Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL --- decisions and trends

AUGUST, 1954
(Vol. 18, No. 8)

INDUSTRIAL HYGIENE FOUNDATION
MELLON INSTITUTE
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INDUSTRIAL HYGIENE FOUNDATION

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.

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WALMER ON CIVIL DEFENSE COMMITTEE

Dr. C. Richard Walmer, Managing Director of Industrial Hygiene Foundation, has been made a member of the advisory committee to study the civil defense problem in Pittsburgh and Allegheny County and to aid in civil defense activities.

LANZA MADE PROFESSOR EMERITUS

Dr. Anthony J. Lanza, a Trustee of the Foundation and a pioneer in the field of industrial medicine, has been made professor emeritus of New York University--Bellevue Medical Center's Post-Graduate Medical School, from which he is retiring at the end of the academic year. A faculty member since 1947, he has served as professor and chairman of the department of industrial medicine and director of the Medical Center's Institute of Industrial Medicine. He will continue as consultant for the Institute.
Dr. Lanza has been active in the field of industrial medicine and hygiene since 1906 and has contributed much to its advancement while serving in important government and industrial posts.

NEW PERSONNEL

Miss Ethel Tolker has been added to the staff of the Foundation's toxicology laboratory as research assistant. One of her main duties will be the preparation of tissue specimens for microscopic examination. Miss Tolker is a graduate of the University of Maryland and was formerly associated with St. Joseph's Hospital in Pittsburgh.

CHEMICAL-TOXICOLOGICAL COMMITTEE APPOINTMENTS

Two new members appointed to the Chemical-Toxicological Committee are: N. V. Hendricks, Head of the Industrial Hygiene Section, Esso Laboratories, Standard Oil Development Company; and H. E. Stokinger, Chief Toxicologist, Division of Special Health Services, U. S. Public Health Service, Cincinnati.

NEW REPRINT AVAILABLE

Reprints are available upon request of a paper on "A New Apparatus for the Partitioning of Expired Air of Small Animals", by Paul E. Palm, Kenneth M. Cook, Jack H. U. Brown, and Theodore Hatch, published in the Review of Scientific Instruments, Vol. 25, No. 6, 576-579, June, 1954.

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THRESHOLD LIMIT VALUES FOR 1954[1]

Adopted at the Sixteenth Annual Meeting of the American Conference of Governmental Industrial Hygienists, Chicago, April 24-27, 1954

Values are given in the following tabulation for the maximum average atmospheric concentration of contaminants to which workers may be exposed for an eight-hour work day without injury to health.

These values are based on the best available information from industrial experience from experimental studies, and, when possible, from a combination of the two. They are not fixed values but are reviewed annually by the Committee on Threshold Limits for changes, revisions, or additions as further information becomes available. Threshold limits should be used as guides in the control of health hazards and should not be regarded as fine lines between safe and dangerous concentrations. They represent conditions only within which it is felt that workers may be repeatedly exposed, day after day, without health being adversely affected. It is felt, at the present time, that workers should not be exposed to a working environment containing any of these substances in excess of the value indicated.

These values are not intended for use, or for modification for use, in the evaluation or control of community air pollution or air pollution nuisances.

Established Values[2]

Gases and Vapors

Substance	PPM	Substance	PPM
Acetaldehyde	200	Arsine	0.05
Acetic acid	10	Benzene (benzol)	35
Acetic anhydride	5	Bromine	1
Acetone	1000	Butadiene (1, 3-butadiene)	1000
Acrolein	0.5	Butanone (methyl ethyl ketone)	250
Acrylonitrile	20	Butyl acetate (n-butyl acetate)	200
Ammonia	100	Butyl alcohol (n-butanol)	100
Amyl acetate	200	Butyl cellosolve (2-butoxyethanol)	200
Amyl alcohol (isoamyl alcohol)	100	Carbon dioxide	5000
Aniline	5	Carbon disulfide	20

1. Copied from A.M.A. Archives of Industrial Hygiene and Occupational Medicine, June, 1954.

2. No compounds have been added to the established list. An innovation, however, is the inclusion of tentative values for about 40 additional substances. Changes in the established values have been made for three substances. They are indicated by an asterisk (*).

Gases and Vapors (cont.)

Substance	PPM
Carbon monoxide	100
Carbon tetrachloride	25
Cellosolve (2-ethoxyethanol)	200
Cellosolve acetate (hydroxyethyl acetate)	100
Chlorine	1
Chlorobenzene (monochlorobenzene)	75
Chloroform (trichloromethane)	100
1-Chloro-1-nitropropane	20
Chloroprene (2-chlorobutadiene)	25
Cresol (all isomers)	5
Cyclohexane	400
Cyclohexanol	100
Cyclohexanone	100
Cyclohexene	400
Cyclopropane	400
o-Dichlorobenzene	50
Dichlorodifluoromethane	1000
1,1-Dichloroethane	100
1,2-Dichloroethylene	200
Dichloroethyl ether	15
Dichloromonofluoromethane	1000
1,1-Dichloro-1-nitroethane	10
Dichlorotetrafluoroethane	1000
Diethylamine	25
Dimethylaniline (N-dimethylaniline)	5
Dimethylsulfate	1
Dioxan (diethylene dioxide)	100
Ethyl acetate	400
Ethyl alcohol (ethanol)	1000
Ethylamine	25
Ethyl benzene	200
Ethyl bromide	200
Ethyl chloride	1000
Ethyl ether	400
Ethyl formate	100
Ethyl silicate	100
Ethylene chlorohydrin	5
Ethylene dibromide (1,2-dibromoethane)	25
Ethylene dichloride (1,2-dichloroethane)	100
Ethylene oxide	100
Fluorine	0.1
Fluorotrichloromethane	1000
Formaldehyde	5
Gasoline	500
Heptane (n-heptane)	500
Hexane (n-hexane)	500
Hexanone (methyl butyl ketone)	100
Hexone (methyl isobutyl ketone)	100
Hydrogen chloride	5
Hydrogen cyanide	10
Hydrogen fluoride	3
Hydrogen selenide	0.05
Hydrogen sulfide	20
Iodine	1
Isophorone	25
Mesityl oxide	50
Methyl acetate	200
Methyl alcohol (methanol)	200
Methyl bromide	20
Methyl cellosolve (methoxyethanol)	25
Methyl cellosolve acetate (ethylene glycol monomethyl ether acetate)	25
Methyl chloride	100
Methylal (dimethoxymethane)	1000
Methyl chloroform (1,1,1-trichloroethane)	500
Methylcyclohexane	500
Methylcyclohexanol	100
Methylcyclohexanone	100
Methyl formate	100
Methylene chloride (dichloromethane)	500
Naphtha (coal tar)	200
Naphtha (petroleum)	500
Nickel carbonyl*	0.001
Nitrobenzene	1
Nitroethane	100
Nitrogen dioxide*	5
Nitroglycerin	0.5
Nitromethane	100
2-Nitropropane	50
Nitrotoluene	5
Octane	500

Gases and Vapors (cont.)

Substance	PPM	Substance	PPM
Ozone*	0.1	Stibine	0.1
Pentane	1000	Stoddard solvent	500
Pentanone (methyl propyl ketone)	200	Styrene monomer (phenyl ethylene)	200
Perchlorethylene (tetrachloro-ethylene)	200	Sulfur monochloride	1
Phenol	5	Sulfur dioxide	10
Phosgene (carbonyl chloride)	1	1,1,2,2-Tetrachloroethane	5
Phosphine	0.05	Toluene	200
Phosphorus trichloride	0.5	o-Toluidine	5
Propyl acetate	200	Trichloroethylene	200
Propyl alcohol (isopropyl alcohol)	400	Turpentine	100
Propyl ether (isopropyl ether)	500	Vinyl chloride (chloroethene)	500
Propylene dichloride (1,2-dichloro-propane)	75	Xylene	200

Toxic Dusts, Fumes, and Mists

Substance	Mg. per cu.m.	Substance	Mg. per cu.m.
Antimony	0.5	Pentachloronaphthalene	0.5
Arsenic	0.5	Pentachlorophenol	0.5
Barium (soluble compounds)	0.5	Phosphorus (yellow)	0.1
Cadium	0.1	Phosphorus pentachloride	1
Chlorodiphenyl	1	Phosphorus pentasulfide	1
Chromic acid and Chromates as CrO_3	0.1	Selenium compounds (as Se)	0.1
Cyanide as CN	5	Sulfuric acid	1
Dinitrotoluene	1.5	Tellurium	0.1
Dinitro-o-cresol	0.2	Tetryl (2,4,6-trinitrophenyl-methylnitramine)	1.5
Fluoride	2.5	Trichloronaphthalene	5
Iron oxide fume	15	Trinitrotoluene	1.5
Lead	0.15	Uranium (soluble compounds)	0.05
Magnesium oxide fume	15	Uranium (insoluble compounds)	0.25
Manganese	6	Zinc oxide fumes	15
Mercury	0.1		
Parathion (O,O-Diethyl-O-p-nitrophenyl thiophosphate)	0.1		

Mineral Dusts

Substance	MPPCF	Substance	MPPCF
Alundum (aluminum oxide)	50	Silica	
Asbestos	5	high (above 50% free SiO_2)	5
Carborundum (silicon carbide)	50	medium (5 to 50% free SiO_2)	20
Cement	50	low (below 5% free SiO_2)	50
Dust (nuisance, no free silica)	50	Slate (below 5% free SiO_2)	50
Mica (below 5% free silica)	20	Soapstone (below 5% free SiO_2)	20
Talc	20	Total dust (below 5% free SiO_2)	50

Tentative Threshold Limit Values

Allyl alcohol (ppm)	5
Allyl propyl disulfide (ppm)	2
Benzyl chloride (ppm)	1
Diacetone alcohol (4-hydroxy-4-methyl pentanone-2) (ppm)	50
Diisobutyl ketone (ppm)	50
Furfural (ppm)	5
Mercaptans (ppm)	
Methyl mercaptan	50
Ethyl mercaptan	250
Butyl mercaptan	10
Perchlormethyl mercaptan	0.1
Methyl isobutyl carbinol (methyl amyl alcohol) (ppm)	25
p-Nitroaniline (ppm)	1
Pesticides (mg per cu.m.^{3})	
Organic Phosphates	
Parathion (O,O-diethyl O-p-nitrophenyl thiophosphate)	0.1
TEPP (tetraethyl pyrophosphate)	0.05
TEDP (tetraethyl dithiono pyrophosphate)	0.2
EPN (ethyl-p-nitrophenyl thiono benzene phosphonate)	0.5
Malathon (O,O-dimethyl dithio phosphate of diethyl mercaptosuccinate)	15.0
Chlorinated Hydrocarbons	
Lindane (hexachlorocyclohexane)	0.5
DDT (2,2-bis-(p-chlorophenyl)-1,1,1-trichlorethane)	2.0
Chlordane (1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindane)	2.0
Aldrin (1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene)	0.25
Dieldrin (1,2,3,4,10,10-hexachloro-6,7, epoxy-1,4,4a, 5,6,7,8,8a-octahydro-1,4,5,8-dimethanonaphthalene)	0.25
Methoxychlor (2.2, diparamethoxyphenyl-1,1,1,trichloroethane)	15

Tentative Threshold Limit Values (cont.)

Inorganic Compounds	
Calcium arsenate	0.3
Lead arsenate	0.2
Organo mercurials (as mercury)	0.01
Organic Herbicides	
2, 4-D(2, 4-dichlorophenoxyacetic acid)	10
Ammate (ammonium amidosulfate)	15
Crag Herbicide (sodium-2, 4, dichlorophenoxy ethyl sulfate)	15
Phenylhydrazine (ppm)	5
Picric acid (mg. per cu. m.)	0.1
Pyridine (ppm)	10
Sodium hydroxide (mg. per cu. m.)	2
Sulfur hexafluoride (ppm)	1000
Sulfur pentafluoride (ppm)	0.025
Titanium dioxide (mg. per cu.m.)	15
Vanadium (mg. per cu.m.)	
(V_2O_5 dust)	0.5
(V_2O_5 fume)	0.1
Ferro vanadium dust	1

Reference material has been prepared on each of the above substances and, though in some instances rather meager, is available for distribution. The committee would welcome suggestions of substances to be added and also comments, additional references, or reports of experience with these materials.

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Industrial Hygiene Foundation
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INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

830 General Electric Industrial Clinic.

On July 9 the General Electric Company opened its new million-dollar industrial clinic at Schenectady, New York, with appropriate ceremonies. The 2 1/2 story brick and concrete clinic will serve primarily as a center for emergency treatment for injured or seriously ill employees, as a laboratory to study industrial hygiene and working conditions, and as a center for pre-employment physical examinations. The facility will have no permanent beds. Cases involving serious injury or illness will be given emergency treatment and transferred to hospitals. In addition to rooms and equipment for therapy and examination, other features include an emergency power service, an alarm system, air conditioning, a public address system for paging, and a tele-voice writer system. Automatic sprinklers have been installed in areas where flammable material is stored. The Clinic will enable the Company to give the best possible industrial medical service to its employees.

