. News

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COMING EVENTS

706	July 1-6	Twelfth International Conference on Occupational Health, Helsinki, Finland. (See news item in January Digest)
	July 8-12	Fourth International Poliomyelitis Conference, Geneva, Switzerland.
	July 17-20	Thirty-eighth Southern Industrial Relations Conference, Blue Ridge, N. Car.
	Aug. 5-10	Course in Audiology for Industry, Colby College, Waterville, Me. (See news item)
	Aug. 7-9	Sixth Annual Conference on Industrial Applications of X-Ray Analysis, Denver, Colo.
	Aug. 12-23	Courses in Noise Reduction, M.I.T., Cambridge, Mass. See news item in May Digest)
	Aug. 25-29	American Institute of Biological Sciences, Stanford, Calif.
	Sept. 8-12	American Chemical Society, 132nd National Meeting, New York, N Y.
	Sept. 9-13	Instrument Society of America, 12th Annual Instrument Automation Congress, Cleveland, O.
	Sept. 16-Nov. 8	Course in Occupational Health, Institute of Industrial Medicine, New York University. (See news item in April Digest)
	Sept. 23-24	Steel Founders' Society of America, Fall Meeting, Hot Springs, Va.
	Sept. 23-25	American Society of Mechanical Engineers, Fall Meeting, Hartford, Conn.

OCCUPATIONAL DISEASE STATISTICS

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

	Colo. Mar. 1957	Conn. Apr. 1957	Ind. Apr. 1957	Mo. Apr. 1957	Tenn. Feb.-Apr. 1957	Total
Acid tremor					1	1
Brucellosis	1					1
Carbon monoxide	1				5	6
Chemical burns and abrasion					1	1
Dermatitis	26	62*	5*	22*	27*	142
Eye irritation					1	1
Lead	2	1			6	9
Lung irritation, acid fumes					1	1
Silicone fumes inhaled					1	1
Silicosis	6				1	7
Silico-tuberculosis		1				1
Solvents	3					3
Sulfate poisoning				1		1
Toxic hepatitis (chemicals NOC)		1				1
Urticaria, entire body					1	1
Miscellaneous and unknown	5				3	8
Total	44	65	5	23	48	185

* Causes are listed in the following reports:

Connecticut: oils, fats, and waxes, 17; solvents NOC, 13; synthetic resins and chemicals, 5; dust, inorganic 3, infections, 3; dust, metals and compounds 2; chloronaphthalene and chlorodiphenyl, 2; abnormalities of temperature, acids, alkalies, chemicals NOC, chlorinated hydrocarbons, plating solutions NOC, and soap solutions, glue, etc., 1 each; and undetermined, 10.
Indiana: solvents 2; dust treatment of coal, resin, and cutting oil, 1 each.
Missouri: poison oak, 1; not specified, 21.
Tennessee: infections, 2; sizing, 1; chemicals, 1; and not specified, 21.

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LEGAL DEVELOPMENTS

708 New Legislation.

Maximum compensation benefits for total disability have been increased in Maryland. In Minnesota, maximum compensation benefits for death and total and partial disability and the maximum period for temporary total disability and for temporary and permanent partial disability have been increased. Oklahoma has increased the maximum weekly compensation for permanent total disability and for temporary total and partial disability. Death and total and partial disability benefits have been increased in Washington, with a number of specifications regarding benefits to dependents and survivors. In Vermont the time for which hospital services and supplies must be provided for a party disabled from an occupational disease has been increased from 60 days to 3 years, and the total allowance for such hospital services and supplies has been increased.

-- Cond. from Commerce Clearing House Reports

709 Pulmonary Tuberculosis—Statute of Limitations—Effect of Subsequent Legislative Amendment.

Plaintiff's right of action for pulmonary tuberculosis, disability from which commenced on December 16, 1952, expired under the applicable one-year statute of limitations on December 16, 1953, so that the action commenced for compensation on July 26, 1954, was deemed to be barred and dismissed. An amendment to the statute effective March 9, 1955, while plaintiff's suit was pending, which created a two-year limitation period did not have the effect of reviving plaintiff's barred right of action. The Occupational Diseases Act, like the Workmen's Compensation Act, creates contractual rights between employer and employee when accepted by them and plaintiff's statutory contract with his employer at the time he suffered his disablement was that he, plaintiff, had one year from the date of his disablement within which to file his claim. The contractual time for the filing of the claim is attached to the right to recover. The employer's liability could not be renewed by the later statute. Award dismissing plaintiff's application is affirmed. Oberg v. D. O. McComb & Sons. Indiana Appellate Court. No. 18,836. March 22, 1957.

-- CCH

710 Death from Silicosis—Voluntary Lifetime Payments by Employer—Credit Against Death Benefit.

The employer is not entitled to credit against the award of death benefits to a widow for the death of her husband resulting from silicosis for certain sick benefits and voluntary payments made (1) to decedent prior to the complete inability of decedent to work or (2) to decedent out of an employee's benefit association which was not liable for compensation to the employee, even though these payments were made after decedent became totally disabled to work. With respect to voluntary payments made by the employer to decedent after total disability (no claim having been made by decedent for compensation during his lifetime), credit is allowable to the extent that the payments covered the employer's liability for the weeks in which compensation was due. This means that the employer is entitled to a credit for the weeks during which the payments were made and not for the amount of the payments ($1.30 per month). Although the award is on the claim of the widow and children of deceased, such payments made by the employer to the deceased in his lifetime must be deducted therefrom. The order of the board refusing credit for any of the payments made by the employer is reversed and the record remanded for modification of the award in accordance herewith. Vanino v. Textile Machine Works. Pennsylvania Superior Court. No. 195. March 20, 1957.

-- CCH

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711 Dupurtren's Contraction—Medical Testimony—Notice—Causal Connection.

Where an employee contracted Dupurtren's contraction was compensable under the applicable statute. The court further held that the evidence presented was sufficient to sustain a finding that the disease was causally related to the employee's work as a truck driver. The court further found that the employee had given timely notice to the employer that he had contracted a compensable disease since the employer was notified by registered mail within the time limit provided for in the statute. It was also held that the quantum of the award is to be measured by determining the extent to which the employee is restricted in the ordinary pursuits of life, which the court found to be 60%. Affirmed. Duncan v. T. I. McCormack Trucking Co. New Jersey Superior Court, Appellate Division No. A-758-54. February 18, 1957. -- CCH

712 Aggravation of Pre-existing Tubercular Condition—Statute Construed.

The court held that where an employee was suffering from tuberculosis, and it was determined that the constant inhalation of dusts and fumes directly contributed to the acceleration or aggravation of a pre-existing tubercular condition, the employee has suffered an injury by "accident" for which he must be compensated by the employer in whose employment the injurious exposure occurred. There was found to be a causal connection between the employee's injury and the exposure to which he was subjected. The court held that the requirement that in order to be compensable, the aggravation of the pre-existing condition must be the result of an "accident" was met here because the fundamentally accidental nature of the injury is not altered by the fact that, instead of a single occurrence, it is the cumulative effect of the inhalation of dust and fumes to which an employee is peculiarly susceptible that accelerates an employee's pre-existing disability. Reversed and remanded. Czepial v. Krohne Roofing Co. Florida Supreme Court. No. 28,088. February 6, 1957. -- CCH

BOOKS, PAMPHLETS AND NOTICES

713 Clinical Toxicology of Commercial Products. Acute Poisoning (Home and Farm). Marion N. Gleason, Robert E. Gosselin, and Harold C. Hodge. Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore 2, Md. 1160 pp. (1957). $16.00.

The purpose of this book is to assist the physician in dealing quickly and effectively with acute chemical poisonings in the home and on the farm, when, through mususe, a patient eats or drinks a harmful amount of a toxic commercial product. The first of the seven sections of the book deals with first aid and general emergency treatment. The second section contains an index of over 1,000 chemical substances found in consumer products, arranged alphabetically, rated, and briefly discussed as to toxicity and cross-indexed to the next section. A therapeutics index provides an extended discussion of the same substances, with diagnosis, laboratory procedures, and treatment. The section on supportive treatment describes the general principles and follow-up of poisoning cases. The longest section lists alphabetically about 15,000 commercial products found in home and farm, with a list of ingredients and toxicity rating of each product. The next section lists general formulations of a large number of products. Finally, addresses are given for over 4,000 manufacturers of products found in home and farm. The scope of the book is formally limited to poisoning in the home and farm, but many of the substances listed are also sources of occupational poisoning, although exposure by inhalation and contact are necessarily excluded. The material is obviously of great interest to manufacturers of toxic products. -- FFR

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714 Voluntary Health Insurance in Two Cities. A Survey of Subscriber-Households. Odin W. Anderson. Harvard University Press, Cambridge 38, Mass. 145 pp. (1957). $5.00.

This book, drawn entirely from new material, gives a serious and objective evaluation of the effectiveness of certain health insurance benefits. Families enrolled in Blue Cross and Blue Shield in Brimingham, Ala., and Boston, Mass., and families belonging to employed groups enrolled under the Aetna plan in Boston, were interviewed with a pre-tested questionnaire. The investigation revealed how much the prevailing pattern of benefits helped families to pay in a year for various types of service. The benefits were quite adequate for hospital care and surgery. It was clearly indicated, however, that the cost of home and office calls, obstetrical services, drugs and medicines, and dental care, which voluntary health insurance does not attempt to cover, can present major problems to some families. A high proportion of the families were satisfied with the coverage. Of those who were not satisfied many were in favor of increased non-hospital benefits, and about two-thirds of these were willing to pay additional premiums for those benefits. A small majority preferred the small-expense type of insurance to major medical insurance or to both. Other details and their implications are discussed. -- FFR

715 Silicones in Medicine and Surgery. R. R. McGregor. Dow Corning Corporation, Midland, Mich. 44 pp. (1957). Obtainable without charge from publisher.

This brochure summarizes the conclusions of various authors with respect to the use of silicones in many branches of medicine and surgery. The value of silicones in the field of medicine is not due to their physiological action, but rather to their physical properties, since they are extremely inert, and to their resistance to enzymes and bacteria. The silicones and their decomposition products have a low order of toxicity. An important use is in dermatology, as constituents of barrier creams, ointments and cosmetics. Other uses discussed are: in instrument sterilization fluids; in dental applications; in coating of vials; in the treatment of cattle bloat; in the coating of tubing for blood handling and internal surgery; in gastroscopy; as carriers for injectables; in treatment of pulmonary edema and of peptic ulcers; and several miscellaneous applications. In some of these applications silicones are of established value; in some there is further work to be done; and in others their use has been suggested but their value has not been proved. The author is careful to distinguish between these categories in dealing with each of the applications discussed. -- FFR

716 Epilepsy. Grand Mal, Petit Mal, Convulsions. Letitia Fairfield. Philosophical Library, Inc., 15 East 40th St., New York 16, N. Y. 159 pp. (1957). $4.75.