831 Lowest Accident Rate in History is Set by the Chemical Industry.

If you want to be safe, get a job in a chemical plant. You'll be in less danger of injury there than in driving an automobile, working about the home, or walking on the street. This fact is established in a report recently issued by the Manufacturing Chemists' Association. Some 174 plants of 22 chemical companies operated through 1953 without a single lost-time accident. Member companies participating in the 1953 program established a new low accident frequency of 3.69 per million man-hours worked, making the chemical industry one of the safest in the nation. The rate has been gradually reduced from 7.65 in 1946. The rate for the first quarter of 1954 is 3.02. MCA Certificates of Achievement will be presented to the 22 winning companies at the coming 82nd Annual Meeting of the Association. The Lammot du Pont Safety Plaque Awards, given annually to the two companies showing the greatest improvement in plant safety over a five-year period, will also be presented at the convention.

-- News release, Manufacturing Chemists' Assn.

832 Law against Flammable Fabrics.

The federal "Flammable Fabrics Act" went into effect July 1. It is designed to prevent the sale of wearing apparel "so highly flammable as to be dangerous when worn by individuals." The intent is simple but many complications arise in practice. Among them is the question of suitable testing. The organization of the textile business, with tens of thousands of small producers, raises many other questions. The situation is discussed in Business Week for June 26 (p. 108).

833 Source of "Worm-Like Strings Falling from Sky" Determined.

More than a year ago complaints of yellow, string-like deposits on automobiles were received from Chehalis, Washington. Similar complaints came from various sources more recently. These "brown strings" adhere tenaciously to the car finish. They range from yellow to brown, and are sweet smelling and tasting. Microscopic studies showed the material to be composed of pollen and other partly digested material which appeared to be the excrement of an insect. A check on the location of the complaints showed that they centered around areas where bees were kept. A check on bees' habits showed that adult worker bees feed in the winter on honey stored in the hive and eject the matter outside the hive. This condition is also found with one of the bee diseases.

-- Cond. from Occ. Health Newsletter (Seattle, Wash.)

834 Occupational Medicine in Austria.

An Austrian Society for Occupational Medicine (Osterreichische Gasellschaft fur Arbeitsmedizin) was founded in Vienna on April 4, 1954. At the first meeting many physicians and engineers, and delegates of employers', workers', and social insurance organizations, were present.

Ind. Med. & Surg.

835 British Occupational Hygiene Society.

The British Occupational Hygiene Society held its second conference April 6, 1954, at the London School of Hygiene and Tropical Medicine. The conference was devoted to the discussion of "Upper Allowable Concentrations."

Ind. Med. & Surg.

OCCUPATIONAL DISEASE STATISTICS

836 Occupational Disease Statistics.

	Ind.[1] July 1954	Wis.[1] June 1954	Total
Allergy		1	1
Dermatitis	7*	29	36
Eye irritation		2	2
Lung irritation		1	1
Paint--nausea		1	1
Silicosis		1	1
Silico-tuberculosis	1		1
Skin infection		7	7
Skin irritation		7	7
Tuberculosis		1	1
Upper respiratory irritation		2	2
Zinc fever		1	1
	8	53	61

1. Occupational disease cases reported to the State Board of Health.

* Core oil, electric tape, lacquer thinner, oak wood, and rubber caused one each; and the cause of two others was not stated.

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LEGAL DEVELOPMENTS

837 Occupational Diseases--Aggravation--Ice Company Employee--Arteriosclerotic Peripheral Vascular Disease of the Feet.

The claimant, an ice company employee who suffered from a pre-existing nonoccupational arteriosclerotic peripheral vascular disease of the feet, was properly awarded compensation for total disability where there was evidence that his condition was aggravated by the nature of his employment. It was not necessary that his pre-existing disease be the common, expected and inherent result of the work. It was only necessary that an examination of the end result of his exposure reveal that the occupation itself caused the aggravation resulting in disablement, and since it did, the pre-existing disease was "occupational" even though "the employee brought within himself a predisposition to the disablement shared by no employee of his class." In this case the aggravation was the occupational disease. Affirmed. Griffen v. Webster. New York Supreme Court, Appellate Division, Third Judicial Department, No. 334-2. December 22, 1953. -- CCH

838 Foundry Moulder--Silicosis--Tuberculosis--Aggravation--Burden of Proof.

The claimant, a foundry moulder, was properly awarded compensation when he was injuriously exposed to silica dust resulting in a partial permanent disability of 50%. A pre-existing tubercular condition was aggravated by the silicosis to the extent of 5%. The evidence disclosed that the sand used in the foundry was carried on conveyors which caused dust to be spilled in the face of claimant. The chipping and grinding of fire brick also exposed him to great quantitites of dust and at times the dust was so thick that it was difficult to see from one wall to another. Tests were made by the foundry management which showed that the silica dust present in the foundry was less than harmful quantities. However, the court found nothing in the record to show that the conditions at the time of the test were the same as at the time of claimant's employment. Affirmed. Texas Employers' Insurance Ass'n. v. Etheredge. Texas Court of Civil Appeals, Fifth District. No. 14,752. December 18, 1953. -- CCH

839 Dermatitis--Proof of Employer's Negligence--Sufficiency of Evidence.

In reversing a judgment for $2,080 in favor of a factory worker who contracted dermatitis, the reviewing court held that knowledge of the peril was fundamental to responsibility on the part of the employer, and that the preponderance of

evidence showed that the cleaning liquid which she alleged was the cause of her dermatitis did not result in injury under normal use. Paducah Battery Co. v. Edgar. Kentucky Court of Appeals. February 26, 1954. -- CCH

840 Silicosis--Coal Miner--Failure to Accept Coverage of Compensation Act--No Subsequent Exposure.

An employee who contracted silicosis while in the employ of the defendant coal company was not entitled to compensation where he had not elected to be covered by the silicosis section of the compensation act until after the silicosis had been contracted. The employer had elected to come under the act in March, 1951. The employee ceased work in August, 1951, and, on October 29, 1951, he agreed to accept the silicosis section of the act. The employee claimed that he made his election in April, 1951. The court ruled that the evidence showed that the employee had not signed the compensation register until October, 1951, and, since he was not exposed to the hazards of silicosis after that time, that there could be no recovery. The court further stated that acceptance of the compensation act after injury could not have a retroactive effect to authorize recovery of compensation. Fuston v. Consolidated Coal Co. Kentucky Court of Appeals. March 12, 1954. -- CCH

841 Miner--Silicosis--Pulmonary Tuberculosis--Injurious Exposure--Liability for Compensation.

A miner who had been employed for at least thirty working days in the seven-month period prior to his disablement was properly awarded compensation of $18 per week for 400 weeks for the disability resulting from silicosis where the findings of fact made by the commission were sufficient to support the award. The employer's insurance carrier at the time of the last injurious exposure was solely liable for the compensation despite the fact that the carrier had been assigned the risk only a short time before the disablement and despite the fact that the employee had worked after it was known that he had silicosis. The court ruled that there could be no comparative responsibility as between successive carriers since the statute called for liability to rest on the carrier at the time of the last injurious exposure, and that the employment in the mine after the discovery of the condition of silicosis in the employee was not in bad faith. It was also held that the refusal to reduce the award as a result of the finding that the employee was also suffering from pulmonary tuberculosis was within the discretion of the commission and the award was affirmed. Stewart v. Duncan. North Carolina Supreme Court. March 17, 1954. -- CCH

842 Occupational Disease--Grain Elevator Houseman--Exposure to Grain Dust.

A grain elevator employee, was properly awarded compensation for partial disability which resulted in reduced earnings where the evidence supported the finding of the commission that he became disabled by reason of bronchial

asthma and emphysema resulting from an over-exposure to grain dust. The commission ruled this to be an occupational disease due to the nature of his work, and contracted in the course of his employment with the same employer. The board's determination of the date of disability and its causal connection with the claimant's employment was sufficiently supported by the evidence. Affirmed. Miller v. International Milling Co. New York Supreme Court, Appellate Division, Third Judicial Department. No. 160-4. June 18, 1954. --CCH

843 Silicosis--Statutes Construed--Change of Occupation to Avoid Further Exposure.

A foundry worker was properly granted a writ of mandamus against the commission requiring it to grant an award for a change of occupation due to his contracting silicosis despite the fact that he did not comply strictly with the statute which provided that the claimant must remain at the same work until authorized by the commission to change his occupation. The court ruled that, if the statute were construed as the commission claims it should be, the result would be that the claimant afflicted with silicosis would be compelled to remain in a job which would aggravate his distressed condition and subject him to inhuman punishment. The court ruled that this was not the intention of the legislative body enacting the statute. Affirmed. State of Ohio ex. rel. Nemeth v. Industrial Commission. Supreme Court of Ohio. No. 33,630. March 17, 1954. -- CCH

BOOKS, PAMPHLETS AND NOTICES

844 Physician in the Courtroom. L. Adelson, C. DeWitt, S. R. Gerber, and A. R. Moritz. O. Schroeder, editor. The Press of Western Reserve University, 11133 Bellflower Road, Cleveland 6, Ohio. 99 pp. (1954) $2.00.

Each of the authors has contributed a chapter. "Injury and Cancer" is discussed by Adelson. Certain cancers are definitely related to industrial exposure; on the other hand, as the author points out in his summary, experimental evidence to support the theory that a single trauma can cause a tumor is completely lacking, and the award of compensation solely on the basis of the appearance of a tumor following a single trauma is therefore unjustifiable. The award of compensation or damages on the basis that cancer acted as a collateral or adjuvant agent is probably justifiable when it is proved that chronic inflammation or irritation resulted from the injury and the presence of the tumor is proved.

"Medical Ethics and the Law: The Conclict between Dual Allegiances" is the title of the chapter by DeWitt. The physician's ethical duty of secrecy is not absolute. The Hippocratic Oath does not transcend the legal duty of testifying as a witness. The physician's duty in matters relating to public health and to crime are discussed at length, both in regard to court testimony and disclosures outside the courtroom. The responsibility in slander and defamation suits is considered. Many fine distinctions in the physician's duty are raised.

In the chapter on "Expert Medical Testimony and the Medical Expert," Gerber discussed the physician's rights and responsibilities in presenting testimony, including the subjects of competency, pre-trial conference, hypothetical questions, and the use of text books and records. A list of rules of conduct is presented, among which are: be scrupulously honest in testimony; do not talk too much; do not answer hostile questions too quickly; do not use technical terms unnecessarily; and do not try the case. Dress, appearance, dignity, confidence, and humility are important factors.

In "Trauma and Heart Disease," by Moritz, nine possible relations of injury to heart disease are discussed, varying from trauma resulting in direct injury to the heart to trauma preceding heart disease or heart failure and not causally related to either. In the other cases discussed the trauma may lead to aggravation of pre-existing disease or may be an indirect cause. -- FFR

845 Sectional Radiography of the Chest. I. J. Kane. Springer Publishing Co., Inc. 44 East 23rd Street, New York 10, N. Y. 154 pp. (1953) $7.50.

Sectional radiography as a means of bloodless dissection yields information obtained by no other procedure. Its most extensive application has been to diseases of the chest, where the limitation of conventional radiography are most apparent. These limitations are based on the fact that essential information is often lost in the superimposed shadows of rib, soft tissues, vascular structures, and complex disease processes. By separating these shadows, sectional radiography affords a picture which resembles only those seen by the pathologist. There have been three needless deterrents to the wider application of this procedure: (1) poor understanding of the intervals at which the pictures should be obtained; (2) improper choice of x-ray exposures; and (3) consideration of time and expense involved in thorough studies of this nature. The first section of this book describes principles and methods and gives specific directions for application of the method to examinations of various areas and to the diagnosis of particular pathological conditions. In the remainder of the volume, numerous cases are presented and illustrated, from which the author concludes that undue concern with the factors of time and expense often constitutes false economy. The exposure hazards, as in other forms of radiography, can be avoided by measurements of radiation and suitable control. Chest planigraphy can be shown to be less dangerous than fluoroscopy. -- FFR

846 Handbook of Cardiology for Nurses. W. Modell and Doris R. Schwartz. Springer Publishing Co., 44 East 23rd Street, New York 10, N. Y. 320 pp. (1954) $4.25.

This book is written specifically for nurses, to acquaint them with cardiology and cardiac therapy. The early sections of the book explain heart disease, its symptoms and course. The first edition written by Dr. Modell, has been extensively revised, and five additional chapters deal with the patient and his total nursing care, from the hospital to the home, and from nursing the acutely ill to the situations that arise from chronic heart disease for the patient, his family, and the community. -- FFR

847 Guide for Safety in the Chemical Laboratory. General Safety Committee of the Manufacturing Chemists' Association, Inc. 250 Fourth Avenue, New York 3, N. Y. 234 pp. (1954) $4.25.

This book covers the entire field of safety in the laboratory, including; general rules for the design and construction of a safe and efficient laboratory; necessary equipment and service facilities; precautionary methods and personal protective equipment; the hazards presented by certain physical properties of materials which possess fire, explosion, and health hazards, including precautions and safeguards; first aid and suggested medical treatment of injuries resulting from exposure to chemicals; and reference to sources of safety information. The chapter on falmmability includes a table giving flash points, ignition temperatures, explosive limits, and other data for nearly 700 chemicals. In the chapter on toxicity the threshold limits values are listed. Radiation safety and contamination control is the subject of a chapter. -- FFR

INDUSTRIAL MEDICAL PRACTICE

845 Medical Research Program in Industry. R. E. Eckardt. Am. Ind. Hyg. Assn. Quart. 15, 124-126 (June 1954).

The organization of the medical research division of Standard Oil Development Company is described. The steps taken in the evaluation of possible hazards of a new chemical are outlined, and a number of the questions that arise are discussed. The motto of the Division is that no chemical is too toxic to be used, provided it is understood how to use it safely.

849 Environmental Medicine in Industry. C. R. Walmer. Public Health Repts. 69, 585-587 (June 1954). Reprints are available from the Foundation.

Environmental medicine in industry may be defined as a specialized form of medical and legal health practice which combines with medicine the sciences of engineering, chemistry, toxicology, psychiatry, sociology, statistics, and health promotion. It has as its objective the improvement of physical and mental efficiency of the worker through the application of these sciences to both the worker and his industrial environment. The results should be measured in increased production and better products. The author broadly discusses environmental medicine in relation to its functions and goals as thus defined. The physical examination as an important part of the physician's duties is discussed. Research is an essential part of environmental medicine. As a result of research and other activities, environmental medicine will progress to the point where the medical department will be recognized as a positive part of the industrial organization. Environmental medicine will be utilized in the smaller plants. The need for education in industrial medicine on the postgraduate level is stressed.

850 Founders' Day Program. Health Assurance Forum. Women's Medical College of Pennsylvania, Henry Avenue and Abbottsford Road, Philadelphia 29, Penna. 79 pp. (Mar. 11, 1954).

The program of this Forum consisted largely of papers on preventive medicine. Three panel discussions are titled respectively, "Preventive Medicine and Industry", "Going Back to Work", and "Health Maintenance for Enhancing Labor-Management Accord." Among the subjects discussed by well-known authorities were: environmental influences, mental hazards, absenteeism, health service needs of large and small industries, retirement, contributions of labor and management to health maintenance, and keeping our bodies as fit as our machines.

851 The Occupational Medical Foundation, Institute of Occupational Health. Annual Report, 1953. L. Noro. Helsinki, Finland. 43 pp. (1954).

The organization and functions of the Institute are described and progress in 1953 is reported. It comprises five departments: general, medical, physiological, psychological, and industrial hygiene. Among the functions of the Institute are: (1) examination and development of methods of occupational hygiene; (2) plant surveys and other examinations; (3) assistance to governmental authorities and institutions; (4) conference with physicians, trade union officials, and others on occupational health; (5) functioning as a diagnostic and clinical center for occupational diseases; (6) dissemination of occupational health information and instruction. Progress in each of these fields is reported. A list of 130 original papers, reviews, books, and reports by members of the staff is given, and many of them are abstracted.

852 Annual Report, 1953, Department of Industrial Health, Tata Industries, Ltd. H. P. Dastur. 17 pp. (1954).

Progress of the Department for 1953 is reported under the headings of medical aid, research, safety engineering, personnel management, social activities, and extra-curricular activities. Medical aid includes not only occupational diseases, but also attention to non-occupational diseases revealed by placement examinations. Statistics of attendance at factory clinics and analysis of defects found in medical examinations are tabulated. Fields of research include: maladjustment on work on production; entomological survey; hyssinosis; insecticides; survey of accidents by time of occurence; seasonal occurrence of accidents; accidents and defective vision; and weight and height of creche children. Industrial hygiene surveys, preventive maintenance, and fire and accident prevention are features of the safety engineering program. Induction of new recruits is now an accepted managerial policy, and group discussions and the conference method are gaining in popularity.

853 Engineering and Industrial Hygiene. Philip Drinker. Brit. Med. J. 1, 1337-1340 (June 12, 1954).

Current methods of industrial insurance in the United States are described, and the value of the insurance companies' inspection schemes is stressed. The origin and development of industrial hygiene services in the United States are recounted. The role of the industrial hygienist in establishing a safe working environment is emphasized, and threshold limits for toxic substances, adopted by the American Conference of Industrial Hygienists in 1953, are listed. The control of noise in industry is given brief mention. -- Author's summary

854 Industrial Medicine--and Disaster. Symposium. Ind. Med. & Surg. 23, 321-325 (July 1954).

Atomic Bomb Preparedness is discussed by A. F. Lecklider. The activities of the Civil Defense Plan of the Detroit area in organization for dealing with possible atomic bomb disaster are described. G. A. Eadie relates the history of the disastrous fire at the General Motors plant at Livonia, Michigan, August 12, 1953. The mortality and morbidity from the fire were phenomenally low because of the efficient work of the company's medical department and other employees and the local Civilian Defense organization. Similarly the effects of the tornado at Waco, Texas, May 11, 1953 were minimized by efficient emergency organization, as described birefly by H. Jaworski. Army personnel and the Red Cross are given credit for valuable assistance.

855 Industrial Sanitation--A specialized aspect of Environmental Sanitation. A. F. Meyer. Modern Sanit. 6, 51-54 (June 1954).

No entirely satisfactory definition of industrial sanitation has been

formulated as yet. A suggested definition is "the application of scientific principles to the industrial environment in the interest of improving the state of health of workers or others affected by industrial operations." This broad definition includes the entire field of industrial hygiene. In fact, sanitation and industrial hygiene are very closely related. However, the industrial hygienist may have only minor interest in plant water supply, insect and rodent control, and general plant cleaning. The sanitary engineer or sanitarian engaged in general environmental health work, on the other hand, is not concerned with occupational hazards. Management may feel that industrial sanitation is merely a matter of cleaning floors and plant area, without regard to waste disposal problems. In some large companies, however, sanitation is a definite part of the function of industrial hygiene. The shortage of workers in official health agencies has led to increased consciousness of sanitation on the part of management, and the trend is toward self-policing. Although it is difficult to define industrial sanitation, it is possible to outline the many areas of activity pertaining to its practice. They are summarized in a table, under the broad headings of: (1) initial planning of plant or work procedure; (2) environmental surveillance and control; and (3) production support. The degree of success of industrial sanitation programs depends upon management support and cooperation.

856 Serial Chest Roentgenograms: An Evaluation. Katharine R. Boucot and M. J. Sokoloff. Diseases of Chest. 26, 70-80 (July 1954).

Annual chest roentgenograms yield sufficient abnormalities to make them worth while. Like all survey films, they are only as good as their interpretations and subsequent follow-up. Serial films can be much more accurate than single films if the interpreters take the time to compare previously available photofluorograms. Serious errors can be compounded if readers are casual about classifying lesions. Tuberculosis found following the existence of previously negative photofluorograms is of greater import than that found in routine first screening for prevalence. Serial films provide an opportunity to return to clinical supervision those who have strayed and whose new films reveal progressive disease. Even with elaborate study, a few undiagnosed cases remain.

-- Cond. from authors' summary

857 The Clinical Value of X-Ray Image Intensification. G. M. Ardran. Trans. Assn. Ind. Med. Officers. 3, 324 (Jan. 1954).

Methods of x-ray image intensification for fluoroscopy and photography are discussed. Intensification screens of fluorescent material decrease the definition of the image. Electronic means for intensification are now used in fluoroscopy. With the intensification it is not necessary to view the image in a darkened room; cone vision can be employed and definition can be brought closer to that of a conventional film. On the other hand the radiation dose to the patient can be reduced only to 10 to 20% of the usual dose, on account of statistical fluctuation of incident quanta. For cine-radiography, however, the dose can be

reduced to 2.5% of that required for a simple fluorescent screen. Within the restrictions outlined, image intensifiers will be used for fluoroscopy. Photography of the intensified film may be used where maxiumum definition is not required and where economy is important.

858 Tuberculosis in Industry. P. Landry. Occ. Health Rev. (Canada) 5, 13-16 (Mar. 1954).

In order to achieve control of tuberculosis in industry, the following requirements should be met: (1) a serious pre-placement examination, taking into account the personal and family history of the candidate, and including a skin test and chest x-ray; (2) interpretation of any abnormal lung picture with due allowance for clinical and laboratory conclusions; (3) periodical chest x-ray, based on age, type of work, and tuberculin tests; (4) x-ray examination of any employee developing a pulmonary illness while at work, before resuming his work; and (5) education of the employee's family and environment.

-- Cond. from author's summary

859 The Cardiac Can Work. S. C. Franco. Ind. Med. & Surg. 23, 315-320 (July 1954).

The author discusses the problem of heart disease in industry and reports the experience of Consolidated Edison Company in dealing with the problem. In a survey of the company's 24,473 employees, the incidence of heart disease was found to be 3.6%; those with even the slightest affliction were included in an earlier survey, which showed a rate of over 7%. Arteriosclerotic heart disease accounted for 58% of the cases, and hypertensive vascular disease, 23%. Rheumatic heart disease was present in almost all the remainder, but was frequently associated with the other forms. The physical restrictions considered in placing cardiacs are tabulated, and a number of factors in prognosis and evaluation of work capacity are discussed. Heart disease is rarely related to strain. In four of the seven compensation claims over the past seven years, causal relation of strain or injury was admitted, in fact first noted by the Medical Department. In the light of this record there is solid ground for the statement that an adequate medical service in industry can do much to reduce the liability factor in heart disease. A more reasonable attitude toward cardiac problems on the part of management, labor, and the community is urged.

860 The Stress Disorders and the Industrial Physician. W. P. Shepard. Public Health Repts. 69, 581-584 (June 1954).

The stress disorders are varied, often nebulous, and always important in industry, especially with executives. They are not always occupational in origin; work per se is not necessarily harmful. The stress disorders are the result of some maladjustment, and are easier to prevent than cure. Their

prevention and cure is one of the industrial physician's most important responsibilities. -- Cond. from author's conclusions

861 Alternating Positive-Negative Pressures in Mechanical Respiration. (The Cycling Valve Device Employing Air Pressure.) M. S. Segal, A. Salomon, and J. A. Herschfus. Diseases of Chest. 25, 640-648 (June 1954).

A simple portable air pressure device is described which safely produces positive and negative phase pressures (exsufflation with negative pressure) without disturbing the circulatory hemodynamics during the brief periods of therapeutic application. The pressure characteristics in the face mask obtained with this unit are recorded, during a single cough and during a series of coughs. The rapid expiratory air flows created are sufficiently capable of eliminating the accumulated pulmonary secretions in a variety of pulmonary and nonpulmonary diseases. This form of therapy is being applied in patients with bronchiectasis and similar conditions. A detailed case history is presented in a patient with a large atelactatic-cystic area of the lung. -- Cond. from authors' summary

862 Problem Drinking in Industry. T. H. Hogshead. Arch. Ind. Hyg. and Occ. Med. 9, 526-529 (June 1954).

The writer credits Alcoholics Anonymous with the recognition and treatment of problem drinking as a disease and with stimulating the public to accept it as such. Thus the way has been opened for a sensible approach to this disease in medicine, in the social sciences, and even in religion. The program of the Du Pont Company for the problem drinker, in all its phases, is built around the Alcoholics Anonymous fellowship. There are no groups within the company, but most plant locations have such facilities nearby. The company's medical facilities, as well as many community facilities are utilized fully in attacking the problem, but always with active association in A. A. as the immediate goal. Over a ten-year period an estimated 65% of the cases treated have been rehabilitated at a total cost of less than $100,000.

We export billions of dollars in merchandise and machinery. Why can't we export health? We have the know-how. We are the healthiest nation in the world. Our techniques in the fields of public health and industrial medicine are unequaled by any nation in the world. It is only logical that American physicians should take a leading role in the vital work being done by international bodies like the World Medical Association. -- Ind. Med. & Surg.

SKIN DISEASES AND BURNS

863 Dermatitis from Waterless Hand Cleaners. G. E. Morris. Arch. Ind. Hyg. & Occ. Med. 9, 507-508 (June 1954).

Nine cases of vesicular dermatitis of the hands are reported from the use of waterless hand cleaners, the cleansing ability of which is based primarily on the use of solvents. Such solvents are of the naphtha series and are potent irritants and sensitizers; therefore, they should not be used as hand cleaners.
-- Author's summary

864 Uses and Abuses of Antibiotics in the Treatment of Dermatoses. H. M. Robinson, Jr. U. S. Armed Forces Med. J. 5, 953-967 (July 1954).

Antibiotic therapy should only be used where there is a specific indication and the drugs should be administered in adequate dosage. Long continued systemic administration of any of the antibiotics is not considered good practice because rest periods are necessary to prevent the destruction of the natural flora of the skin. The ideal drug for local application is one which is not used for systemic administration. The use of the various antibiotics is discussed. -- Cond. from author's summary

865 Radiotherapy in Its Relation to Dermatology. B. W. Windeyer. Brit. Med. J. 1, 945-949 (Apr. 24, 1954).

The use of radiotherapy in the treatment of the various skin diseases, is discussed, under separate headings varying from simple inflammation and dermatoses to cancer. The three general methods of application--multiple small doses, single dose, and large doses--are considered in relation to the nature of the condition to be treated. Cooperation between the dermatologist and the radiotherapist is essential.

866 Fiberglas. Queries and Minor Notes, J. Am. Med. Assn. 155, 948 (July 3, 1954).

The question concerns hazards of inhaling fiberglas dust, including pneumoconiosis. Fiberglas dust does not produce any pneumoconiosis that is analogous to silicosis. On a mechanical basis, fiberglas spicules are irritating, especially to the skin. The plastics used to cement fiberglas, when present in

unpolymerized form, contribute to the irritation. Mechanical exhaustion of the air is desirable when the dust concentration is high, as is air conditioning in hot weather. Some barrier creams, containing silicone or not, substantially protect the skin surface.