The aspects of epilepsy considered are: definition, treatment, the epileptic child, employment, epileptics in the community, colonies for epileptics, and epileptics and the law. In the chapter on employment, a number of facts and fallacies are considered. Any epileptic whose fits are not fully controlled is unsuited for employment involving work with live machinery or vehicles, work where falls are possible, or work in isolated places. Other employment depends on the type of epilepsy, time and severity of seizures, after-effects, degree of mental deterioration if any, and treatment. Each case should be considered on its merits. Clerical work, accountancy, needle trades, tailoring, many kinds of factory work and handicrafts, gardening, horticulture, and domestic service are among the possibilities to be explored. Employment-finding services, epileptic clinics, industrial training, sheltered workshops, and other features of the British program are discussed. -- FFR

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INDUSTRIAL MEDICAL PRACTICE

717 Books on Occupational Health and Their Medical Authors. J. S. Felton. Ind. Med. & Surg. 26, 260-262 (May 1957).

A list of approximately 100 books written by industrial physicians and other physicians in the United States on occupational health topics is presented.

718 The Health of the Worker. P. A. B. Raffle. Brit. J. Ind. Med. 14, 73-80 (Apr. 1957).

The study of the health of the worker is described as a two-way track. The contribution of medicine to industry is exemplified by the use of sickness-absence statistics. The factors influencing sickness-absence rates in occupational groups are discussed and examples are given of the value of these rates in investigating specific health problems. The contribution of industry to medicine is illustrated by the use which is made in medical research of data collected in industry. The value of these data in the investigation of bronchitis, coronary heart disease, and cancer of the lung is discussed. The incidence is given of cancer of the lung in groups of the London Transport staff which have varying exposure to diesel exhaust gases. -- Author's summary

719 Proceedings of Eighth Annual Meeting, American Academy of Occupational Medicine, Feb. 15-17, 1956, Cincinnati, Ohio. 110 pp. (1956).

The first item in the Proceedings is a symposium on The Organ Systems in Relation to Occupational Medicine. The following papers are included: "The Skin," by R. R. Suskind; "The Respiratory System," by V. A. Plessinger; "The Circulatory System," by A. Iglauer; "The Hemopoietic System," by K. V. Kitzmiller; "The Liver and the Gastrointestinal Tract," by S. A. Safdi; "The Genito-Urinary System," by J. W. Hauser; "The Central Nervous System," by J. Campbell; and "Man as a Whole," by W. D. Ross. Each of these papers is a review of the subject in relation to industrial medicine, and discussion by several participants.

Another series of papers deals with the role of various agencies in promoting occupational health, including: "Private and University Laboratories in Occupational Health," by R. A. Kehoe; "The Local Health Agency in Occupational Health," by M. R. Zavon; "State Industrial Hygiene Functions," by T. F. Mancuso; and "The United States Public Health Service in Occupational Health," by W. C. Cooper.

Among the individual papers are: "Diagnosis and Treatment of Back Pain—Evaluation of Ability to Work," by R. Perlman; and "The Economic Aspects of Industrial Medical Programs," by M. S. Blumberg. The latter paper is concerned with a survey of management attitudes toward industrial medicine. The results have not as yet been summarized. Four other papers are abstracted separately.

720 Some Factors Influencing the Response of Industrial Workers to Mass Radiography. G. Z. Brett. Brit. J. Ind. Med. 14, 92-94 (Apr. 1957).

Mass radiography surveys conducted on sites varying in distance from 100 yards to one mile from places of work showed that the siting of the unit did not influence the response of factory workers. The increased attendance in surveys carried out on factory premises is attributed to the cooperation of managements. -- Author's summary

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721 The Common Cold and Stress Conditions. N. Dietz, Jr. Ind. Med. & Surg. 26, 229-233 (May 1957)

A controlled study of the incidence of common colds in a group of 96 medical, pharmacy, and allied students was conducted over a ten-week period, consisting of preliminary and pre-stress periods of four weeks each and a stress period of the two weeks of final examinations. The prophylactic agent given orally to part of the group consisted of 500 mg. of ascorbic acid and one gram of lemon bioflavonoid complex per day. Over the entire period the treated group reported fewer colds and had less nasal discharge and excess sputum, than the placebo group. The contrast was most marked during the stress period. The average duration of colds was also shorter in the treated groups during the pre-stress and stress periods. There were no side-effect symptoms reported from the administration of the ascorbic acid and bioflavonoid. The results tend to support the concept that the prophylaxis described as employed for young adults favorably influenced the common cold incidence and duration during a period of stress.

-- Cond. from author's summary

722 Traumatic Neurosis. D. W. Loria. Ind. Med. & Surg. 26, 253-259 (May 1957). (From Mich. State Bar J., July 1956).

Every time the body suffers an injury, there are concomitant emotional effects. Because these effects frequently exceed the physical damage, and sometimes are the only remaining vestige of the injury, the lawyer is being more and more forced to seek the aid of the psychiatrist and the psychologist. Twenty signs by which the lawyer may recognize neuroses are discussed. Preparation and conduct of a compensation case where neurosis is involved is more difficult than that of an ordinary case. A number of factors are discussed. It must be made clear to the court and the jury that the pain experienced by the neurotic is as real as if the physical basis were present. Through preparation of the case and the selection of an expert psychiatrist or psychologist are necessary. The psychiatrist should be permitted to testify as to his findings and diagnosis with far greater latitude than is permitted the nonpsychiatric witness. Direct examination and cross-examination of the psychiatrist are discussed. A typical case history is presented.

723 Ballistocardiography in Industrial Medicine. Ballistocardiographic Examination of the Circulation in Employment Examinations at Mines. E. Heymanns, F. Kazmeier, W. Schild, and H. J. Voigt. Zentr. Arbeitsmed. Arbeitsschutz 6, 260-266 (Nov. 1956). German.

Ballistocardiography is a simple and expeditious method for determining circulatory function in routine examinations. Published experience in the United States, where the method has been in use for several years, shows that a normal ballistocardiogram is obtained in healthy persons who are fit for work. An adaptation used by the authors is described, and results of examinations of 270 persons are given. It is concluded that the ballistocardiogram taken in the course of examination of the circulation is an important factor in reaching certainty in diagnosis and for deciding on capacity for work even when clinical findings and the electrocardiogram indicate a different course. The method has the advantages of causing no strain on the examinee and is independent of his cooperation.

-- Cond. from Bull. Hyg.

724 Programs for Weight Reduction in Industrial Groups. R. J. Murray and R. P. Jessup. Ind. Med. & Surg. 26, 249-252 (May 1957).

Group discussion classes on weight reduction are uniquely applicable to industrial medical practice. There is a realm of mutual interest and motivation that is not ordinarily found in other fields of group therapy. In the program reported, the executive groups were not put on a diet, but were gradually led into a form of living that adjusted their eating habits to sensible nutritional demands. Experience showed that use of an appetite-appeasing medication was helpful in the weight reduction program. Statistically, results exceeded expectations based on prior experience. -- Authors' summary

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725 Health in Industry. Mary E. Reilly. Bull. Natl. Tuberc. Assn. 43, 69, 70 (May 1957).

Even a small tuberculosis association can develop an effective industrial health education program within its community if it will analyze and help meet local need. Such a program is especially applicable to small plants, although such organizations should also work closely with the staffs of the medical divisions of the larger plants. Before management, labor, or employee groups are approached, the responsibility of each should be studied. Suggestions are given for the approach to each group. Features of a program include distribution of health literature, x-ray examinations of employees, and calling attention to the resources of other public health organizations.

CHEMICAL HAZARDS

726 Acute Ammonia Poisoning. 1. Plasma Coagulation Tests. H. Recine. Med. lavoro 47, 167-171 (Mar. 1956). Italian.

In the course of experimental research on ammonia poisoning the author studied the behavior of plasma coagulation tests. The results indicate direct damage in the form of prothrombinemia. -- English summary

727 Acute Ammonia Poisoning. 2. Serum Proteins, Paper Electrophoresis Studies. H. Recine. Med. lavoro 47, 172-175 (Mar. 1956). Italian.

In the course of experimental research on acute ammonia poisoning, the author presents studies of the serum protein changes by means of paper electrophoresis and discusses the results. -- English summary

728 Physiological Effects of Ozone. H. G. Clamann and R. W. Bancroft. Federation Proc. 16, 22 (Mar. 1957).

The LD_{50} of ozone for a three-hour exposure was found to be 12.6 ppm for mice and 25.7 ppm for guinea pigs. Death was caused by edema and hemorrhage of the lungs. Studies on five human subjects showed great differences in individual sensitivity. Irritation of the respiratory tract was observed at concentrations as low as 0.6 ppm after 30 minutes. Gross changes of respiratory function (reduction of vital capacity in more than 50%, and pulmonary edema) occurred after one hour at 6 ppm. The soft tissues of the respiratory tract seem to be the only tissues attacked by ozone. The sense of smell is definitely affected. An effect on the conjunctiva of the eye was neither felt nor observed by inspection. No effects upon blood and circulatory system were found.

729 Clinical Effects Associated with Inert-Gas-Shielded Arc Welding. M. Kleinfeld. Proc. Am. Acad. Occ. Med. 8, 91-95 (1956).

The process of inert-gas-shielded metal arc welding is described with special emphasis on the use of a consumable electrode. The hazards of the process include ultraviolet radiation, ozone, oxides of nitrogen, and metal fumes. Data obtained in a medical and environmental study of plants using this process are presented. The ozone hazard is emphasized in the light of severe illnesses which occurred. The difficulties in the diagnosis of ozone poisoning, the minimal chest findings in the presence of severe symptoms and roentgenographic abnormalities, and the prolonged morbidity are stressed. Appropriate control measures are described with emphasis on good engineering practice.
-- Cond. from author's summary

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730 Experimental and Clinical Contribution to Human Pathology Due to Sulfuric Acid Fumes. A. Morando. Med. lavoro 47, 557-561 (Oct. 1956). Italian.

Normal human subjects, not accustomed to inhaling sulfuric acid fumes, were made to inhale for 5-15 minutes air polluted with sulfuric acid concentrations from 0.35 up to 5 mg. per cu. m. Even at concentrations that are not subjectively detected by the persons under test, the respiratory flow rapidly increases and continues high until some minutes after the end of the test; the increase is more evident at higher concentrations. The increase in respiratory flow involves a reduction of the percentage of the acid retained in the respiratory system, and can be considered as a defense mechanism. Fifty-seven workers in the sulfuric acid production department were also followed up for several years; there was no evidence of a particular increase in the occurrence of bronchial or lung diseases, nor of conjunctival or pharyngeal irritation. Numerous cases of gastritis and gastroduodenitis, gastric ulcers, and digestive troubles were observed. Chronic exposures to relatively low concentrations of sulfuric acid as those to which the workers under examination were exposed, seem to produce gastro-intestinal tract lesions more easily than respiratory system lesions. -- Adapted from English summary (Bull. Hyg.)

731 Aluminum in the Environment. A Review of Its Hygienic Status. Irene R. Campbell, J. S. Cass, J. Cholak, and R. A. Kehoe. Arch. Ind. Health 15, 359-448 (May 1957).

This paper is an exhaustive review of the hygienic aspects of aluminum, based on the study of some 1,500 books, reports, and articles, of which about 500 are cited. The principal subjects discussed include: history of the development and uses of aluminum; chemical and physical properties and analysis; occurrence in the normal environment; aluminum in food; and use in medicine.

The history of aluminum in food begins with the addition of alum to flour to disguise inferior qualities, early in the 19th century in England. That practice was soon forbidden by law. Later the use of alum in baking powder became a subject of controversy. This controversy was settled by a publication of a report in 1914 by a Referee Board established by the U. S. Department of Agriculture, which presented the unanimous opinion of the Board that baking powders containing aluminum are no more harmful than are other baking powders but that it is wise to be moderate in the use of foods that are leavened with baking powder. However, the sale of baking powder containing aluminum is still forbidden in some European countries. Compounds of aluminum are also widely used in the preservation of pickles and fruits and in the manufacture of sugar and beer. Aluminum sulfate is used most extensively in the purification of drinking water supplies, and only traces of aluminum are present in the purified water.

When aluminum cooking utensils were first used, the question of health effects of aluminum in food from that source arose. A number of investigations have shown that the concentrations in foods cooked in aluminum fall well within the ranges found in raw products, except in isolated instances, and even in those cases, they fall short of physiologic significance. Investigations have also shown that the processing and packaging of foods in aluminum does not contribute to the destruction of nutrients over and above that caused by handling of food in the food industry; neither does it bring about any discoloration or change in the flavor of the product. In comparison with other materials designed for the same use the sanitary qualities of aluminum are equal or superior.

In the section on aluminum in the body, it is shown that only small amounts of aluminum in the tissues are produced by ingestion, topical application, and inhalation. Only in the case of injection of massive amounts is the aluminum content of tissues increased materially. Only in industrial experience has there been any basis for the opinion that the aluminum-containing earths or the metal itself may possess properties that may be inherently dangerous to man. Even here, difficulty has been encountered rarely and only under conditions of unusual urgency for production, and these sporadic difficulties, in the form of "Shaver's disease" and the "aluminum lung" have been highly questionable with respect to the role played by aluminum in the mixtures of raw materials and industrial products that are inhaled as dust. Moreover, these industrial hazards have been amenable to control by appropriate measures of industrial hygiene.

The medical uses of aluminum compounds include: use of aluminum hydroxide gel for treatment of peptic ulcers and gastric acidity; counteraction of the toxic effects of fluorides; treatment of dermatitis; removal of bacteria from the skin; other germicidal uses; control of excessive sweating; and prevention and therapy of silicosis.

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The use of organic aluminum compounds has introduced new problems, because they often penetrate the skin with comparative ease, and because their inhalation may cause more aluminum retention than in the case of inorganic dusts. These problems are not considered in this paper because they present a totally different type of situation from those with which the review is concerned.

The quantities of aluminum required to induce harmful effects are large (of the order of 100 mg. per kg., subcutaneously) as compared with those found in the body under the severest conditions of ordinary or occupational environment, or as compared with the quantities of metals and their compounds which are known to be dangerous. The quantities absorbed into the body are practically independent of the quantities in the environment, specifically in food and in the atmosphere. This means that a significant increase in human exposure to the present types of situations and compounds will result in no significant increase of aluminum in the body. New developments may create new situations which will call for investigation, but no such developments appear on the horizon. There are many interesting details in the paper not covered in this abstract.

732 Safe Handling of Alkylaluminum Compounds. J. E. Knap, R. E. Leech, A. J. Reid, and W. S. Tamplin. Ind. Eng. Chem. 49, 874-879 (May 1957).

Alkylaluminum compounds are becoming industrially important as catalysts for low-pressure polyethylene. They are extremely hazardous because of their reactivity, and must be protected from air, moisture, and other compounds with active hydrogen atoms by blanketing with inert gas during handling. Fire and personnel-burn hazards are increased by the possibility of exothermic addition reactions and metathetical reactions that liberate gases. Vapor toxicity tests (from unpublished reports by H. F. Smyth and C. P. Carpenter) show that under conditions simulating spills of one gallon of alkylaluminum compound per 2000 cubic feet of volume, two of six rats exposed to fumes from diisobutyl aluminum chloride for one hour died the same day of lung hemorrhage. The toxicity of triisobutylaluminum was somewhat less, but in either case it was termed "moderate". The animals were in obvious distress, which indicates that unconfined persons might be forced from an affected area. The fumes are white and have an unusual musty odor, and so are detectable even in small concentration. Other experiments show that the skin, even if protected by cloth or polyethylene sheeting, can be easily burned by the undiluted materials in the presence of air. Dilutions of 5 to 20% caused no reaction. Suggestions are given for treatment of burns and for safe handling of the compounds.

733 Sodium Diethyldithiocarbamate in the Treatment of Nickel Poisoning. B. West and F. W. Sunderman. Federation Proc. 16, 268, 269 (Mar. 1957).

Mice, rats, and rabbits were exposed to nickel carbonyl in concentrations found lethal to corresponding animals in previous experiments. One half of each group of animals were untreated and the other half received sodium diethyldithiocarbamate parenterally in doses of 50 to 100 mg. per kg. body weight immediately after exposure. No fatalities occurred in the treated animals, whereas the fatality rate was high in the untreated groups (80% in the mice). This compound was also found to protect mice receiving lethal amounts of nickel nitrate. Preliminary studies indicate that sodium diethyldithiocarbamate is therapeutically effective when administered orally. Excretion of nickel is increased by the treatment. Sodium diethyldithiocarbamate, per se, is relatively non-toxic; the LD_{50} value by either oral or intraperitoneal administration is approximately 1.5 g. per kg. body weight

734 Experimental Researches on Nickel Poisoning and Its Treatment with Calcium Disodium EDTA. U. Scudier and V. Tinazzi. Med. lavoro 47, 161-166 (Mar. 1956). Italian.

Rabbits were poisoned with nickel administered intravenously in the form of chloride. The fatal dose was determined to be 12 mg. nickel per kg. Calcium disodium EDTA proved able to save the animals, and showed positive antidotism when injected with fatal doses of nickel, whether administered before or up to one hour after the nickel. Its efficiency for clinical application is therefore considered probable.

-- Cond. from English summary

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735 Tolerance for Residues of Ethylene Oxide. Anon. Federal Register 22, 931 (Feb. 14, 1957).

A tolerance of 50 ppm is established for residues of ethylene oxide in or on whole spices, under the Federal Food, Drug, and Cosmetic Act. -- Chem. Absts.

736 Toxic Liver Injury. The Metabolism of Dimethylnitroso Amine. P. N. Magee. Biochem. J. 64, 677-682 (1956).

The metabolism, distribution in the body, and excretion of dimethylnitroso amine were studied after its administration to rats, mice, and rabbits. It has been shown previously that this compound is a selective liver poison in these species, and that it can produce malignant primary liver tumors in the rat. The evidence suggests that dimethylnitroso amine is rapidly metabolized, and that the liver is the main, probably the only organ concerned. The compound is distributed uniformly in most tissues of the body, and there is reason to believe that it penetrates into the intracellular space. There is no selective concentration in the liver. SKF 525A (2-diethylaminoethyl diphenylpropylacetate hydrochloride) inhibits the metabolism of dimethylnitroso amine in the mouse, but only when given in large doses. The findings are discussed in relation to the pathogenesis of the acute liver necrosis caused by dimethylnitroso amine. -- Chem. Absts.

737 Acute Changes in the Liver after Administration of Thioacetamide. D. N. Gupta. J. Pathol. Bacteriol. 72, 183-192 (1956).

Thioacetamide produces consistent liver necrosis after 24 hours in rats when a dose of 200 mg. per kg. or more is given by various routes. The first change apparent after six hours is the loss of glycogen and of basophilic bodies in the centrolobular liver cells. The central veins and the adjacent sinusoids dilate and edema channels appear which connect the central veins with each other. Necrosis develops in the centrolobular cells and spreads along the edema channels; by 24 hours it is well established. In 42-48 hours, the necrotic liver cells were cleared away by mononuclear cells which move into the necrotic zone at about 12 hours. Regeneration extends from the periportal zone and healing is complete after a week. The histological sequence of events to acute thioacetamide intoxication is non-specific, since it resembles that of many other liver injuries. The centrolobular necrosis is probably due to a number of factors. -- Author's summary (Biol. Absts.)

738 Biochemical Changes in Liver in Acute Thioacetamide Intoxication. C. H. Gallagher, D. N. Gupta, J. D. Judah, and K. R. Rees. J. Pathol Bacteriol. 72, 193-201 (1956).

The observed inhibitions in enzyme systems in liver are due to the accumulation of calcium in the affected liver cell. Administration of antihistamines protects against the action of thioacetamide. Adrenalectomy did not protect against thioacetamide intoxication. The evidence so far obtained suggests that the primary lesion in the liver cell is a loss of the semi-permeable properties of the cell wall with the entry of calcium ions. It is likely that the loss of this semi-permeable property is due to a direct attack on the cell wall rather than to a secondary effect resulting from a failure of the metabolic activity of the cell. -- Authors' summary (Biol. Absts.)

739 Tolerance for Residues of Sodium 2, 2-Dichloropropionate. Anon. Federal Register 22, 637 (Jan. 31, 1957).

A tolerance is established under the Federal Food, Drug, and Cosmetic Act for residues of sodium 2, 2-dichloropropionate as 2, 2-dichloropropionic acid of 35 ppm in or on cottonseed oil and 5 ppm in or on sugar beets and sugar-beet tops. -- Chem. Absts.

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740 Generalized Poisoning with Chlorinated Hydrocarbons in Harbor Workers. G. Paparopoli and V. Cali. Folia Med. 39, 819-831 (1956). Italian.

An intoxication by inhalation of 22 workers who were occupied with unloading grain disinfested with chlorinated hydrocarbons is described. The symptoms consisted of burning of the mucosas, asthenia, headache, vertigo, somnolence, gastroenteric disturbances, and, in some cases, loss of consciousness. Liver enlargement, renal impairment, and affection of the myocardium were found. The poisoning is ascribed mainly to tetrachloroethane rather than carbon tetrachloride and ethylene dichloride which were all present in the material used. -- Chem. Absts.

741 Eye Changes Due to Naphthalene. G. Ghetti and L. Mariani. Med. lavoro 47, 533-538 (Oct. 1956). Italian with English summary.

The authors report findings in 21 operatives who for about five years during the war and immediately afterward were working in an old plant where there was severe exposure to naphthalene. Out of the 21, 8 showed opacities of the lens. Only one was over 50 years of age, and two out of four persons of 20-30 years showed this lesion. The changes in the lens are in the peripheral parts and do not resemble the lens affections found in glass blowers or foundry workers. Experiments were carried out in rabbits: five were given napthalene orally; two died bulbar paralysis, and a slight diffuse opacity was seen in the lenses of the remaining three after enormous doses administered during 46 days. In two others the substance was instilled into the conjunctiva as an oily solution, and in one it was given parenterally. The results were negative. The authors conclude that the old apparatus allowed the ingestion and absorption of naphthalene and recommend that this possibility should be eliminated by proper construction of the plant.
-- Cond. from Bull. Hyg.