CHEMICAL HAZARDS

867 Waterborne Fluorides and Mortality. T. L. Hagan, M. Pasternack, and Grace C. Scholz. Public Health Repts. 69, 450-454 (May 1954).

This report presents an analysis of mortality from all causes and from five selected causes--heart disease, cancer, intercranial lesions, nephritis, and cirrhosis of the liver-- in 64 cities in 16 states, and compares rates in those states in which water analyses show the fluoride content to be 0.25 ppm. or less with those cities where the fluoride content is 0.7 ppm. or more. These data show no statistically significant difference between the mortality rates of fluoride and nonfluoride cities for all causes or for heart disease, cancer, intercranial lesions, nephritis, or cirrhosis of the liver. -- Authors' summary

868 On Poisonings Caused by Nitrous Fumes and Specially on Pulmonary Change in Them. L. Noro, J. Patiala, and E. Haimi. Med. Deporte Trab. 18, 224-229, 238 (Apr. 1954).

The literature on poisoning by oxides of nitrogen is reviewed and three cases which occurred in Finland are described in detail. The noteworthy feature of two of the cases was the late development of severe disturbances in pulmonary and cardiac functions. These sequels were characterized by fatigue, dyspnea, sweating, and cough. Fibrotic changes and congestion remained in the lungs. The heart was enlarged. Because the condition has remained stationary for two years, it appears very likely that a permanent and compensable disability is present. Little attention has been paid in the literature to these late sequels of nitrogen oxide poisoning.

869 Effect of a Combination of Sulfur Dioxide and Sulfuric Acid on Guinea Pigs. A Preliminary Report. Mary O. Amdur. Public Health Repts. 69, 503-506 (May 1954).

It has been shown that for 8 mg. per cu. m. of sulfuric acid mist and 89 ppm. of sulfur dioxide given in combination to guinea pigs the effect on growth,

lung pathology, and respiration are much more marked than would be predicted from the use of either alone. -- Author's summary

870 Beryllium Extraction, Reduction, and Alloy Fabrication. An Engineering Study Covering Ten Years' Experience. J. Shilen, F. B. Koppenhaver, J. G. Cleland, L. R. Lutz, and Virginia M. Vought. Ind. Med. & Surg. 23, 291-299 (July 1954).

An extensive study is reported of a plant in Pennsylvania where beryllium is extracted and processed. The study shows the normal amount of absenteeism and various exposures to be expected in a plant in the metal industry. There is nothing to indicate that special types of control are necessary. Cuts healed cleanly with no granulomatosis. It is believed that the processing of beryllium can be done with the same degree of protection as that used in processing any other metal. In a few recent cases beryllium poisoning has been suspected, but as of January 1, 1954, this condition has not been conclusively demonstrated. For the past three years beryllium poisoning has been a compensable disease in Pennsylvania, but no claims for such compensation have been filed against this company as of the same date. -- Cond. from authors' summary

871 Microscopic Observations Correlating Toxicity of Beryllium Oxide with Crystal Structure. G. C. Crossmon and W. C. Vandemark. Arch. Ind. Hyg. & Occ. Med. 9, 481-487 (June 1954).

Hall and others (IHF Abst. 949, Aug. 1950) have found that different grades of beryllium oxide varied greatly in toxicity. The authors examined four grades with the polarizing microscope and dispersion staining for differences in birefringence and refractive index which might be correlated with differences in toxicity. The two refractory grades were identical in bi refringence and refractive index. The fluorescent grade contained many particles which appeared to be identical to the refractory grades both in indices and birefringence but were smaller and rod-shaped. Also present in a somewhat higher percentage were particles having a slightly lower index. The special grade contained none of the particles observed in the other grades; all particles had much lower indices and were for the most part singly refracting. Apparently beryllium oxide, depending on the method of manufacture, can exist in several forms differing in refractive index, birefringence, and toxicity. The lower index material with little or no birefringence is the most toxic. -- Cond. from authors' summary

874 Two Acute Fatal Cases of Poisoning by Cadmium Vapor. W. Reinl. Med. Klin. 48, 1891-1893 (Dec. 1953). German.

One source of acute cadmium poisoning is inhalation of the vapor, which may arise during welding, soldering, or smelting. In severe cases, the inhalation is followed first by upper respiratory irritation, then by alternating sensations of heat and cold, nausea, and vomiting, and after one or two days by pharyngitis,

bronchitis, pneumonia, lung edema, and death. The author describes two fatal cases, the first during the manufacture of an anti-rust alloy containing 10% of cadmium, and the second during the production of cadmium anodes. In both cases brown fumes above the molten metal were inhaled. Symptoms and autopsy findings are described. Pathological changes were found in the lungs, intestines, liver, cardiac muscle, and kidneys. The brain contained 0.302 and the lungs 0.196 mg. % of cadmium by polarimetric examination. The cases demonstrate the high toxicity of cadmium oxide vapor and the need for intensive explanation of its danger in factories where it is used. The author suggests treatment by BAL and penicillin. -- Cond. from Bull. Hyg.

873 Effects of Chromates on Nose, Throat, and Ear. J. B. Miller. Arch. Otolaryngol. 58, 171-178 (1953).

In a survey on 100 persons picked at random from a chromate plant in eastern Ohio, 88% showed color variation from normal of the septal mucosa; 65% showed septal perforation, and an additional 27% showed ulceration. In 98% the turbinates showed engorgement, in 93% hypertrophy. Color variations were seen on the pharyngeal mucosa in 61%, on the vocal chords in 29%, and on the oral mucosa in 19%. There was no effect on hearing or smell. The sense of taste was abnormal in 10% of the anterior 2/3 of the tongue and slightly decreased in the posterior third. -- Biol. Absts.

874 The Effect of Cobalt on Blood Pressure, Respiration, and Mortality, and the Use of Dimercaprol as Antidote. T. Dalhamn. Acta Pharmacol. Toxicol. 9, 259-266 (1953).

The LD_{50} for cobaltous nitrate given subcutaneously to mice is 34.6 mg. Co per kg. If 40 mg. per kg. BAL is given simultaneously intraperitoneally, the LD_{50} is 36.7 mg. Co per kg. This difference is statistically significant. In cats 40 mg. per kg. BAL given intra-muscularly completely blocks the depressing effects of 0.1 mg. Co per kg. intravenously on the blood pressure for about four hours. -- Biol. Absts.

875 Treatment of Lead Poisoning by Chelation. L. H. Cotter. J. Am. Med. Assn. 155, 906-908 (July 3, 1954).

The use of chelating agents, in particular calcium versenate in the treatment of lead poisoning, is reviewed, and four cases in which it was used successfully are described. The question of safety of a new drug always arises. In this case, there is a known affinity of disodium calcium versenate for the plasma electrolytes. The chemical data on these patients show that the calcium, copper, sodium, and magnesium content was at no time seriously disturbed. Two patients showed a rise in total serum inorganic phosphate, and two showed a rise in serum copper. The serum cholesterol was low in the average case and was the slowest factor to return to normal.

876 Basophilic Stippling Counts in Lead Poisoning Prophylaxis. E. H. Schiotz. Nord. Hyg. Tidskr. Nos. 1/2, 37-43 (1954). Scandinavian.

In reply to criticisms of the author's belief in the value of stippled cell counts in diagnosis and prophylaxis of lead poisoning, he draws attention to the following features: (1) the apparently wide variation in number of stippled cells from day to day as occasionally observed may be explained by unavoidable random sampling errors involved; (2) a total of 10,000 red cells should be examined to obtain a reasonable degree of accuracy; (3) the counting should be done with scrupulous care, preferably by the darkfield method; (4) additional procedures should always be performed if the number of stippled cells is abnormally increased without definite occupational factors being involved; and (5) the term "poisoning" should not be used unless in the presence of subjective symptoms of disease or of unhealthiness. -- Cond. from Bull. Hyg.

877 Variation of Some Biological Indexes in Tetraethyl Lead Poisoning. A. Morelli and P. Preziosi. Boll. soc. ital. biol. sper. 29, 1453-1455 (1953). Italian.

After intoxication of rabbits with tetraethyl lead, there were changes in glycemia (decrease), azotemia (increase), cholesterolemia (decrease), and proteinemia (great decrease); no change was noted in bilirubinemia. Reactions of Takata and Hanger were impossible to determine on account of the low protein content. -- Chem. Absts.

878 Nickel Poisoning. 3. Studies on Patients Suffering from Acute Exposure to Vapors of Nickel Carbonyl. F. W. Sunderman and J. F. Kincaid. J. Am. Med. Assn. 155, 889-894 (July 3, 1954).

Clinical observations are reported on 36 persons accidentally exposed to nickel carbonyl vapor. Two patients died and many of the others were critically ill. Nickel concentrations in urine and blood were many times the normal. Increase in urinary nickel may be correlated with severity of exposure. Dimercaprol (BAL) was administered to 32 exposed persons, 31 of whom survived. The administration was attended by an increased excretion of nickel in urine and a marked decrease in its concentration in blood. In the authors' opinion, the administration of BAL was beneficial in practically all cases and may have been lifesaving in several. -- Cond. from authors' summary

879 Platinum Allergy. W. Massmann and H. Opitz. Zent. Arbeitsmed. Arbeitsschutz. 4, 1-4 (Jan. 1954).

This paper makes a useful addition to the rather scanty literature on illness due to exposure to platinum salts. The authors examined 15 persons who were working or had worked with platinum salts. Twelve of the total complained

of the symptoms of platinum allergy. Symptoms of irritation of the upper respiratory tract were most frequent, and asthmatic conditions appeared to occur in other cases. Usually the symptoms disappeared one or two hours after ceasing work with the platinum salts. In two workers there was eczema, and in one, an urticaria. A table gives particulars of the symptoms, the blood picture, and the period between the first exposure and the onset of symptoms, which ranges from "soon after" to two years. The toxic agent is the hexachloroplatinate complex, whether in the form of the acid, sodium salt, or ammonium salt; finely divided platinum metal may be inhaled without ill effects.

-- Cond. from Bull. Hyg.

880 Toxicology of Mono-, Di-, and Tri-Propylene Glycol Methyl Ethers. V. K. Rowe, D. D. McCollister, H. C. Spencer, F. Oyen, R. L. Hollingsworth, and V. A. Drill. Arch. Ind. Hyg. & Occ. Med. 9, 509-525 (June 1954).

An extensive study of these glycol methyl ethers is reported. It is concluded that the monopropylene, dipropylene, and tripropylene glycol monomethyl ethers (Dowanols 33B, 50B, and 62B, respectively) present no serious health hazards in industrial handling and use. The materials are all low in single dose oral toxicity and are not significantly irritating to the eyes or skin. Prolonged, extensive contact of large areas of the skin with 33B and 62B probably should be avoided, but 50B is believed suitable for uses involving prolonged and repeated contact with appreciable areas of the skin. Vapor concentrations of these materials which are not disagreeable to human subjects are believed to be safe for prolonged and repeated inhalation. -- Authors' conclusions

881 Studies in Fibrosis of the Liver Induced by Carbon Tetrachloride. K. Aterman. Arch. Pathol. 57, 1-29 (Jan. 1954).

This is a series of three papers. The first is titled "Relation between Hepatocellular Injury and New Formation of Fibrous Tissue." The author concludes that his results bear out Moon's concept of hepatic fibrosis. Further, he has concluded that the vascular factors which determine the localization of cellular lesions in acute poisoning by carbon tetrachloride continue to operate throughout the stage of chronic poisoning. In the second paper, on "A Quantitative Study of the Effect of Cortisone on Fibrosis of the Liver in Rats", the author finds that cortisone leads to a significant reduction in the collagen content and apparently increases the fat content of the liver in the early stages of fibrosis but not in the later stages. In the third paper, on "Pantothenic Acid and Liver Fibrosis", it is concluded that pantothenic acid does not affect materially the development of fibrosis of the liver due to chronic carbon tetrachloride poisoning.

-- Cond. from Bull. Hyg.

882 Health Hazards in the Preparation of Carbon Tetrachloride Insecticides and Fire Extinguishers with Particular Reference to Hepatic Function. C. Sassi and G. Paruccini. Med. lavoro. 45, 93-103 (Feb. 1954). Italian.

Observations are reported on 13 workers in the manufacture of insecticides and extinguishers containing 10% and 97% of carbon tetrachloride respectively. The CCl_4 concentrations ranged for 14 to 67 ppm., averaging about 30 ppm. Two cases of poisoning were found, one acute and the other chronic. Symptoms and pathological findings are described. In the 11 workers without symptoms, santonine and chinine tests were positive in all cases, but other conditions were usually normal. Chronic exposure to CCl_4 in maximum allowable concentration was found to affect greatly the antitoxic function of the liver when other hepatic functions and the blood and renal functions are still sound.

-- Cond. from Public Health Eng. Absts.

883 Acute Carbon Tetrachloride Poisoning during Acute Alcoholic Intoxication. M. Aufdermaur and E. Muheim. Z. Unfallmed. Berufskrankh. 46, 275-282 (Dec. 15, 1953). German.