742 Health of Workers Manufacturing Silicones. J. Vrba. Pracovni Lekarstvi 8, 291-294 (1956). Czech.

Examinations of 49 persons revealed no specific toxic effects except individual cases of chronic irritation of respiratory passages and conjunctiva caused by chlorosilanes.
-- Chem. Absts.

743 Organic Peroxy-Compounds in Industry. T. D. Manly. Ind. Chemist 32, 271-276, 319-322 (July, Aug. 1956).

The author gives a general description of the properties of organic peroxy-compounds and their industrial applications and discusses possible future developments. The extreme instability of these compounds introduces a number of hazards. They undergo a gradual decomposition at ordinary temperatures, producing carbon dioxide, methane, ethane, and sometimes oxygen. Containers must therefore be vented. The rate of decomposition rises with temperature. Benzoyl peroxide, for instance, decomposes vigorously at 100° with evolution of white fumes which are flammable. All the organic peroxides are flammable and explosive if confined. Metallic compounds are not as effective catalysts for the decomposition of these compounds as for hydrogen peroxide, but contact with metals should be avoided. There is no known major physiological hazard associated with the organic peroxides as a class. Peracetic acid is corrosive to the skin and especially to the eyes, and the vapor is strongly lachrymatory and irritating. The ketone peroxides and t-butyl hydroperoxide are irritating to the skin. Cumene hydroperoxide is non-corrosive to the skin, but, if left in contact, it decomposes to form phenol, which can cause serious burns. The decomposition of organic peroxides has been widely studied from the physical standpoint, but little has been published on their hazardous behavior.

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744 Toxicity of m-Aminophenol. H. Ozawa and others. Ann. Rept. G. Tanabe Co., Ltd. 1, 35-43 (1956).

The acute and chronic toxicities of m-aminophenol were studied. When it is administered intravenously, its LD_{50} is 500 mg. per kg. for rabbit and 340.7 mg. per kg. for mice, and below 100 mg. per kg. no toxic effect could be observed. Daily 20 mg. per kg. subcutaneous injections for two months caused no noticeable symptoms in rats. p-Aminosalicylic acid is said to be contaminated with m-aminophenol at a level of not more than 0.03%, but from the above results, it is thought that PAS injection would cause no harmful effect due to m-aminophenol, even if administered daily to man. -- Chem. Absts.

745 Toxic Hazards of Pesticides to Man. Report of a Study Group. World Health Organization Technical Report Series No. 114. 51 pp. (June 1956). Obtainable from World Health Organization, 1501 New Hampshire Ave., N. W., Washington 8, D. C. 60 cents.

Recommendations are made to enable more toxic insecticides of all types to be used safely in public health work. Subjects included in the report are: toxic properties of pesticides, incidence and nature of poisoning, measures for the protection of operators handling pesticides, contamination of food and water, effects on domestic animals and fish, control of pesticide hazards by means of regulations, laboratories carrying out investigations on the vertebrate toxicology of pesticides, the degree of exposure of workers to insecticides and the relation of this exposure to the toxic dosage, and respirators and dust masks suitable for pesticide operators. -- Public Health Eng. Absts.

746 Tolerance for Residues of Monuron (3-(p-Chlorophenyl)-1, 1-dimethylurea). Anon. Federal Register 22, 786 (Feb. 8, 1957).

The tolerance previously established for asparagus is revised to 7 ppm. The tolerance for citrus citron, cottonseed, grapefruit, grapes, kumquats, lemons, limes, onions (dry bulbs only), oranges, pineapple, spinach, sugarcane, tangelos, and tangerines is 1 ppm. -- Chem. Absts.

747 An Outbreak of Tri-ortho-cresyl Phosphate (TOCP) Poisoning in Durban. M. Susser and Zena Stein. Brit. J. Ind. Med. 14, 111-120 (Apr. 1957).

An outbreak of TOCP poisoning in 11 African patients in Durban, South Africa, in 1955, is described. From the epidemiology of this outbreak it is suggested that water, as well as the previously reported solvents such as lipids and alcohol, may be a vehicle for the poison, either in solution or suspension or both. The clinical picture, which includes a delayed flaccid paralysis with subsequent upper motor neurone signs, is emphasized as an important and reliable guide to diagnosis. The pathology and etiology of the nervous lesions are discussed. Swelling of the parotid glands is reported in this outbreak for the first time. Family, social, and occupational factors are shown to be important in diagnosis. A follow-up after 18 years on four patients poisoned in 1937-38 shows that disability may be profound and permanent. The necessity for precautions in industry is stressed. -- Cond. from authors' summary

748 Tolerance for Residues of Mineral Oil in or on Shelled Corn and Grain Sorghum. Anon. Federal Register 21, 10274 (Dec. 21, 1956).

A tolerance of 200 ppm for residues of mineral oil in or on shelled corn and grain sorghum from postharvest application is established under the Federal Food, Drug, and Cosmetic Act. -- Chem. Absts.

749 Environmental Aspects in the Etiology of Occupational Cancer. A. J. Vorwald. CA (Am. Cancer Soc.) 7, 21-26 (Jan. 1957).

The literature on environmental and occupational factors in cancer is reviewed. A table lists environmental agents in the etiology of malignant tumors, with an appraisal of current evidence having possible relation to occupation. Both in the experimental and

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the clinical approach, it is apparent that studies of the environment in the interest of cancer, especially of the lung, are complicated by a host of variables which cannot always be determined with certainty in the light of present knowledge. The clinical studies are further complicated by divergent susceptibility, the varied intensity of exposure, and the long interval between exposure and diagnosis. While it cannot be denied that environmental cancer occurs it must also be admitted that the full elucidation of occupational cancer awaits further refinement of experimental, clinical and epidemiological studies.

INDUSTRIAL DUSTS

750 Water Infusion. J. Platt. Coll. Guard. 193, 306-307 (Sept. 6, 1956).

Water infusion stands first among steps taken to minimize the production of dust in coal mines. The high pressure of water also loosens the coal and makes it easier to work, giving possibly a 10% greater output. A recently devised infusion tube improves the application of the process. The tube, through which the water is introduced under pressure, is provided with a rubber seal or collar, which expands under the pressure and so prevents the water from escaping. The principle of the tube is illustrated. A new type of pump used in high pressure infusion is also described. High-pressure water infusion has made possible periodical, as opposed to shift-by-shift, infusion. Under suitable conditions high-pressure water infusion combines the ideals of safety and production. -- Cond. from Bull. Hyg.

751 Eliminating Dust in Chemical Plant. R. Hammond. Chem. Age (London) 77, 431-433 (Mar. 9, 1957).

Efficient removal of dust from air and flue gases is of great importance to the chemical industry, both for health of workers and for purity of the products, and many interesting techniques have been developed. Standard equipment comprises a collector, an exhaust fan, ventilating hoods, ducting, and piping to carry the collected material to a place of disposal. The collectors described include a multi-wash collector, a high efficiency filter, and electrostatic precipitators. A number of features of each are discussed.

752 Radiological Surveys of Working Quarrymen and Quarrying Communities in Caernarvonshire. T. F. Jarman, J. G. Jones, J. H. Phillips, and H. E. Seingry. Brit. J. Ind. Med. 14, 95-104 (Apr. 1957).

Results of a radiological survey of 2,432 working quarrymen from five slate querries are reported and compared with those of an earlier survey of coal miners in the Rhondda Fach district. The prevalence of pneumoconiosis of category 2 and upwards was 83 per 1,000 quarrymen examined, against 300 per 1,000 miners and ex-miners in Rhondda Fach. The prevalence of infectious tuberculosis, however, was higher in the quarrymen; 5.3 per 1,000 in contrast to 1.4 per 1,000 in the miners. A radiographic survey of 75% of the total population of a part of the quarrying district was also conducted. The tuberculosis rates were higher in the quarrying district than in the mining district, for quarry and ex-quarry workers, males not engaged in quarrying, and females, but the ratio was lowest in females. It would appear that quarriers and males not engaged in quarrying but living in quarrying communities are more likely to contract tuberculosis than miners and males not engaged in mining in a coal-mining valley. Though it has not been definitely proved that the pneumoconiosis of quarry workers is responsible for this difference, the findings suggest that working in the slate quarriers may be an important contributory and perhaps a major determining factor. -- Cond. from authors' summary

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753 Silicosis Hazards in Enameling. A Medical, Technical, and Experimental Study. L. Friberg and H. Ohman. Brit. J. Ind. Med. 14, 85-91 (Apr. 1957).

Medical, technical, and experimental investigations of the silicosis hazards in a Swedish enameling shop employing 35 men are described. In the last 20 years six established and two suspected cases of silicosis have occurred. In three of the men the disease caused partial disablement. The most dangerous operations appeared to be the preparation of enamel powder and spraying ground-coat enamel on inner surfaces. The men were exposed to fairly high concentrations (mean values 10 to 75 million particles per cu. ft., impinger method) of a dust containing about 50% quartz. The dust displayed distinct fibrogenic potency in rats and had substantially the same effects as quartz. In other operations where the dust concentrations ranged from 9 to 16 mpcf, the quartz was present only in small amounts, it was difficult to determine whether there was a silicosis risk. Two of the enamels produced suspected silicotic lesions in rats. These two enamels, therefore, may be more toxic than their quartz contents indicated. Attention should be directed to the operations such as spraying of inner surfaces, in which relatively high dust concentrations occur.

-- Cond. from authors' summary

754 Radiologic Aspects and Meaning of the Involvement of the Pulmonary Circulation in Patients with Silicosis. R. Ghislanzoni and D. Zannini. Minerva med. 47, 1901-1910 (Dec. 8, 1956). Italian.

The roentgenologic findings in a group of 150 patients with silicosis and silicotuberculosis were studied and compared with the clinical and electrocardiographic findings. The pulmonary vessels stood out clearly and their shadow was different from that of the hilum and of the parenchyma. Ectasia, deformities, and blocking of the pulmonary vessels were noticed. These alterations are an early sign of involvement of the pulmonary circulation; they may appear even before the electrocardiographic and clinical signs of silicosis. The patient should be kept under observation when the radiologic findings are positive even though the electrocardiographic and clinical signs are negative. The cardiovascular system is already involved when the roentgenologic findings are positive and the other findings are suspected or uncertain.

-- J. Am. Med. Assn.

755 Biochemical-Biophysical Contribution on the Hyaline Tissue in Silicosis. E. C. Vigliani. Zentr. Arbeitsmed. Arbeitsschutz 6, 253-255 (Nov. 1956). German.