An acute fatal case of carbon tetrachloride poisoning is described, resulting from exposure to a mixture of carbon tetrachloride and benzene used as a cleaning material. A man and his wife had been cleaning clothes in an open vessel in a small, ill-ventilated kitchen. The wife suffered from nausea and giddiness but recovered after ten minutes, with no residual effect. The man, a chronic alcoholic, and intoxicated at the time, had characteristic symptoms during the next few days and he was admitted to the hospital, with anuria, jaundice of skin and conjunctivae, and tenderness over the liver. Diuresis could not be produced; the urine contained 12% of albumin, red and white cells, but no casts. Death took place on the 11th day. Autopsy showed glomerular tubulonephrosis, interstitial nephritis, central acinar necrosis of liver cells, edema of the brain and lungs, and coronary sclerosis. The diagnosis of acute carbon tetrachloride poisoning in which susceptibility was increased by alcoholic intoxication is supported by (1) the general tissue and liver injury attributed to alcohol, and (2) the solvent capacity of alcohol present in the blood for carbon tetrachloride. Appropriate labeling of such cleaning materials should be more rigidly enforced.

-- Cond. from Bull. Hyg.

884 The Toxicity of the Dinitro-Cresols. 2. D. G. Harvey, J. Pharm. & Pharmacol. 5, 497-510 (1953).

When o-cresol contaminated by the meta and para isomers is nitrated, the resulting 4, 6- dinitro-o-cresol (DNOC) may contain dinitro-p-cresol and trinitro-m-cresol as impurities. The former appears to be as toxic to mice as DNOC and to cause similar symptoms. Trinitro-m-cresol has about 12% of the toxicity of DNOC in mice and results in different symptoms. A simple chromatographic method is described for the detection of the two impurities.

-- Cond. from Biol. Absts.

885 Toxic Chemicals in Agriculture. Residues in Food. Report of the Working Party on Precautionary Measures against Toxic Chemicals Used in Agriculture. 32 pp. (1953). For sale by British Information Service, 30 Rockefeller Plaza, New York 20, N. Y. 40 cents.

An earlier report (IHF Abst. 419, Apr, 1952) dealt with hazards to persons applying noxious chemicals in agriculture. The present report is concerned with the possible hazards to the consumer who eats food treated with or exposed to toxic chemicals. The report is largely a compilation of existing knowledge on the treatment of food in Great Britain, the present law, the part played by industry, present methods of controlling the sale and use of crop-protecting chemicals, and existing facilities for obtaining and disseminating information about them. Recommendations are made regarding an Advisory Committee whose functions include advice to Departments, research, and development of analytical methods. The use of bacterial rodenticides should be limited and eventually discontinued.

An appendix lists the various insecticides, fungicides, herbicides, and rodenticides, showing the persistence and site of action of each.

886 Anticholinesterases. Symposium. Society of Chemical Industry (Agriculture Group, Crop Protection Panel), Society of Public Analysts, Association of Applied Biologists, and Pharmacological Society, London. Mar. 27-29 and Oct. 2, 1953. Chemistry & Industry, pp. 524-532 (May 8, 1954); 593-594 (May 22); 617-621 (May 29); 674-676 (June 12); 749-751 (June 26, 1954).

The subjects of papers presented at the two sessions of this Symposium include metabolic conversion of organic phosphorus compounds into anticholinesterases, their formation in the plant, the function of acetylcholine and cholinesterase in the body, methods of biological assay, effect of repeated doses, and esterase levels in the nervous system. These papers are based on animal experiments. One paper is of direct interest in the industrial hygiene field:

Paralysis in Man Following Poisoning by Cholinesterase Inhibitors. P. Lesley Bidstrup and J. A. Bonnell. pp. 674-676 (June 12). Two cases of poisoning are fully described, one by triorthocresyl phosphate and the other by bis (monoisopropylamino) fluorophosphine oxide, known commercially as Mipafox. Paralysis was the principal feature of the poisoning in both cases, and the action of the two chemicals is similar. Some degree of recovery has occurred in both cases, but in the first one at least, full recovery is not predicted. In the authors' opinion paralysis following Mipafox poisoning is at first due solely to neuromuscular block. Secondary effects may of course follow upon prolonged failure of conduction at the neuromuscular junctions. This aspect of poisoning by cholinesterase inhibitors requires further investigation by histopathological techniques.

387 Cholinesterases and the Mode of Action of Some Anticholinesterases. D. R. Davies. J. Pharm. Pharmacol. 6, 1-26 (Jan. 1954).

The progress made in the study of cholinesterase, acetyl choline, and anticholinesterase drugs during the last two or three years is reviewed. The biochemistry of these materials is discussed extensively, including the effects of the most common anticholinesterase compounds, which are the organic phosphorus compounds used as insecticides. The value of cholinesterase determination in the red blood cells and plasma is shown. -- Cond. from Bull. Hyg.

688 The Mechanism of Inhibition of Cholinesterase by Organophosphorus Compounds. W. N. Aldridge and A. N. Davison. Biochem. J. 55, 763-766 (Dec. 1953).

Reaction of organophosphorus inhibitors (of the general formula $(R)_2$ (X) PO where X is the group labile to hydrolysis) with cholinesterase produces the same inhibited enzyme provided the R groups are maintained even though X is varied. This is a direct confirmation of the phosphorylation mechanism for inhibition. -- Authors' summary (Bull. Hyg.)

889 Tricresyl Phosphates and Cholinesterase. W. N. Aldridge. Biochem. J. 56, 185-189 (Feb. 1954).

Using a solubility test, the in vitro inhibitory power of tri-o-cresyl phosphate against cholinesterase has been shown to be due to an active impurity. A purified specimen possessed negligible in vitro activity. The in vivo inhibitory power of TOCP against cholinesterase in the rabbit, rats, and chickens cannot be accounted for by its in vitro activity. Oral doses of tri-m- and tri-p-cresyl phosphates do not produce inhibition of the cholinesterase of chicken serum and do not produce more than traces of demyelation in the spinal cord.
-- Author's summary (Bull. Hyg.)

890 Systox: Its Pharmacologic Action. W. B. Deichmann. Federation Proc. 13, 346-347 (Mar. 1954). Abstract.

Systox is a potent organic phosphate insecticide. Chemically it is o, o-diethyl-o-2 (ethylmercapto) ethyl thiophosphate. When absorbed into the tissues of various experimental animals, toxic doses of Systox and its isomer Iso-Systox induce effects like those observed after marked stimulation of the cholinergic fibers of the autonomic nervous system. Systox, like other organic phosphates, causes marked inhibition or destruction of cholinesterase, and hence an accumulation of acetylcholine. This in turn is followed by augmented neuromuscular transmission. Whether or not Systox has a specific action per se has not been proved. The signs of intoxication corresponded to those of other anticholinesterase inhibitors. Most of the animals died in coma, occasionally with mild asphyxial convulsions. Peripheral respiratory failure played an important

part in death. Atropine sulfate is a potent antidote. Buscopan (IHF Abst. 382, Apr. 1953) was found equally protective in animals. -- Condensed

891 Malathion--Cyanamid's Versatile Insecticide. R. G. Tousey. Agr. Chemicals. 9, 49-50 (July 1954).

The uses and advantages of malathion as an insecticide are discussed. Toxicity to man is discussed briefly. A table compares the toxicity of malathion with that of six of the other most common insecticides. The acute oral toxicity is shown to be less than that of four of the others, while it is lowest in dermal and chronic toxicity. Like all phosphate ester insecticides, malathion is a cholinesterase inhibitor, although a weak one, and must be handled with care. There is no problem of residues.

892 The Control of Occupational Cancer of the Bladder. T. S. Scott. Trans. Assn. Ind. Med. Officers. 3, 309-315 (Jan. 1954).

Bladder cancer is a hazard in the manufacture and use of beta-naphthylamine, benzidine, and probably alpha-naphthylamine. Although occupational bladder tumors were formerly known as "aniline" cancers, there is no evidence that aniline causes cancer. The tumors occur as benign papilloma and carcinoma. They appear after a latent period varying from four to 32 years, and the process of tumor development is not arrested by removal from contact.

Preventive measures consist primarily in preventing exposure, including enclosed systems, or in substitution of a less hazardous material. The latter method has been used in the case of beta-naphthylamine. Selection of workers depends on a high standard of personal hygiene and microscopic examination of blood and urine. Selection of men aged over 40 is preferable because they are less likely to develop a tumor during their lifetime. Good health and strong physique have no relation to resistance to bladder carcinogens. Cleanliness, changes of clothing, and use of protective clothing are enforced. The same men are kept on the job; the employment of men for short periods has been advocated, but a few months' exposure may lead to tumors, so that it is best to confine the risk to the smallest number.

Diagnosis can be made with certainty only by cystoscopy. Routine cystoscopy is not acceptable to the workers. Examination of stained smears of urinary deposit should be followed by cystoscopy if positive indications are found. Treatment by the urologist may consist of electrocoagulation with or without gold seed implantation, deep x-rays, or intracavity irradiation. Total cystectomy is advocated only when other methods of attack have failed.

893 Skin Cancer in Tar Workers. R. E. W. Fisher. Trans. Assn. Ind. Med. Officers. 3, 315-318 (Jan. 1954).

Tar cancer, in an early stage, is curable. If this were generally known in industry and in the medical profession, no employer would ask any man to work

with tar without arranging for him to be placed under competent medical care. Tar has also the following effects on the exposed parts of the skin: (1) affections of the follicles; (2) acute tar erythema; (3) changes in skin color; (4) chronic tar dermatosis; and (5) tar warts and epipheliomata. Chronic tar dermatitis includes changes in texture of the skin, Whitfield's plane warts, freckles, capillary telangiectases, and rough hyperkeratoses. These skin effects are described. Tar warts and epitheliomata are probably best treated with local x-rays or radium. Local excision can be used in the rare cases which fail to react to x-rays. The usual preventive measures are not entirely effective.

894 Carcinogenic Studies on Adsorbates of Industrially Polluted Raw and Finished Water Supplies. W. C. Hueper and C. C. Ruchhoft. Arch. Ind. Hyg. & Occ. Med. 9, 488-495 (June 1954).

Bioassays of four eluates of carbon adsorbates of raw and finished surface water supplies for carcinogenic properties showed that the eluates prepared from raw water polluted with an oil refinery effluent were weakly positive when painted on the skin of mice (C57).

Eluates prepared from raw river water polluted by various industrial wastes and from finished water obtained from a different but similarly contaminated source gave negative results.

Since these results were obtained with materials representing adsorbates containing any active agents in highly concentrated form, it remains at present uncertain whether the observations made have any direct application to population groups consuming water polluted with industrial wastes. The preliminary studies indicate, moreover, that the chemical type of water pollutants seems to determine the kind and degree of tissue responses which are elicited when activated carbon adsorbates are applied to the skin of mice. -- Authors' conclusions

895 An Approach to Solvent Safety. J. B. Moore. Natl. Safety News. 70, 32, 33, 96 (July 1954).

There is really no such thing as a "safety solvent," but newer types are considerably less toxic and less flammable than the older types. The history of solvent usage shows many attempts to suppress flammability of petroleum solvents and decrease toxic effects of carbon tetrachloride by mixtures of the two. These attempts were unsuccessful owing to differences in volatilization, and the false sense of security in using them. Today, relatively stable blends which do not contain carbon tetrachloride are being produced. A number of meritorious products have resulted, but others are accompanied by a wide variety of claims which are not substantiated. A choice of solvent must be based on what it must do, under what circumstances must it do it, and what are the limiting factors of safety. The common denominators of solvent selection are: (1) high dielectric breakdown strength and non-conductivity; (2) no oily residues; (3) heavier than water; (4) adequate drying speed; (5) cleaning effectiveness without damage to insulation; (6) flammability at safe margins; and (7) toxicological factors in accordance with manner

and area of use, with due regard for possible symbiotic combinations. A number of examples of choice of solvent for particular operations are given. Claims must not be accepted without substantiation. Eventually a uniform labeling law covering hazardous chemicals will be enacted, and in the meantime users should be trained in the meaning of label wordings, with the aid of the Manufacturing Chemists' Association Label Bulletin L-1.

896 Safe Handling Procedures for Compounds Developed by the Petro-Chemical Industry. C. H. Hine and N. W. Jacobsen. Am. Ind. Hyg. Assn. Quart. 15, 141-144 (June 1954).

This paper describes the methods used in establishing safe handling procedures for petro-chemicals originating in the Shell Development laboratories. For each new compound, the problem is defined in terms of (1) toxicity of the compound, (2) the number and training of exposed persons, and (3) industrial hygiene aspects of preparation and development. The steps in the procedure, taken in the order of these problems, are described. The results of this program have been most satisfactory. No fatalities have occurred from chemical exposure, intoxications from exposure have been kept to a minimum, and a background of know-how in handling compounds safely has been developed.

INDUSTRIAL DUSTS

897 Dust Control; Tests of Efficacy of Mask Filters. A. Houberechts and G. Degueldre. Institut d'Hygiene des Mines, Hasselt, Belgium. Comm. No. 103, 21 pp. (1953). French.

This paper describes and discusses previous methods of testing mask filters and describes tests recently evolved in Belgium. The tests employed in France and Germany are summarized and discussed. They are criticized on the grounds that not enough attention is paid to dependency of efficiency on particle size, and that the measurements of resistance are not closely enough related to discomfort in breathing. The new Belgian tests have been designed to overcome these objections. They are intended to simulate conditions encountered in use, and in particular the breathing cycle of men working at different levels of activity. Actual tests on a number of mask filters are reported in Communications Nos. 110 and 111. -- Cond. from Bull. Hyg.