The author reviews published work conducted at the clinic for industrial medicine at Milan University and summarizes other literature on the constitution of the nodular and massive hyaline tissue in silicotic lungs. The Milan researches include chromatographic methods on the synthesis of the amino acids, spectrographic examination, the use of polarized light, chemical analyses, and biophysical research with x-ray spectrography. It was established that the hyaline tissue in silicosis differs from that of other origins. The latter type of hyaline tissue is composed almost altogether of collagen, whereas in the silicotic type collagen constitutes less than half of the total protein; the rest is globulin, chiefly beta-globulin. It seems that silicotic hyaline occupies a position between typical connective tissue hyaline and that of certain pathological tissue substances such as amyloid. Recent chemical researches have shown that amyloid is composed chiefly of beta- and alpha-globulin. Considering that the immuno-biological theory of the pathogenesis of amyloid tissues is supported by authoritative researches, the similarity of silicotic hyaline to amyloid is an argument of some value for the opinion that in the development of silicosis antigen-antibody reactions are also of importance.

-- Cond. from Bull. Hyg.

756 Electron Microscope Studies of the Structure of the Walls of the Alveoli of the Lungs. N. Dettmer. Beitr. Silikose-Forsch. No. 45, 17-42 (1956). German.

The examinations were carried out on the lung of mouse, rat, and horse, fixed immediately after the animal was killed, and treated with 1% osmic acid by procedures which are described. The magnifications varied from 15,000 to 30,000. The examinations showed a continuous cytoplastic layer spread over the whole alveolar surface. This layer was so thin, especially over the capillaries, that it was beyond the power of resolution of

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the light microscope. Incidentally, it seemed that a particle with sharp angles, such as a quartz particle, could easily pierce the layer. It was limited on both the air-space side and the connective tissue side by an osmium-staining cell membrane; a basal membrane was not found. The partition between the blood and the air space consisted of seven layers. In places where the capillaries were not in immediate apposition to the alveolar wall the cellular tissue space was filled with connective tissue fibrils, lattice threads, elastic fibers, and connective tissue cells. Various cells, detached from the alveolar walls, and septal cells were found, but a definite decision could not be reached on their origin. -- Cond. from Bull. Hyg.

757 Silicosis. 11. Effect of Sex Hormones on the Amount of Silicon Excreted into Urine. M. Anme. Nagasaki Igakkai Zassi 31, 381-385 (1956).

Urinary excretion of silicon before and after castration was investigated. In the case of male rabbits silicon increased after castration while in the case of females it decreased. Silicon returned to the normal level after the administration of male hormone or follicular hormone. Corpus luteum hormone showed no effect. -- Chem. Absts.

758 Silicosis. 12. Influence of Thyroid Hormone on the Amount of Silicon Excreted in the Urine of Rabbits. R. Kakita. Nagasaki Igakkai Zassi 31, 438-445 (1956).

Thyroidectomy increased the urinary excretion of silicon by 2 to 3 times, and silicon returned to normal level after the administration of thyroid hormone. Injection of methylthiouracil to normal rabbits increased silicon slightly. Diiodotyrosine and anterior hypophyseal hormone showed no effect. -- Chem. Absts.

759 The Neutralization of Silica Toxicity in Vitro. J. Marks. Brit. J. Ind. Med. 14, 81-84 (Apr. 1957).

Phagocytic cells were protected in vitro against the toxic effect of silica dust by compound 48/80, a histamine-releasing agent formed from p-methoxy-phenylethyl-methylamine. The health of the cells was studied by direct microscopy and by measurement of their glucose consumption and dehydrogenase activity. The mode of action of compound 48/80 is not known but may depend on a reduction in silica solubility. A slight protective action was also exhibited by certain alkylmono-amines and polymyxin B. -- Author's summary

760 Pulmonary Fibrosis and Giant-Cell Reaction with Altered Elastic Tissue. Endogenous "Pneumoconiosis". R. L. Walford and L. Kaplan. Arch. Pathol. 63, 75-90 (Jan. 1957).

The clinicopathologic findings in 12 autopsied cases of a peculiar pulmonary elastica disease are presented and discussed. It is concluded that injured pulmonary elastic tissue may act as a foreign body or sequestrum and produce a progressive "pneumoconiosis". -- Cond. from authors' summary

761 Asbestosis with Pleural Calcification among Insulation Workers. J. Frost, J. Georg, and P. F. Moller. Danish Med. Bull. 3, 202-204 (Nov. 1956).

In Denmark only a few persons manipulate insulation products including asbestos, kieselguhr, magnesia, glass wool, and rock wool. The first two have been regarded as fibrogenic to the lungs when their dust is inhaled. In order to ascertain any occupational risk in the work 31 workers with more than 20 years' exposure, of 52 years average age, were carefully examined clinically and by x-ray. Abnormalities were found in the surprising number of 22. A total of nine exhibited fine mottling indicative of pulmonary asbestosis. In 19 patients pleural changes were seen, which were due to adhesions and extensive thickening with calcification. The abnormalities in the pleura were so widespread in some instances as to obliterate other pathological changes. The calcification is unusual and may be ascribed to combined exposure to calcium and magnesium in the presence of fibrogenic asbestos dust. Sample analyses of the kieselguhr in use did not reveal the presence of alpha-quartz. The finding of pronounced bilateral pleural changes in the present series definitely points to an occupational origin. -- Cond. from Bull. Hyg.

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762 Experimental Pneumoconiosis. J. Horta and C. Cancela. J. Soc. Ciencias Med. Lisboa 5, 120 (1956). Portuguese.

The authors found in many men working with cork a pulmonary illness resembling tuberculosis but without tubercle bacilli in the sputum. When these patients were away from their work their cough, dyspnea, and general condition improved quickly. In the belief that the pneumopathy was caused by the inhalation of cork dust, the authors exposed rabbits and guinea pigs for long periods to the conditions of the patients' work and injected sterile cork dust intraperitoneally and in the pulmonary veins of the animals. This caused a severe reaction in the lungs, with proliferation of the large alveolar cells, increased number of the septal fibroblasts, and even the formation of fibrotic nodules. The production of this experimental illness suggests that also in man there is a pneumoconiosis produced by cork dusts.
-- J. Am. Med. Assn.

763 An Outbreak of Weaver's Cough Associated with Tamarind Seed Powder. R. Murray, J. Dingwall-Fordyce, and R. E. Lane. Brit. J. Ind. Med. 14, 105-110 (Apr. 1957).

An unusual and widespread outbreak of cough and dyspnea occurred among weavers of viscose yarn, in which tamarind seed kernel powder had been used as a sizing agent. The condition appeared to be a reaction to a constituent of the size. Fungicides and fungi were eliminated as causative factors. An allergic reaction rather than an infective or irritant factor is indicated. As the use of the suspected size has been discontinued, confirmation of these hypotheses can only be obtained by inducing a reaction under controlled conditions. Such experiments are now in progress. -- Cond. from authors' summary

PHYSICAL ASPECTS OF THE ENVIRONMENT

764 Environment for Measuring Noise. H. B. Karplus. Noise Control 3, 19-22, 82 (Mar. 1957).

The measurement of octave-band sound-pressure levels is now a relatively simple standard procedure. However, the measurements depend to a large degree upon the environment of a given noise source. Two ideal environments are often used: the free field, and the reverberant field. In the free field method, reflection of sound is reduced to a minimum by the use of acoustic materials. The reverberant field method utilizes the fact that the sound-pressure level in a room with low absorption is very uniform and depends only on the total power fed in and the absorption. Both methods are discussed mathematically and experiments are described showing how uniform conditions can be obtained in the reverberant field method.

765 Evaluation of Four Methods for Determining Sound-Power Output of a Fan. W. F. Kerka Heat. Pip. Air Cond. 29, 139-146 (Apr. 1957).

Four methods of determining the sound-power output of a fan by octave-band analysis were investigated. Measurements within the duct by an anechoic termination at the end were used for determining the sound power delivered by the fan to the duct system. The free-field and reverberant-room methods were employed in finding the sound power radiated into a space from the inlet and discharge ducts. The acoustic power in the space is dependent upon both the sound-power output of the fan and the size and location of the duct openings. The acoustic power at the duct opening was found from measurements made at the periphery, with and without air flow, and at the open face without flow. In the 300 to 600 cps band and above, all of the methods correlate within 6 db. Measurements made within the duct indicate that the energy level within the duct in the lower frequencies is greater than that which is radiated from the duct opening. This is in accordance with theoretical findings. Recommendations are made for adapting the test methods

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766 The Use of the Audiogram in Industry. W. G. Talmage. Proc. Am. Acad. Occ. Med. 8, 99-110 (1956).

A discussion of the audiometer and its use in industry is presented. The results of seven years of pre-employment and annual routine audiograms on all employees of an explosives plant showed that a large percentage of men seeking employment had already developed impaired hearing. Some notes on a practical method of doing and recording audiograms, and a brief discussion of acoustic trauma is offered, with suggested formulas to help in the determination of the amount of hearing loss due to noise as only one of several contributing factors in deafness. All pre-employment examinations should include audiometer testing. Repeated tests for noise sensitivity should be carried out on all employees exposed to potentially dangerous noise levels. All noisy locations and other possible causes of occupational deafness should be discovered and eliminated.

-- Cond. from author's summary and conclusions

767 Audiometers and Their Use. R. E. Allison. Noise Control 3, 40-43, 90 (Mar. 1957).

Since pure-tone tests show the presence of ear damage due to noise more readily than speech tests, most of the discussion deals with audiometers for pure-tone testing purposes. They are classified as screening, group, automatic, and diagnostic audiometers, and, the principles and practical applications of each type are discussed. Speech audiometers are also considered briefly.

768 Evaluation of Hearing Impairment Due to Industrial Noise. G. V. Schulthess. Arch. Otolaryngol. 65, 512-520 (May 1957).

This paper deals with a method developed by Ruedi to test individual susceptibility to noise injury. Through stimulation with a calibrated white noise, the authors investigated the perstimulatory and poststimulatory influence of this exposure on the perception of pure tones of 1000 and 4000 cps. A modified Bekesy audiometer was used for this purpose. Test subjects that were found to be sensitive to noise influence in this manner definitely required a longer recovery time after exposure to factory noise than did resistant persons. After the administration of vitamin A, both the individual and the average recovery time seemed definitely shortened. Investigations with shift workers confirmed the findings.

-- Author's summary

769 Possibilities and Requirements for the Management of Industrial Deafness. H. G. Kobrak and E. Domeier. Arch. Otolaryngol. 65, 509-511 (May 1957).

The advantages of facilities for a rapid audiometric test are stressed. The automatic testing device described permits testing of large numbers of workers without skilled personnel. The tone source is a tape recorder. The tone is synchronized with a certain paper blank, so that the arrangement of the squares on the paper harmonizes with the test tones. Speech tests are possible. Mass intelligence tests can also be done by the machine.

-- Cond. from authors' summary

770 A Mobile Laboratory for Group Hearing Tests. J. R. Cox, R. W. Benson, and A. F. Niemoller. Noise Control 3, 44-48, 92 (Mar. 1957).