898 The Clinical Evaluation of Disability in Silicosis. J. Frost and J. Georg. Acta Med. Scand. 147, 349-357 (Dec. 1953).

No correlation has been established between the x-ray picture, the symptoms, and the degree of disability in cases of silicosis. Clinical examinations and measurements of pulmonary function were carried out on 50 cases of silicosis without tuberculosis, cardiac disease, or high blood pressure. X-ray films were taken, fluoroscopic examinations were made of diaphragmatic movements, and electrocardiagrams were made. Vital, residual, and total capacity of the lungs, and maximum breathing capacity were measured, and a special working test on a bicycle-ergometer was made. The cases were grouped into three stages of silicosis. Significant differences were noted between the total capacity, vital capacity, and maximum breathing capacity, respectively, in stage three and stage one, but differences between stage two and stage one, were insignificant. The relations between total lung volume and x-ray stages of silicosis showed a rough parallelism. Pulmonary emphysema, as indicated by expressing the residual capacity as a percentage of the total lung volume, showed a similar relation. Advanced emphysema was present only in stage one and two silicosis. No obvious correlation was found to exist between x-ray stages of silicosis and the subject's working capacity. Compensation should not be assessed purely on x-ray findings. -- Cond. from Bull. Hyg.

899 Pathological-Anatomical Aspects of Porcelain-Dust Lung in Upper Franconia. E. Kirch. Beitr. Silikose-Forsch. No. 25, 1-29 (1953). German.

The author regards the porcelain-dust lung as a "mixed-dust" silicosis, since the porcelain mass is said to contain nine to 32% of free silica. Statistics on the post-mortem findings are given. Severe compensable silicosis was present in 35 of the 136 cases, and was always accompanied by cardiac hypertrophy which was practically always the cause of death. The pathological features are described; in some respects they differed somewhat from those commonly found in silicosis.

Massive fibrosis, with a tendency to the formation of multiple indurated masses, varying from the size of a man's fist to complete induration of one or two lobes, was a characteristic feature of the severe uncomplicated silicotic cases, the usual small discrete nodules being a less prominent feature. Hyaline nodules, when present, were smaller than in other forms of silicosis and were often surrounded by a wide thick layer of dust cells. The indurated nuclei and the regional lymph nodes often showed a greenish or bluish coloration. Old pleuritic lesions were more commonly found than in pure silicosis. Tuberculosis when present was usually of a progressive caseating character. The lesions are illustrated by photographs. -- Cond. from Bull. Hyg.

900 The Permeability of Lung Parenchyma to Particulate Matter. P. Gross and Marian Westrick. Am. J. Pathol. 30, 195-213 (Mar.-Apr. 1954). Reprints are available from the Foundation.

It has been possible to demonstrate that particulate matter per se may penetrate the respiratory membrane and migrate to perivascular and peribronchial positions without the mediation of phagocytic cells. Penetration of the respiratory membrane occurs in multiple, small, scattered foci near the apposition to alveoli and larger vessels and bronchi. Although not demonstrated, it is nevertheless probable that the penetration of the respiratory membrane by particulate matter is dependent upon defects in the membrane, possibly in the form of erosions. Direct penetration of the alveolar lining by sufficiently fine particles is also a possibility. Important physical factors which make penetration of the respiratory membrane and the migration of particles possible are the fluctuating pressures of the respiratory cycle and the respiratory excursions of the lung tissue.

On the basis of present experimental observations it would appear that most interstitial pneumoconiotic pigment deposits are probably extracellular agglomerations of particles. Assertions that pigment had been carried to its interstitial pulmonary position by macrophages are conjectural and are based upon a theory which is physiologically unsound. The experimental support of this theory is founded upon a premise which is unacceptable in the light of our present knowledge. More convincing supportive data should be required for the continued acceptance of the theory of the "emigrating-immigrating" or "returning" macrophage.

-- Authors' summary

901 Experimental Investigation on Dust Phagocytosis. R. Gersing and H. Schumacher. Beitr. Silikose-Forsch. No. 25, 31-61 (1953). German.

In an attempt to investigate the relative phagocytic capacity of leucocytes and macrophages, the variations in their structure during phagocytosis of different dusts, the behavior of the dust within the cell, and the influence of particle size on phagocytosis, the authors used a special technique of contrast microscopy and cinematography. Leucocytes and macrophages were isolated and studied separately. The movements and actions of each are described. Leucocytes cannot effectively take up particles greater than three microns; larger particles are broken up and re-transported; small particles are at first deposited in the ectoplasm, near the surface, to which they tend to adhere in such quantity that the cell often becomes unrecognizable. The macrophages can phagocytose particles of ten microns, which are deposited in the endoplasm. The authors found little difference in the manner and extent of the intake of various dusts--carbon, quartz, aluminum, iron, and limestone--by macrophages, or in the reaction of the cells themselves, except in the case of quartz.

This was more rapidly and readily phagocytosed than other dusts and the dust-filled cells lost their activity earlier and showed more vacuolation. The quartz particles also remained isolated and equally distributed within the cells, in contrast to the dust conglomerations formed by carbon and other mineral dusts. Polymorphonuclear leucocytes were found to have only a small capacity for

phagocytosis of dusts other than quartz. The article is well illustrated by photographs giving a clear demonstration of the process of phagocytosis and the behavior of the phagocytic cells. -- Cond. from Bull. Hyg.

902 Lung Function in Silicosis and Prognosis after Cessation of Exposure to Dust. P. Luchsinger and A. Buhlmann. Z. Unfallmed. Berufskrankh. 46, 282-288 (Dec. 15, 1953). German.

The authors have attempted to determine whether lung function in silicosis bears any relation to the radiographic variations, whether there is any difference in functional condition in different occupational groups, and what is the progress of silicosis after exposure to dust. The 300 men investigated included 105 miners, 18 sand blasters, 44 foundrymen, casters and core makers, 52 stone hewers, and nine metal grinders. Radiographic examination showed no silicosis in 12%, grade one in 41%, grade two in 26%, and grade three in 21%. The time of exposure before manifest silicosis appeared was longest in the stone hewers and breakers, and shortest in the miners and sand blasters. In individual cases no relation was found between x-ray variations and lung function, but on the average the lung function deteriorated with increasing x-ray signs.

There was no essential difference in functional condition in the various occupational groups. Repeated investigation of 46 patients after removal from exposure showed that in more than half the lung function and x-ray picture had remained stationary, and in a quarter the lung function had improved. Only three had deteriorated; these had been grade three when first investigated.

-- Cond. from Bull. Hyg.

903 Silicotuberculosis and the Tuberculo-Pneumoconioses. P. Galy. Arch. maladies profess. 14, 573-583 (1953). French.

French compensation law requires differential diagnosis between silicotic fibrosis with its typical nodules and the caseous nodules of pulmonary tuberculosis. The author discusses the complex relationships between tuberculosis and silicosis and points out that the effects of silica and other dusts must be well known before the findings of tuberculosis can be distinguished. The history and kind of dust exposure must be considered. Sometimes treatment by an antibiotic drug may aid in diagnosis since it may cause the dissolution of a nodular structure due to tuberculosis but not one due to silicosis. Differential diagnosis is usually difficult, although knowledge of symptoms, x-ray examination, and tomography are of value. The difficulty in diagnosis can disappear only when the presence of tuberculosis at any stage of silicosis is recognized to be part of the clinical picture. -- Cond. from Bull. Hyg.

904 Adsorption of Protein on Silica Surfaces. P. F. Holt and J. E. L. Bowcott. Arch. Ind. Hyg. & Occ. Med. 9, 503-506 (June 1954).

Quartz surfaces will adsorb albumin. The degree of adsorption depends

upon the PH. From albumin solutions having a concentration comparable with plasma only about one-tenth of the available adsorption sites on a quartz surface are filled at PH 7.4. The adsorption of proteins upon the quartz surface is not considered to be an important aspect of the silicosis problem.

-- Authors' conclusions

905 The Presence of Asbestos Fibers in Urine of Workers Exposed to Asbestos Hazard. V. Wyss. Rass. med. ind. 22, 55-56 (1953). Italian.

In urinary sediment of two asbestos workers asbestos fibers were seen; the same finding was detected in urine of two female patients suffering from asbestosis, who had left their work seven years before. -- Biol. Absts.

PHYSICAL ASPECTS OF THE ENVIRONMENT

906 Some Practical Aspects of Industrial Noise Measurement. L. J. Proulx. Arch. Ind. Hyg. & Occ. Med. 9, 496-502 (June 1954).

Some of the instrumentation problems faced by an engineer who must evaluate industrial noise environments are discussed. An array of equipment which includes a sound level meter, octave band analyzer, tape recorder, dynamic microphone, audio oscillator, vacuum tube voltmeter, high-fidelity crystal headphones, cathode ray oscilloscope, and a good quality loudspeaker is described. The use of the tape recorder and oscilloscope for measuring impact noises is given particular attention. Various calibration checks are described.

907 The Locus of Short Duration Auditory Fatigue or "Adaptation." J. D. Harris and Anita L. Rawnsley. J. Exptl. Psychol. 46, 457-461 (1953).

Auditory adaptation, defined as a reversible shift in threshold following very mild acoustic stimulation, was distinguished from true auditory fatigue by four criteria: (1) the non-cumulative effect of stimulus duration; (2) the temporal course of return to normal threshold following stimulation; (3) the relative frequency region of maximum threshold shift following pure tone stimulation; and (4) the shape of the curve of loudness (recruitment.) This experiment sought to throw light upon where, in the auditory system, adaptation occurs. By the technique of simultaneous binaural loudness balancing between one normal ear undergoing a threshold shift of a preceding adapting stimulus, it was possible to demonstrate an accelerated growth of recruitment in the adapted ear. The intimate

temporal relation between adaptation and recruitment, the latter distinctly allied to the organ of Corti, was thought to point to the peripheral organ, not the nervous system, as the site of the recently-discovered phenomenon of auditory adaptation. -- Authors' summary (Biol. Absts.)

908 Noise. G. Blumenauer, III. J. Am. Med. Assn. 155, 1007 (July 10, 1954).

The author briefly discusses noise in the office, clinic, and hospital, with attention to reverberation and transmission through structural parts of buildings. Isolation of noise at the source and design of buildings so as to minimize transmission are recommended.

909 Facts and Fallacies about Your Eyes. Hedwig S. Kuhn. Natl. Safety News. 70, 20, 21, 102, 103 (July 1954).

The author exposes a number of common fallacies about eyes. Eye "exercises" do not remedy refractive defects, but orthoptic training and recognition training are useful in improving efficiency of vision. Some of the fallacies relate to cataracts. A cataract in one eye should be removed, even if the other eye is sound. It is not necessary to wait for a cataract to "ripen" before it is removed, There are no "inside" and "outside" cataracts. Cataracts cannot be "dissolved" by drugs. It is possible that in the future, surgeons will be able to insert a plastic lens in place of a living lens, but it is only a bare possibility and is in the research stage. Several myths are concerned with the use of sun glasses. There is no need of protection against excessive light, except in such cases as looking directly at the sun, and in those cases sun glasses are insufficient. Fluorescent lights produce no more ultraviolet light than incandescent lights, and are no more harmful. An eye injury, a chemical burn, or redness of the eyes calls for sound medical treatment; home remedies and drug store treatments are ineffective.

910 Industrial Lighting. A Reprint of American Standard Practice for Industrial Lighting Approved August 22, 1952. U. S. Dept. Labor, Bureau of Labor Standards, Washington 25, D. C. 40 pp. (1953). Obtainable from Bureau of Labor Standards.

The standards presented in this publication are the result of extensive work by the Illuminating Engineering Society, with the collaboration of the Bureau of Labor Standards. The reprint is a revision of publications of the American Standards Association. Other organizations have cooperated in gathering the data for the standards. The purposes of industrial lighting are to help provide a safe working environment, to provide efficient and comfortable seeing as an aid to all types of industrial operation, and to aid in the conservation of vision and energy. The three factors that contribute to seeing are the task, the environment, and the lighting. These factors are individually treated in considerable detail, and a number of tables and illustrations aid in clarifying the subjects discussed. Specific recommended values of illumination are tabulated for a wide variety of occupations.

911 Nystagmus in Otherwise Normal Coal Miners. R. C. Browne and I. Flora Beck. Brit. Med. J. 1, 1176-1179 (May 22, 1954).

Fifty consecutive men with coal-miners' nystagmus are compared with 47 randomly chosen miners without the disease, matched in respect of age, detailed job, and colliery. The nystagmus group did not suffer more psychological disease than the controls. There was no difference between the two groups in medical histories, weights, modes of living, work preference, or outside interests. The men with nystagmus had slightly higher pulse and respiration rates than the controls. They also climbed their professional ladder a little more quickly and spent slightly more time at higher positions. The results of this study confirm those of one made eight years earlier, and, when related to the experiemental production of this condition, lend no support to the opinion that coal-miners' nystagmus is primarily a psychological rather than a somatic condition. -- Cond. from authors' summary

912 Experimental Fatigue. A. Desmarais. Occ. Health Rev. (Canada) 5, 2. :, 26 (Mar. 1954).

The results of fatigue tests are often deceiving, but some tests can useful when after comparison of their results it is found that each one can b: interpreted in the same way. Two tests were critically studied. The blood lactic acid level was found to be of no help in determining whether or not fat: was present. It could be useful, however, in certain circumstances, for in: e in determining whether or not an individual is fit for a given type of work. MacQuarrie test for mechanical ability comprises seven sub-tests. Three he sub-tests were chosen for investigation. The results were inconclusive unc he conditions, but the method deserves further investigation. Animal experim c the administration of ascorbic acid showed that it enhances adaptation and r t-ance to work and increases the effectiveness of cortico-adrenal hormones, decreases the total work of the adrenal glands.

913 The Physiology of Work and Industrial Fatigue. G. A. Bergeron. Occ. Hea th Rev. (Canada) 5, 5-10 (Mar. 1954).

Some aspects of the physiology of work are outlined with respect to its application to the problem of industrial fatigue. Industrial fatigue is defined, its divisions are specified, its criteria are outlined, and some tests devised to detect it are described. Fatigue is divided according to its origin, into muscular fatigue and mental and sensorial fatigue. There is no necessary correlation between the two. Manifestations of both types are discussed. Among the tests for fatigue are the cardiac rate, variations in blood pressure, lactic acid level in the blood, body temperature and water loss. The Donaggio test, involving the determination of certain colloidal substances in the urine, is still in the experimental stage, but gives promise of being useful. Altogether, the problem of industrial fatigue has multiple aspects. It must be remembered that the human machine cannot be as rigidly accurate as a mechanical device.

914 Muscle Spasm in Manual Laborers. A. Hiltunen, M. J. Karvonen, J. Kihlberg, and R. Lamminpaa. Arch. Ind. Hyg. & Occ. Med. 9, 476-480 (June 1954).

The authors present information on the incidence of myalgia among manual laborers and its distribution among the major muscle groups. The incidence is also classified according to type of work. The results indicate that hard and painful muscles are of common occurrence among manual laborers. The affection is evidently commonest in muscles which are doing static work, like those of the calf. The incidence is also related to the amount of physical work. The effect is probably a direct one on the muscles employed. Mental tension and climatic changes may also be contributing causes. The pathological physiology of myalgia is still poorly understood. Its incidence is so high that no system of medical care or sickness insurance can be expected to deal with every case. The patient should be duly informed and should be anxious to do something about getting rid of the affliction. The problem of myalgia belongs, in the first place, to the realm of personal hygiene rather than to that of curative medicine.

RADIOACTIVITY AND X-RADIATION

915 State Control of Protection against Ionizing Radiation. L. S. Taylor. Am. J. Roentgenol. Rad. Therapy. 71, 691-702 (1954).

Practices in various countries relating to protection against ionizing radiation are reviewed. Problems in the development of a philosophy and codes of practice relative to the use of radiation and its control by the state are discussed. -- Nuclear Sci. Absts.

916 Air Contamination and Respiratory Protection in Radioisotope Work. G. W. Morgan and C. R. Buchanan. Atomic Energy Comm. Publication. AECU-2821. 29 pp. (Jan. 1953).

Air contamination associated with the use of radioactive isotopes in the laboratory is discussed. Positive control measures to prevent contamination are emphasized. The various forms of possible contamination and mechanisms influencing their stability in the air are discussed. Data are included on maximum permissible air contamination values, the pathway of inhaled contaminants once they enter the respiratory system, and the characteristic absorption, deposition, and pulmonary retention pattern of contaminants. The characteristics of various respiratory protective devices are discussed. -- Nuclear Sci. Absts.

917 Nine Cases of Irradiation Damage to Anterior Wall of Chest: Fatal Outcome in One Case. R. Birkner and J. Schaaf. Strahlentherapie. 93, 454-465 (1954). German.

The authors present histories of nine patients who sustained irradiation damage of the chondro-osseous chest wall. The majority of these patients were women who had received postoperative radiation following breast resection for carcinoma. The group also included one man with mammary carcinoma and two men with bronchial carcinoma. Spontaneous rib fractures and damage to the cartilages, skin and other soft tissues were delayed as long as ten years; in others the interval ranged from six months to seven years. Data on the sites of lesions, fields irradiated, estimated focal doses, and effective bone doses are also reported. The authors feel that other unknown biological factors, such as individual variations in sensitivity of the bones to irradiation, might play a contributing part. -- J. Am. Med. Assn.

918 Industrial Health Center in an Atomic Energy Project. R. M. Taylor. Occ. Health Rev. 5, 1-4 (Mar. 1954).

The facilities of the new Health Center at the Chalk River Project of Atomic Energy of Canada Limited are described and illustrated. The radiation hazard necessitated facilities and space considerably in excess of those required in an ordinary industrial hospital.

919 Radioactive Wastes: Treatment, Use, Disposal. W. A. Rodger. Chem. Eng. Prog. 50, 263-266 (May 1954).

The various methods of handling and disposal of radioactive wastes are discussed. The three philosophies of waste disposal might be called: (1) dispersal. (2) controlled containment; and (3) partially controlled containment. The selection of one of these philosophies or a combination of them is the first step in determining how a waste problem is to be handled. The radiation constants of wastes, accumulation of fission products, and methods of bulk reduction, and utilization of fission products are considered. Some suggestions are made regarding storage as concentrated liquids and immobilization as solids.

The most important lessons still to be learned by management in the application of human relations are: (1) Never forget that the first syllable of management is man; (2) Man is not a machine. -- Ind. Med. & Surg.

ENVIRONMENTAL MEASUREMENTS

920 Iodometric Determination of Selenium in Ores and Flue Dusts. C. W. Sill and H. E. Peterson. Bur. Mines Rept. Invest. 5047. 9 pp. (May 1954). Free copies obtainable from Publications Div., U. S. Bureau of Mines, 4800 Forbes Street, Pittsburgh 13, Penna.

Several methods for selenium determination are critically reviewed and a method is described which includes the best features of the others. They all consist of reduction of the selenium by potassium iodide and titration of the liberated iodine with thiosulfate, but the sharpness and stability of the starch endpoint depend upon a number of factors which are best applied in the recommended method.

921 Portable Methane-Detecting Appliances Approved under United States Bureau of Mines Standard. E. J. Gleim. Bur. Mines Rept. Invest. 5056, 6 pp. (Apr. 1954). Obtainable free from Publications Div., U. S. Bureau of Mines, 4800 Forbes Street, Pittsburgh 13, Penna.

The standards applied are those of schedule 8C, issued in 1935. The schedule provides for two general classes of instruments or devices, namely detectors and indicating detectors. The first class is applicable in the range one to 3% methane. In the second class indications as low as 0.25% methane must be given, with a recommended upper limit of 4%. Twelve instruments are listed as approved, but only four are actively marketed today. They are described and illustrated.

922 Lessons from Intensive Dust Sampling of a Coal Mine. I. Hartmann, J. Nagy, and J. K. Rauschenberger. Bur. Mines Rept. Invest. 5054, 12 pp. (Apr. 1954). Obtainable free from Publications Div., U. S. Bureau of Mines, 4800 Forbes Street, Pittsburgh 13, Penna.

This paper summarizes the more important findings from a survey conducted by the Bureau in an Indiana coal mine, discusses several samplings at several Pennsylvania coal mines, and discusses related studies in the Bureau's experimental mine. Weights and percentages of incombustible dust at various sampling locations are compared and recommendations are made for representative sampling. One point in the conclusion is that the quantity of dust on haulageways and other roads may be excessively high, thus requiring very large tonnages

of rock dust. Every effort should be made to persuade mine operators to reduce dust formation during mining and to allay and clean up all dust that is formed.

923 Dust Sampling by Thermal Precipitation. I. G. Poppoff. Am. Ind. Hyg. Assn. Quart. 15, 145-151 (June 1954).

Thermal precipitation provides an ideal sample for electron microscopic analysis because the thermal precipitator collects small dust particles without agglomerization or size discrimination, at least below 10 microns, and its action is gentle enough to allow precipitation directly and without damage on Formvar-covered electron microscope screens. On the other hand, there are still the disadvantages of low sampling rates and possible discrimination in the range above 10 microns. Also, there is a pronounced lack of quantitative data regarding a number of factors. It is hoped that further investigation of thermal precipitation will provide even more adequate means of collecting microscopic and submicroscopic particles. -- Cond. from author's summary

924 Catalytic Combustion. Evaluation of Catalysts. A. Turk. Am. Ind. Hyg. Assn. Quart. 15, 119-123 (June 1954).

This report describes equipment and methods for evaluating pelleted or granular combustion catalysts. The equipment can be easily modified for evaluation of other types of catalyst. The important aspects of catalyst performance, including the effect of process variables, are outlined. Those factors must be considered in selecting and making tests. Results of specific tests are given and several conclusions relating to particular contaminants are drawn.

PREVENTIVE ENGINEERING

925 Exhaust Rates for Dust Control. Theoretical Requirements in Bulk Material Handling Systems. W. C. L. Hemeon. Am. Ind. Hyg. Assn. Quart. 15, 132-135 (June 1954); Heat. & Vent. 51, 71-73 (July 1954).

The material presented here is condensed from a chapter in the author's forthcoming book on "Plant and Process Ventilation." It is well known that the required rate of exhaust from an enclosure, especially in bulk materials handling systems, is often dependent upon the rate at which air entrained by the falling motion of the individual particles is pumped into the enclosure. The author

has examined the nature of the phenomenon and analyzed the energy relationships involved. A mathematical presentation of these relationships is given. The general laws of air motion as applied to the problem are summarized on the basis of the calculations.

The maximum theoretical rate of air induction due to a stream of falling particles in turbulent motion is proportional to: (1) the cube root of the tonnage rate of solids flow; (2) the cube root of specific gravity of solids; (3) the cube root of particle diameter; (4) the 2/3 power of solids stream cross-sectional area; and (5) the 2/3 power of falling distance. For practical purposes turbulent floro may be regarded as confined to particles larger than about 2 mm., and to columns whose falling distance considerably exceeds two or three feet.

926 Design Criteria for Industrial Heating and Ventilation. M. A. O'Neill. Heat. & Vent. 51, 80-82 (June 1954).

The criteria of heating and ventilating design are concerned with: (1) process and comfort requirement; (2) potential hazard to health; (3) climatic conditions; (4) requirements of codes and laws; and (5) generally accepted standards for cleanliness of air, both inside and outside the plant. Design is discussed in relation to these criteria. Air supply, infiltration, natural and supplied ventilation, equipment, and dust, fume, and mist control are considered, and suggestions are given for suitable exhaust velocities, heating units, air intake, and other factors.

927 The Observation and Control of Dust at Portable Abrasive Wheels and Pneumatic Chisels. A. T. Holman. E. B. James, and W. B. Lawrie. Paper presented before The Institution of Mechanical Engineers, London. 12 pp. (Apr. 1954).

The desirable features in the development of a dust-control system for a portable machine are: (1) the system should be an integral part of the machine; (2) it should be designed as an inconspicuous part of the machine; (3) very little additional weight should be tolerated; and (4) the machine should retain its flexibility. The paper describes a new form of dust control for portable grinders and for pneumatic chisels. The main effort has been directed to the control of dust within the respirable size range, and the system was evolved as the result of observation of the paths taken by the airborne dust. Still photographs from the motion-picture film are included. -- Cond. from Engrs. Digest

928 Elements of Dust and Mist Collection. C. E. Lapple. Chem. Eng. Progr. 50, 283-287 (June 1954).

The various types of dust and mist collection equipment are considered and some general suggestions are given for choosing the type suitable for a particular purpose. Particle size, dust or mist concentration, collection efficiency, and cost are the most important factors to be considered. Until a few

years ago the practical application of dust and mist collection was concerned mainly with the relatively large particles (over five microns) in high concentrations, but on account of the interest in air-pollution abatement, the emphasis has shifted to removal of the smaller particles at low concentrations. Although numerous techniques have been developed and used, they still lack the combination of rapidity, reliability, and standardization.

929 Plant Design for Health Protection. T. Hatch. Chem. & Eng. News. 32, 2995-2996 (July 26, 1954).

This is a condensation of a paper presented at the Engineering Conference of the 18th Annual Meeting of Industrial Hygiene Foundation.

COMMUNITY AIR HYGIENE

930 Air Pollution Abatement Manual. Chapter 11. Manual Sheet P-12. Evaluation of Data. L. L. Falk. Manufacturing Chemists' Association, 1625 Eye Street, Washington 6, D. C. 23 pp. (1953). 35 cents.

The type of an air pollution study may vary from simple performance checks of equipment for abatement to large-scale municipal surveys involving many factors. The method of evaluation of the data depends on the scope and purpose of the investigation. Methods of evaluation may be divided into two broad categories: statistical and comparative. The elements of statistical study are reviewed and its application to certain types of problems is described. Methods of obtaining averages, probability analyses, and estimation of degree of atmospheric pollution and of long-and-short-range improvement are included in the discussion. Some examples of misinterpretation of data are given. Comparative methods are frequently used, in which the data obtained are compared with those similarly obtained in other locations or with those obtained with other types of equipment. Sources of information for comparative analyses are listed. (The series of manuals is now complete, except that additional bibliographic summaries will be issued semiannually.)

931 Air-Pollution Work of the U. S. Bureau of Mines. J. F. Barkley. APCA (Air Pollution Control Assn.) News. 2, 1, 2, 5 (July 1954).