The mobile laboratory has proved to be a useful facility for making hearing measurements in the field. It is relatively easy to move about and has proved itself seaworthy on the hangar deck of two aircraft carriers. The design of the laboratory itself has, on the whole, proved satisfactory, but some improvements in noise isolation are suggested. The group audiometer has proved satisfactory for making comparison between groups of men and between before and after exposure tests taken on the same group of men. Certain shortcomings, however, are discussed. In spite of them, the audiometer has performed well the task set for it. It is simple, fast, and not particularly costly. The audiograms obtained appear to be reliable.

-- Cond. from author's conclusions

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771 Occupational Hearing Loss. Occ. Health Bull. 5, No. 1. 4 pp. (1957). Bureau of Adult and Occupational Health, New Jersey State Department of Health, Trenton, N. J.

The fundamentals of hearing conservation programs are presented briefly, including: factors influencing loss of hearing, major objectives of a hearing conservation program, noise level studies, pre-placement examinations, factors to be considered in audiometric tests, periodic rechecks, and ear protectors. Noise reduction is considered very briefly, but full discussion will be presented in a future bulletin.

772 Legal Aspects of the Hearing Loss Problems. N. S. Symons. Noise Control 3, 49-56 (Mar. 1957).

The very complex problem of occupational loss of hearing in relation to workmen's compensation is discussed extensively. There is at present no single magic answer to the industrial noise problem on a scientific or any other level. It can be solved in each state only by patience, cooperation, and willingness to appreach the problem objectively. Compensation for hearing loss involves such questions as: (1) what noise levels are injurious; (2) what is the proper method of determining occupational hearing loss as distinguished from other causes including aging; (3) what hearing losses are disabling and what criteria should be used in defining disability; (4) what will be the effect if departure from the wage-loss principle is sanctioned by granting awards for noneconomic, physiologic, or social losses; and (5) how the grave problem of accrued liability can be handled. Problems that occur in estimation of hearing loss are discussed, including: (1) elimination of minor losses; (2) choice of frequencies; (3) presbycusis deductions; (4) binaural method of computing percentage loss; and (5) use of best of several audiograms. The compensation laws of New York and Wisconsin are discussed, and laws of other states are considered briefly.

In attempting to solve the hearing loss problem, the following considerations should be kept in mind: (1) The humanitarian problem of prevention and elimination of the hazard should be continually stressed; (2) The economic approach to the problem should be conservative; (3) The problem should be studied from a long range viewpoint and the various income protection programs should be integrated; (4) The approach should be neither pretentious nor opinionated; (5) The problem should be simplified; and (6) The problem presents a unique opportunity for cooperation among all groups concerned.

773 Problems of Industry in a State with Hearing Loss Compensation Laws. R. A. Ewens. Noise Control 3, 57, 58, 86 (Mar. 1957).

The history of compensation for hearing loss in Wisconsin is reviewed, with special attention to the work of the advisory committee, which has been functioning for 30 years and consists of representatives from industry, labor, and insurance companies. The recommendations of this committee have been largely incorporated in the present law. Features of this law are discussed. The Wisconsin Manufacturers' Association has been advocating the use of audiometer tests in pre-employment physical examinations, but so far the campaign has not been successful. The problem finally resolves itself to a question of legislative action, and an educational program directed to legislative bodies should lead to such action.

774 Acoustical Engineering Principles for Noise Reduction. W. M. Rees. Noise Control 3, 59, 60, 84 (Mar. 1957).

The haphazard application of acoustic engineering principles to noise problems may produce unexpected and often undesired results. The author outlines methods for obtaining the maximum effectiveness from each engineering technique used. The general types of control are: control of noise at its source; control of structure-borne sound; and control of airborne sound. No one of these controls may be the full answer to a specific problem; all three may be required. The steps in noise control are thus summarized: (1) Determine the real reason for the noise problem; who is the objector who must be satisfied? (2) Determine what it takes to satisfy him and how he will judge the results; (3) Consider the noise source and how you can reduce it; (4) Look for ways to isolate or segregate it; and (5) Reduce the annoyance factor and the general noise level by reverberation control with acoustical treatment.

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775 Retaining High Sound-Transmission Loss in Industrial Plants. G. L. Bonvallet. Noise Control 3, 61-64, 92 (Mar. 1957).

It is one thing to enclose an intense sound source such as a modern jet engine behind 12-inch poured concrete walls, and it is another to take full advantage of the sound attenuation provided by such walls, because sound leaks creep into the picture. This presentation describes means of providing high attenuation and points out the importance of leaks. The advantages of double walls are demonstrated. A number of examples are given in which closing of cracks, using fewer windows, and similar means produced better sound attenuation. Methods of measuring sound attenuation are described. The average transmission loss is a convenient figure, but for some work further attention should be paid to sound reduction at high or low frequencies, depending on the requirements of the job at hand.

776 Use of Partial Enclosures to Reduce Noise in Factories. D. E. Bishop. Noise Control 3, 65-69, 82 (Mar. 1957).

Complete enclosure of a noise source is often impracticable, but noise reduction can be accomplished by partial enclosure if properly designed. The following general principles should govern the choice and design of partial enclosures: (1) Where large reductions of noise are required the percentage of open area of the enclosures must be kept very small; (2) Partial enclosures having considerable open area can provide moderate reduction over restricted horizontal angles; (3) Enclosures with a top are preferable, but open-top enclosures can be effective if the gap between the top of the enclosure and the ceiling is kept small and the ceiling is lined with sound-absorbing material; and (4) Partial enclosures are most effective outdoors or in factory-type rooms and least effective in regular rooms which have little sound absorption. -- Cond. from author's summary

777 Aircraft Noise and Building Design. A. C. Pietrasanta. Noise Control 3, 11-18, 88 (Mar. 1957).

Engineering procedures have been presented that can be used with relative ease in analyzing and solving noise problems caused by the interference of jet aircraft noise with speech communication and performance of tasks in nearby office buildings. These procedures utilize the latest information on estimating noise levels from jet aircraft operations and also the most recent thinking on the application of office noise criteria in intermittent-noise situations. They can be used in many ways: for example, to determine the requirements for an adequate wall structure, to aid in the selection of a building site or a site for run-up operations, and to evaluate the effect of re-orienting ground run-ups and using shielding structures and run-up noise suppressors. -- Author's summary

778 Materials and Techniques for Damping Vibrating Panels. R. N. Hamme. Noise Control 3, 23-26, 86 (Mar. 1957).

Vibration damping techniques correctly applied to panel systems can yield large-magnitude noise reductions. The range of application of these techniques and appropriate methods and materials are discussed. -- Editor's summary

779 Noise Reduction in Pumps and Pump Systems. N. L. Meyerson. Noise Control 3, 27-32, 91 (Mar. 1957).

Objectionable noise and vibration from a pump system is not necessarily due to the pump. The chief causes of noise investigated were, in order of decreasing importance: (1) improper mounting, line-up, and isolation of the system; (2) excessive use of pipe fittings, poor piping, sharp bends, and noisy valves; (3) poor maintenance of equipment, which resulted in several noisy conditions; (4) misapplication and off-design operation of pumps; (5) noisy transmissions; and (6) unbalance in pump or motor. Application of reasonable care to the details of pump selection and operation, pipe and fitting selection, isolation and absorption techniques, and proper maintenance will insure quiet and vibration-free service from any pump system. -- Cond. from author's summary

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780 Noise Control by Phase Control of Extended Sources. G. J. Thiessen. Noise Control 3, 33-36, 90 (Mar. 1957).

The author presents a report on the control of noise from paper mill couch roll and presents a graphic technique for determining couch roll drilling patterns. The operation of the couch roll is described, and the technical discussion includes: energy flow in a siren, efficiency of a linear array of point sources with linear phase variation, and efficiency of the array with periodic phase variation.

781 The Acoustical Design of Enclosures for Power Transformers. T. D. Northwood, L. B. Smith, and E. J. Stevens. Noise Control 3, 37-39, 86 (Mar. 1957).

This paper discusses the design of enclosures for controlling the noise from large power transformers. The design of ventilating ducts and resonant absorbers for lining enclosures is described. -- Editor's summary

782 Noise Control for Offices Located Near Production Machines and Mechanical Equipment Spaces. L. N. Miller and I. Dyer. Noise Control 3, 70-75 (Mar. 1957).

There is no fixed or stereotyped solution to noise problems. Each problem is solved on the basis of the amount of noise reduction required and the analysis of noise and vibration levels along the various paths from the noise to the receiver. A number of case histories are presented showing variations in the approach to the problem. In older offices several types of remedial measures can usually be found; for new offices, noise problems can frequently be resolved by proper office location relative to noisy areas and by intelligent use of readily available materials and techniques now in widespread use.
-- Cond. from authors' conclusion

783 The Why, How, and Cost of Eye Protection. R. A. Sherman. Safety Maintenance 113, 20-24 (May 1957).

Some of the basic ingredients of a successful eye protection program are: (1) indoctrination of workers and supervisors, especially by meetings with safety committees, foremen, labor representatives, and others concerned; (2) a vision testing program; (3) a dispensing and maintenance program; and (4) cooperation by professional eye men or the services of a professional consultant. Expected results from an eye protection program include: (1) elimination of losses of one or both eyes; (2) reduction of first aid eye injuries; (3) decrease of lost time eye accidents to a low percentage; (4) improvement in productivity; (5) accident reduction by better seeing; (6) reduction of damage to equipment; (7) improvement in job satisfaction; (8) greater awareness of over-all safety practices; and (9) reduction of insurance costs. The average cost of all protective glasses, including prescription and plano lenses, is estimated at $5.00, not including examination or fitting fees. Administrative and accessory costs may average $4.50 per pair of glasses. Maintenance costs vary, but may be roughly estimated at $1.60 per pair per year. References are given to available literature.

784 Report of Glaucoma Survey at Frankford Arsenal. L. P. Devlin. Proc. Am. Acad. Occ. Med. 8, 96-98 (1956).

In the examination of 3,213 persons over 40 years of age, 37 unsuspected cases of glaucoma were discovered. The benefit of this survey to industry was the prolongation of the usefulness of 37 employees for an estimated 8 years each. On that basis the cost of the survey was $8 per man year per patient, and the increased morale and personal satisfaction of the 3,176 glaucoma-free employees was a benefit the Arsenal obtained without cost. Recurrent glaucoma surveys are necessary, easy to accomplish, productive, and economical. -- Cond. from author's summary

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785 Fine Water Spray as a Method for Improving Atmospheric Conditions in Heated Spaces. I. M. Erman. Z. artzl. Fortbild. 50, 950-955 (Nov. 15, 1956). German.

This paper describes the results of investigations to support the author's opinion that moistening the air in a heated space by means of a water spray can have a distinctly better effect on the workers than has hitherto been claimed by other investigators. In a series of experiments, the results of which are described and tabulated, it was shown that a fine spray of water (droplet size should not exceed 50-60 microns in diameter) introduced into a room heated to 40-42°C (104-108°F) caused a diminution of the temperature of the skin of forehead and chest, lowering of body temperature, lowering of the pulse and respiration rates, and increase in the pulmonary ventilation of the individuals under test. The workers also stated that the air was made fresher and that breathing became easier and more comfortable. Water spraying is also of value in lowering the temperature of the surroundings and in laying dust. The subject is discussed at some length with regard to circumstances in which the water spray may or may not have hygienic value.

-- Cond. from Bull. Hyg.

RADIOACTIVITY AND X-RADIATION

786 Sources of Information on Nuclear Energy. Data Sheet D-46. National Safety Council, 425 North Michigan Ave., Chicago 11, Ill. Natl. Safety News 75, 40, 42 (May 1957).

This Data Sheet comprises a list of books, pamphlets, bulletins, and articles dealing with safety aspects of nuclear energy.

787 Chemistry and the Peaceful Uses of the Atom. W. F. Libby. Chem. & Eng. News 35, 14-17 (May 6, 1957).

The chemist and chemical engineer will have active roles in the development of peaceful uses of atomic energy, with regard both to economy and to safety. The principal areas where the chemist or chemical engineer may aid in reducing reactor hazards are probably in the reactor core itself and in methods for reducing the fission product hazard in the cloud before it leaves the containment sphere. Specific problems mentioned include producing radioactive strontium in an insoluble form and the safe use of plutonium. Other subjects discussed are costs of atomic power and the important part isotopes already play in medicine.

788 The Design of Reactor Systems for Safety. C. R. McCullough. Mech. Eng. 79, 251, 252 (Mar. 1957).

The necessity of safety considerations at all stages in the design of a reactor system is emphasized. The potential hazard to the public is made up of fission-product inventory, probability of accident, and its probable severity in some complicated reaction. If the job is done properly, the hazard to the public is well within the acceptable limit. The potentiality of accidents is largely dependent upon the skill with which the design and testing work are done. The two steps to the problem of reactor safety are: keeping the flux level of the reactor under control at all times, and maintaining the cooling in reactor at all times. At this stage of atomic energy the matter of judging the safety of an atomic-energy power facility is one of subjective judgment based on the available data. There are no generally applicable standards. In the design of reactors today we are probably imposing restrictions in many cases where they are really unnecessary, but they must be imposed at the present time, because of our ignorance as to their effect on the safe operation of the machine.

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789 Radiation-Hazard Control for a Power Reactor. G. H. Whipple. Mech. Eng. 79, 253-257 (Mar. 1957).

The recommended maximum permissible exposure of 0.3 r per week has a small but possibly significant risk for a lifetime occupational exposure. It has been demonstrated that reactor plants can be designed and operated with an average level considerably less than 0.3 r per week. The additional cost of a reactor plant designed for average exposure levels less than 0.3 r per week will probably be recovered many times over by savings in operating costs. In keeping with good engineering practice, which always includes a safety factor in any design, it is recommended that 0.03 r per week be taken as the design criterion. -- Author's conclusions

790 Radiation Exposure Patterns Aboard the USS Nautilus. J. H. Ebersole. New Eng. J. Med. 256, 67-74 (Jan. 10, 1957).

The increasing need for profession-wide knowledge of radiation control practices is emphasized. The radiation control program used aboard the USS Nautilus is described and is presented as a unique application of radiation safety principles. The radiation exposure pattern of the ship during a year's operation is presented, stressing the very low exposures encountered. It is believed that, given similar good engineering design and conservative shielding practices, this pattern can continue in nuclear installations of the future. -- Author's summary

791 Atomic Energy Commission: The Safety and Accident Record to Date. D. F. Hayes. Natl. Safety News 75, (JASSE Section) 19-24 (May 1957). (From an address at a special conference of American Management Association).

A series of tables lists radiation accidents in atomic energy activities and reports the general exposure records in routine operations of AEC contractors. In 11 years between August 1, 1945, and July 31, 1956, there were 16 radiation accidents in which 69 persons were overexposed to radiation. In eight cases only one person was involved. In another instance 28 servicemen were overexposed by an unexpected concentration of fallout after a 1954 weapons test. Of the 69 exposed only two died, in 1945 and 1946. Of the remainder 19 suffered skin injury and several exposures were comparatively minor. The bulk of the injuries occurred in research activities where unknowns involved in any research are usually accompanied by more accidents. In most instances the causes of the radiation accidents have been found to involve human and mechanical causative factors practically identical in type with those for accidents in which no radioactive consideration was involved. It can be concluded that the radiation hazard in industry can be controlled, and that while costs for radiation safety may be high in order to control accidents and injuries, these costs should be considered part of the operating expense.

792 Radium Capsules and Their Associated Hazards. R. G. Gallaghar and E. L. Saenger. Am. J. Roentgenol. Radium Therapy 77, 511-523 (Mar. 1957).

In the past several years there have been at least six accidents involving the escape of radium salts from their sealed containers. Potential health hazards have been created. Radium has been widely spread throughout buildings resulting in several occurrences of serious contamination and tedious decontamination procedures. The authors have had experience in two such episodes. Simple tests for leakage of sealed radium sources are described. Methods of handling radium accidents of this type are outlined. The necessity for adequate records of radiation surveys and decontamination operations is indicated. Practical techniques of handling contaminated individuals, contaminated areas and equipment, and decontamination techniques are detailed. Using proper procedures in such situations, the risk to the health of individuals can be reduced significantly. -- Authors' summary

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793 Pulmonary Effects from Radioactive Thallium-Activated Clay Particles. H. Cember, J. A. Watson, and T. B. Grucci. Arch. Ind. Health 15, 449, 450 (May 1957).

In experiments designed to study the biological effects on the lungs due to point sources of radiation located within the pulmonary parenchyma, the solubility of the radioactive particle in the pleural fluids introduces a complicating factor. A stable and practically insoluble source of radiation was produced by adsorbing thallium-204 on montmorillonite clay and heating to 1000°C. Rats were intratracheally insufflated with an isotonic saline suspension of this preparation with a narrow size distribution over a number of months. Histologic examination of the tissue sections showed no damage that could be attributed to radiation. There was no difference between the control group and the exposed group. The distribution of the dose according to distance from the discrete particle is calculated. In this experiment, although the specific activity of the particles was low, it is significant that the chronic exposure in the immediate vicinity of the particle at a level about ten times greater than the maximum permissible daily dose rate produced no observable biologic damage.

794 A Clinical Study of Radiation Cataracts and the Relationship to Dose. G. R. Merriam and Elizabeth F. Focht. Am. J. Roentgenol. Radium Therapy 77, 759-783 (May 1957).

The dose of roentgen and gamma radiation to the lens has been measured for 100 cases with radiation cataracts and 73 cases which received radiation to the lens but did not develop cataracts. The probabilities of cataract for varied doses were calculated for single and divided treatments. The higher the dose for a given duration of treatment, the shorter is the time of appearance of the lens changes and the higher the incidence of progressive opacities. The lenses of children under one year of age are the most sensitive. The usual shielding methods are ample protection from roentgen rays of 100-140 kv. For higher voltages (200-250 kv.) 2 mm. of lead is usually sufficient. In the entire group of 100 radiation cataracts, it is estimated that by the use of current techniques the lens opacities could have been avoided in at least 80 cases. -- Cond. from authors' summary

795 Decontamination of Irradiated Uranium by a Fluoride Volatility Process. W. J. Mecham, R. C. Liimatainen, R. W. Kessie, and W. E. Seefeldt. Chem. Eng. Progr. 53, 72F-77F (Feb. 1957).

A series of six pilot plant runs has been made on 10 kg. lots of uranium to demonstrate the decontamination of irradiated uranium by a process based on distillation of uranium hexafluoride. A rough distillation followed by a purification distillation gave a decontamination factor of the order of 10^8 for the uranium hexafluoride product.
-- Editor's summary

796 Engineering Aspects of the Disposal of Radioactive Wastes from the Peacetime Applications of Nuclear Technology. J. A. Lieberman. Am. J. Public Health 47, 345-351 (Mar. 1957).

The importance of developing safe methods of disposal of radioactive wastes is discussed. Present and possible disposal methods are described. Gaseous and airborne particulate wastes are being handled by methods that are described and as yet do not constitute a serious problem. The engineering of systems for handling and disposal of solid wastes has been relatively simple. Burial of such wastes under known, controlled conditions, and, in specific instances, disposal of sea have successfully and safely handled the problem, but problems will arise with expansion of the industry. Incineration of combustible solid wastes has been practiced to a limited extent. In the case of liquid wastes, it is important to distinguish between high-volume, low-level and low-volume, high level, wastes. The latter type constitutes the bulk of the engineering problem. The following methods are discussed: fixation in inert media, special separation of specific isotopes, and direct discharge to selected geologic formations. Each method presents a number of engineering problems. Other aspects discussed include site selection, administrative control, and changing technology.

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ENVIRONMENTAL MEASUREMENTS

797 An Automatic and Instantaneous Method of Determining Carbon Monoxide in Blood. P. Giacomo, M. Guillot, and P. Jacquinot. Compt. rend. 243, 985-987 (1956). French.

Low or high carbon monoxide in blood can be determined on one drop of blood in a few seconds within ± 0.5% by projecting and registering the absorption spectra on a photographic film, and the maximum determined by a registering microphotometer. -- Chem. Absts.

798 The Determination of Mercury in Air. G. A. Sergeant, B. E. Dixon, and R. G. Lidzey. Analyst 82, 27-33 (Jan. 1957).

A method is described for the determination of all forms of mercury in air at concentrations in the neighborhood of 100 micrograms per cubic meter. Mercury vapor is adsorbed by iodized active carbon, and mercury-bearing dust is trapped in a mineral-wool filter. On heating in a specially constructed ignition tube, the mercury is transferred as vapor to a selenium sulfide test paper, giving a stain that is compared with a set of standards.

799 The Preparation and Assessment of Size-Graded Mineral Samples. J. Cartwright. Research Rept. No. 128, Safety in Mines Research Establishment, Portobello St., Sheffield, England. 59 pp. (Aug. 1956). 4s. 6d.

This is a long monograph of 6 chapters and 4 appendices describing methods used at the Safety in Mines Research Establishment for measuring the size of dust particles. It is less a critical review of available techniques than a description of a few selected ones, with practical comments on their manipulation. The first chapter deals with the separation of dust into size ranges by settlement, gravitational for particles over 2 microns and centrifugal below. A chapter on visual counting and sizing follows. Particles greater than 2 microns can be graded under the optical microscope, but the electron microscope is used for smaller particles. The third chapter deals with the preparation of samples for microscopy. In considering the preparation of results the importance is stressed of either showing original data or else giving confidence limits. The remainder of the report is an extensive mathematical and theoretical discussion of various methods of presentation of results showing errors that can arise in the use of each method. It includes discussion of the relationship of the Stokes and projected area diameters. -- Cond. from Bull. Hyg.

PREVENTIVE ENGINEERING

800 Cleaning of Industrial Effluents. J. M. Kane. Heat. Pip. Air Cond. 29, 166, 167 (Apr. 1957).

With continued efforts by industry toward optimum in-plant environment and good public relations, it appears to the author: (1) that the cleaning of industrial effluents from stacks will involve increasing application of industrial air cleaning equipment; (2) that the demand will be toward designs with the highest order of efficiency; (3) that recirculation of cleaned air to working space is practical for many of industry's problems; and (4) that recirculation will be used much more extensively in the near future. -- Author's summary

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801 Plating Room Tank Ventilation Equipment. F. W. Arndt. Reprinted from 43rd Annual Proceedings, American Electroplaters' Society. 9 pp. (1956).

A successful exhaust system for plating tanks is based on the proper rate of fume removal and the most economical mechanical system for handling the fumes. The economics of an exhaust system dictate that the proper selection of the hood is important. The most serious error is likely to be improper selection of materials of the components of the system. Initial cost of the equipment must be balanced with maintenance or replacement costs and operating costs before a good system can be determined. Suggestions are given for the design of hoods, ducts, fans, scrubbers, and stacks with discussion of various factors that affect their efficiency and cost. Recommended exhaust rates are given for open top process tanks for a number of degreasing, plating, pickling, cleaning, and other materials.

802 Fume Combustion for Metal Lithographing Ovens. R. J. Ruff. Products Finishing 21, 24-28, 31 (Oct. 1956).

Vaporized solvent released during baking of lithograph plates causes air pollution and heat loss problems. The fumes can be fully oxidized by a catalytic process. A number of totally different types of active surfaces can be used in the process. Metals of the platinum family are normally used. The equipment is described, and the performance characteristics of standard fume combustion systems recently installed on coating ovens are given. The effluent gases were reported free of color, objectionable odors, or eye irritants. Methods of heat recovery are discussed.

COMMUNITY AIR HYGIENE

803 Nitrogen Oxides, Combustion, and Engine Deposits. R. S. Spindt, C. L. Wolfe, and D. R. Stevens. J. Air Poll. Control Assn. 6, 127-133 (Nov. 1956).

The authors show that oxides of nitrogen formed during combustion play an important part in the formation of engine deposits. The discussion is primarily concerned with that subject. The results, however, are also of interest in the air pollution field. Data and charts show the effect of spark setting, motor load, and engine speed on the nitric oxide content of exhaust gases. The authors conclude that lean fuel mixtures produce appreciable nitric oxide (up to 0.4%) in the exhaust gases, depending upon the motor load. There appears to be little hope for a reduction in nitrogen oxides from changes in engine conditions, since optimum economical operation seems to be in the range of high nitrogen fixation.

804 Control of Fluorine and Hydrofluoric Acid Discharges. J. Stris. APCA News 5 3 (Apr. 1957).

In a plant making hydrofluoric acid from fluorspar, the problem of the escape of hydrofluoric acid and hydrofluosilicic acid from the purification process was encountered. It was solved by the construction of spray tower chambers which allowed cocurrent and countercurrent flow of the effluent gas to the water spray. The bottom of each chamber is open but submerged in water. The water not only acts as a seal but also allows the waste to be discharged in a liquid state and redissolves the silica gel formed in the tower. All parts of the apparatus in contact with the acid are now constructed of polyethylene. The process has proved entirely successful and no fluorides are detected in the atmosphere. Another possible source of discharge to the atmosphere was in the handling of the fluorspar. Dust collectors separated the coarse from the fine materials and unloaded considerable quantities of fines periodically. Now a totally enclosed system without dust collectors is used.

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MANAGEMENT ASPECTS

805 Financing Group Insurance Plans. H. Fox. Mgmt. Rec. (National Industrial Conference Board) 19, 114-117, 146 (Apr. 1957).

Present policies of 187 companies regarding insurance plans are compared with those reported in a similar survey in 1949. The most outstanding change is the trend to noncontributory plans. This trend is most noticeable in benefits for nonoccupational disability. Also of interest are the new coverages found in the current survey, including major medical insurance and extension of basic medical plans to retired employees. Statistical tables and graphs show the extent of contributions by the employee and the company. Another subject considered is the disposal of "retrospective rate adjustments" returned by the insurance companies. Numerous variations among companies in all these plans are discussed in detail.

806 Problem Drinking in Industry—Review of a Company Program. S. C. Franco. Ind. Med. & Surg. 26, 221-228 (May 1957).

A definite company policy is the first step toward a program for meeting the situation of problem drinking in industry. A well-defined policy should form the practical basis for administrative procedures to cover (1) early recognition, (2) rehabilitation, and (3) a consistent method for termination of employment when efforts to effect rehabilitation are unsuccessful. The second step in the program is the establishment of medical facilities for rehabilitation. Success or failure of a company program will depend largely upon the industrial physician's ability to locate and develop resources for treatment. From a practical point of view, the success of a company program will sharply reduce the need for termination measures. The ultimate goal of any company procedure is the prevention of the disability from chronic problem drinking. A well-conceived and directed program is a firm step in this direction. The good results of industrial programs actually in operation indicate that such efforts not only yield material rewards in salvaging the skill and experience of long service employees, but also contribute to an over-all improvement in employee relations. -- Cond. from author's summary

807 Nutrition Services Available to Industry. Florence F. Brener. Monthly Rev. N. Y. State Dept. Labor 35, 45-48 (Dec. 1956).

The popularity and advantage of in-plant feeding facilities were definitely established during World War II. In-plant feeding continues to increase since the trend is for the industrial worker to buy his lunch rather than bring it from home, and he can obtain it without leaving the plant area. Conveniences of in-plant feeding facilities are frequently used as a factor in recruiting labor and sometimes in settling labor disputes. Workers can become better acquainted by eating together, and friendliness may develop into better cooperation at work and production will be improved. Since industrial feeding usually operates on a non-profit basis, the cost of meals is lower than elsewhere. Thus in-plant feeding develops morale and improves understanding between employers and employees. It also improves the general health of the employees through furnishing them with good, attractive, nutritious meals. The provision of good meals may also improve the eating habits of the worker outside the plant, especially if reenforced by an effective educational program in nutrition. -- Cond. from author's conclusion

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ACCIDENTS AND PREVENTION

808 The Application of Biomechanics to Safety Engineering. D. M. Ross and T. F. Hatch. Natl. Safety News 75, (JASSE Section) 25-28 (May 1957).

Two factors that affect human safety are unsafe acts and excessive stress. The added risks due to stress cannot be completely offset through attempts to improve human behavior. Rather, minimizing the accident risk in such stressful man-machine situations involves a revision in the design of the work situation based upon a fundamental understanding of biomechanics; that is, of man's capabilities and limitation to deal with external stresses. A systematic description of man's biochemical characteristics is needed, but there has been little experimentation on the subject. Two recent investigations on the subject are reviewed. One such investigation conducted in the authors' laboratories has been reported (IHF Abst. 580, May 1957). The second was recently completed by Dr. W. T. Dempster at the University of Michigan. It deals with the mechanical forces which are operative when the body exerts a pushing or pulling force with the hands. The results are reviewed briefly. These studies are fundamental in nature but have clear implications for safety engineers. (1) They illustrate how the need can be met for the systematic analysis of man-machine relationships which will provide a basis for establishing safety design criteria. Such analysis must precede the actual design of machinery. (2) Given such systematic description of biomechanical characteristics, a sound basis is provided for the accumulation of data on large population groups. (3) By relating force output to body and task position, these studies in themselves suggest design and layout criteria for safe operation. Present day safety statistics give no clue to the relation of biomechanics to accident hazards. Suggestions are given for further study of the problem.

809 Planning for Safety. R. W. Mallick. Safety Maintenance 113, 15-18, 42, 43 (May 1957).

In planning or redesigning a plant, many elements must be considered from the standpoint of safety. The most important ones are: (1) the plant site; (2) entrances and exits; (3) aisles, stairs, elevators, floors, ramps, and obstructions; (4) arranging and guarding of equipment; (5) painting and lighting; (6) prevention of fire and explosion; (7) first aid facilities; (8) flow of material and housekeeping; and (9) handling and storage of materials. The discussion of each of these factors includes a number of helpful suggestions.

810 Accident Control through Motivation. H. K. Lambie. Natl. Safety News 75 (JASSE Section) 29-32 (May 1957).

A definition of motivation is suggested: "to get someone to want to want to". Hindrances to the success of motivation for safety include physical inability, lack of knowledge, and misunderstanding of instructions. Motivation is effective when objectives of the safety program are clear, definite, within the capabilities of the employees, simple, short range, and challenging to the individuals concerned. The factors motivating people are: (1) desire for acceptance, (2) desire for recognition, (3) desire for a challenge, and (4) desire for security and comfort. Safety promotional plans, such as safety awards, contests, housekeeping programs, safety suggestion systems, and safety committees, must be planned so that every employee feels that he has an active part in it and stands to gain personally from its success. Principles are outlined for the conductance of safety programs. When these programs provide satisfaction of the employees' basic human desires, each employee will want to want to control accidents.

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811 Internal Derangement of the Knee Joint in Miners. J. B. Atkins. Brit. J. Ind. Med. 14, 121-126 (Apr. 1957).

The problem of damage to the menisci of miners has been studied in a series of 100 men, drawn without selection from those undergoing treatment at a rehabilitation unit in South Wales in 1953. It is shown that these injuries are common and of considerable importance in the mining industry. They are predominantly of occupational origin. The consequences of injuries to menisci in terms of disability are described and their possible relationship with osteo-arthritis is discussed. The factors in mining which appear to contribute to the occurrence of these lesions have been studied. Kneeling in narrow seams is of itself by no means the only, or even the main, cause of them. Attention is drawn to the importance, as causal factors, of slipping and tripping both at the coal face, on underground roadways, and on the surface of mines. Finally, some suggestions are made as to means of reducing the numbers of these common injuries. -- Author's summary

812 American Safety Standard for Pulp and Paper Mills. ASA P1. 1-1956. American Standards Association, 70 East 45th St., New York 17, N. Y. 18 pp. (1957). $1.00.

This document outlines measures to protect employees and property during the journey of wood from freight car to finished pulp or paper. Protection for workers includes safety regulation for guards, protective clothing, floors and platforms, lockouts, and power trucks. Dust, fumes, and gases are to be controlled at the source wherever possible; otherwise respirators are to be provided. Other provisions involve methods of releasing wood from the woodpile, cutting, sawing, and other operations in reducing the wood to pulp. -- Cond. from Natl. Safety News

813 Flammable Solvents in the First-Aid Room. E. R. Wallace. Safety Maintenance 113, 53, 54 (May 1957).

There are many flammable solvents in use by the industrial nurse. Among these are acetone, naphtha, alcohol, acetic acid, ethyl ether, petroleum ether, and ethyl chloride. Flammable liquids are by definition readily volatilized, easily ignited, and form explosive mixtures with air. Sources of ignition include matches, cigarettes, the electrical and mechanical sparks, and last but not least, static sparks. Other problems in the handling of solvents include toxicity and dermatitis. The necessity of care in the use of these solvents is obvious.

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