The work of the Bureau of Mines on air pollution can be classified into these types: (1) research on smoke, dust, fumes, and gases from fuel burning or

from metallurgical processes, mainly to prevent waste of natural resources; (2) studies of pollutants from the health or safety standpoint; and (3) development and tests of methods and instruments for measuring air pollutants. The work in each of these fields is reviewed briefly.

932 Sanitary Engineering Aspects of Atmospheric Pollution. L. C. McCabe. Proc. Am. Soc. Civil Engrs., Separate No. 392, (Jan. 1954).

Odor production by many industries is now of primary concern as a factor in atmospheric pollution. Incineration of waste and garbage remains a major source of pollution. Recent studies indicate that oxidation products of hydrocarbons are seriously detrimental to crops and to human health. In metropolitan areas the automobile has been shown to be a serious source of atmospheric pollutants. The development of residential areas around hitherto isolated industrial plants has brought new problems which have caused cities to reappraise zoning procedures. New devices for measuring atmospheric pollution have been developed and more are needed. The control of such pollution is being recognized as a technical problem requiring the use of technically trained personnel.

-- Cond. from Public Health Eng. Absts.

933 Field Studies of the Diffusion of Aerosols. M. L. Barad and B. Shorr. Am. Ind. Hyg. Assn. Quart. 15, 136-140 (June 1954).

Relatively high ground dosages are found when an effluent is emitted from an elevated source during superadiabatic conditions. Experiments are described in which an oil-fog aerosol is emitted from a generator mounted 185 feet above ground on the meteorology tower at the Hanford Atomic Products Operation. The distributions of puffs reaching the ground during two field tests are presented. The modal distance from the tower at which the puffs reach the ground is shown to depend on the wind speed. A sampling technique based upon the fluorescent properties of the oil is described.

934 Study of Turbulent Diffusion by Atmospheric Eddies. M. E. Smith. Trans. N. Y. Acad. Sci. 15, 118 (1953).

As our understanding of atmospheric turbulence increases, it becomes more and more obvious that oversimplified solutions are likely to be misleading, because of the complex effects of plant aerodynamics, effluent characteristics, and terrain and meteorological factors. The oil-fog studies conducted at Brookhaven National Laboratory are reviewed to illustrate the wide variation in dispersion conditions, resulting from meteorological factors alone. When it is considered that each plant has a unique combination of effluent characteristics, stack parameters, and plant aerodynamics, it becomes obvious that a thorough analysis of all factors is necessary to achieve acceptable results.

935 The Significance of Instantaneous Peak Concentrations in Air Pollution. J. S. Sharrah. APCA (Air Pollution Control Assn.) News. 2, 3-4 (July 1954).

In customary measurements of air pollution, samples are taken continuously for 20 minutes or longer. An average value thus obtained is suitable for many purposes, but brief peak concentrations are missed. These peak concentrations are important from the standpoints of health, effects of irritant gases, annoyance from particulate matter, effect on vegetation, and the soiling, corrosive, and deteriorating effects of air pollution. Examples are given of peak concentrations of sulfur dioxide, hydrogen sulfide, and carbon monoxide, which were not detected by continuous sampling, but were plainly shown by short-time sampling, and were noticeable by odor or otherwise and were the occasion for complaints. Concentrations of five ppm. of sulfur dioxide, 175 ppm. of hydrogen sulfide, and 450 ppm. of carbon monoxide for short periods were thus detected. An example of the effect of peak concentrations is the darkening of paint by hydrogen sulfide.

MANAGEMENT ASPECTS

936 Responsibility of the Professions in the Health Education of the Employee. Viewpoint of the Industrial Hygienist. C. M. Berry. Ind. Med. & Surg. 23, 300-302 (July 1954).

Worker education is an important part of industrial hygiene. The worker is entitled to know the hazards of his employment, and most compensation laws require that he be so informed. Many education programs have been unsuccessful because they do not arouse the active interest of the employee; for instance: posters are not designed to appeal to his intelligence, and billboards are cluttered with useless information. The author discusses various factors in employee education and summarizes them in a check list as follows: (1) have your objectives and material clear in mind; (2) choose a propitious time for the presentations; (3) have the confidence of the worker; (4) be sure that you have his attention; (5) make a convincing presentation; (6) make it applicable to the group involved; (7) make it "the thing" to do; (8) enlist the aid, experience, advice, and thinking of the worker; (9) aim for the establishment of good working habits so that procedural patterns will be followed automatically; (10) follow up with periodic reviews; (11) watch for rumors and stop them promptly; and (12) use all teaching aids and techniques that are available and usable. Worker education should begin when a man is employed. Verbal, written, and visual methods are discussed as parts of the program.

937 Responsibility of the Professions in the Health Education of the Employee. Viewpoint of the Industrial Psychologist. W. A. Eggert. Ind. Med. & Surg. 23, 303-306 (July 1954).

The specific function of the industrial psychologist in the health program is to assist employees in attaining a wholesome mental outlook toward their jobs. The following types of activity in fulfilling those functions are discussed: (1) assisting in job placement of employees; (2) providing intelligent supervision; (3) individual counseling; (4) giving direction to the promotional policy of the company; (5) giving direction to employee benefit programs; (6) instituting both formal and informal educational programs; (7) properly interpreting employee thinking to management and management policy to employees; (8) instituting physical appeals which often serve as "psychological lifts" to the employee; (9) encouraging employees to be good neighbors in their community; (10) giving attention to training executives; (11) giving direction and counsel to the safety education program; and (12) encouraging greater acceptance by the employee of the recommendations made by the hygienist, nurse, and physician.

938 Workmen's Compensation under the Federal Laws. Marjorie W. Grigsby. Arch. Ind. Hyg. & Occ. Med. 9, 451-475 (June 1954).

Federal workmen's compensation may be divided into two separate categories administered by the Bureau of Employee's Compensation. The first refers to occupations carried on by civilian workers of the Federal Government. The second group comprises private employment in the District of Columbia, certain employments of a maritime nature, and construction work at outlying defense bases. The first group is covered by the Federal Employee's Compensation Act, and the second by the Longshoremen's and Harbor Workers' Compensation Act. The administration and provisions of these Acts and the facilities for medical care and rehabilitation are fully described.

ACCIDENTS AND PREVENTION

939 The Investigation, Diagnosis, and Treatment of Injuries at Work. R. A. Trevethick. Trans. Assn. Ind. Med. Officers, 3, 301-304 (Jan. 1954).

A large proportion of the millions of injuries from accidents at work each year are, very properly, treated at work. Facilities for treatment vary greatly among industrial plants, but in general an injury can be better treated at work than

by a general practitioner. Proper treatment at work calls for the highest order of services, and there is much room for improvement in the standard of treatment, particularly in the ambulance room staffed by first-aiders. The author gives a number of suggestions for the treatment of various injuries. Discussions of this and "Accident Prevention" (Abst. No. 941) is reported (pp. 305-309 of the Transactions), also a debate on "Treatment in the Factory", conducted at a later meeting (pp. 325-333).

940 Some Theoretical Aspects of Industrial Accident Causation--The Accident Sequence. H. A. Hepburn. Occ. Safety & Health (Geneva) 3, 113-118 (July-Sept. 1953).

The concept of an accident as being an unexpected, untoward event, entirely fortuitous in its development, and not subject to laws such as govern in chemistry or physics, does not bear logical investigation. Every industrial accident can be regarded as the result of an experiment for the purpose of ascertaining whether or not some particular operation can be carried out safely. This article attempts to study some neglected causal aspects of industrial accidents. Four factors, the personal, the material, the proximate causal, and the unsafe actional, all converging in a relatively short time, produce an accident, unless advantage can be taken of the escape period which is dependent on the time of convergence. If the period of time allows the personal or material factor to be withdrawn from the sequence, the accident will be avoided. Removal may be effected by: (1) natural means, i.e. quick perception of the approaching danger; (2) mechanical means which remove the person from the hazardous situation; (3) automatic devices that stop action; and (4) safety links or chains which sustain a load should the suspension device foul at a critical moment. An escape period which depends solely on an individual should not be relied on. Therefore, only means independent of personal factors should be used.

Accident prevention involves: (1) careful attention to the material and proximate factors by safety and production executives; (2) correcting by education and training the propensities of individuals to perform unsafe acts; and (3) preventing the development of unsafe actional events during the course of employment. A study of an actual tragic accident is given, with an explanation of how it might have been avoided. -- Cond. from Bull. Hyg.

941 Accident Prevention. A. Taylor. Trans. Assn. Ind. Med. Officers. 3, 296-301 (Jan. 1954).

The author summarizes the sequence of the causes of injuries as follows: (1) industrial injuries result only from accidents; (2) accidents are invariably caused by unsafe acts of persons, or by exposure to unsafe conditions; (3) unsafe acts and conditions are caused only by faults of persons; and finally (4) faults of persons are created by environment or acquired by inheritance. Therefore the method of control must be directed toward man-failure. One of the most important functions of the safety officer is to coordinate the activities of all concerned in the interests of safety. The author defines an accident, for the purpose of

frequency rate calculations, as one which results in injury being received by a workman at a moment of time, in the course of his work, and which causes loss of time beyond the day or shift in which it has occurred.

The function of the safety department is: (1) to investigate accidents and collect all relevant information concerning them; (2) to tabulate that information in such a way as to enable lessons to be deduced from it; (3) to organize training in safety; (4) to inspect safety devices; (5) to keep all statutory records relating to safety; (6) to coordinate the accident prevention program; and (7) to maintain liaison with medical and welfare services. Each of these functions is discussed.

942 Accident Prevention in Nonferrous-Metal Processing Plants. Section 1. Injury Statistics. U. S. Bureau of Mines. 75 pp. (1954). For sale by Supt. of Documents, U. S. Govt. Printing Office, Washington 25, D. C. 40 cents.

This pocket-size handbook is the first of three on the subject, and deals with general accident statistics in the mineral industry, with particular reference to nonferrous-metal processing plants. Other subjects discussed are the value of accident reports and injury statistics, classification of injuries, methods of computing, frequency and severity rates, accident investigations and reports, direct and indirect cost of accidents, and causes of personal injuries. A number of companies have cooperated in supplying complete operation and injury data. Studies were made in more than 80 plants. Progress in reducing both fatal and nonfatal injuries is noted on the part of the mineral industries, but improvement in recent years by the nonferrous processing plants has been only slight. The responsibility of each individual employee, as well as that of management, is emphasized.

943 The Accident Parade. K. T. Johnstone. Ind. Med. & Surg. 23, 207-208 (July 1954).

The Accident Parade of injuries leaves fascinating footprints for those who will read them. It is possible by tabulation and simple mathematics to discern concrete changes in the rate of accident occurences in the plant. By consideration of the time of the accidents, it is possible to spot the shift or even the job that is the prime factor in ruining the safety record. It is completely feasible for a supervisor to know which individuals are involved in an excessive number of injuries, and to be certain of his knowledge. Handled correctly, the worker can be led and assisted in correcting the situation. Furthermore, supervisors can now request check-ups on employees knowing that they are needed, and the advice may fall on fertile ground. -- Author's summary

944 Flameproofing Fabrics. W. Stark. Natl. Safety News. 70, 72, 74, 75 (July 1954).

Industry's demands for flameproofed work clothes and new methods of treatment are offering new opportunities for commercial laundries. Several

manufacturers are experimenting with "durable" types of fire retardants, but none is as yet successful by the standards of the industrial launderer. There are several non-durable types of fire retardant that work very well when re-treated after each washing. Some do's and don'ts are given for the laundering of the durable and non-durable types. Treatment of the durable type with ammonium phosphate after each washing will aid in maintaining its efficiency during the life of the fabric. A number of suggestions and cautions are given.

945 Take a Camera with You. A. B. Hoftiezer. Natl. Safety News. 70, 26-27 (July 1954).

A safety man should take a camera on his plant inspections, as it will be useful in illustrating both good and bad safety practices and in displaying them later. A picture is often more effective than written comments in demonstrating proper ways to conduct operations and in making recommendations.

946 The Mechanism of Ignition of Firedamp by Explosives. R. L. Grant and C. M. Mason. Bur. Mines Rept. Invest. 5049, 8 pp. (Apr. 1954). Free copies obtainable from Publications Div., U. S. Bureau of Mines, 4800 Forbes Street, Pittsburgh 13, Penna.

This paper is the third in a series of progress reports of a long-term investigation at the Bureau's experimental mine. Experiments are described and interpreted that extend and support the concept of ignition presented previously. Two points brought out in the present study are the importance of oxygen concentration and the difference between dynamite and black powder in the mechanism of ignition.

947 Laboratory Explosibility Study of American Coals. I. Hartmann, M. Jacobson, and R. P. Williams. Bur. Mines Rept. Invest. 5052, 8 pp. (Apr. 1954). Free copies obtainable from Publications Div., U. S. Bureau of Mines, 4800 Forbes Street, Pittsburgh 13, Penna.

The present investigation of American coal dusts ranging from lignite to meta-anthracite indicates that: (a) The ignition sensitivity and the explosion hazard of coal dusts generally increases with increase in volatile ratio, but not in direct linear relationship; (b) the hazard of coal-dust explosions in an oxygen atmosphere is several times as great as in air; (c) explosibility increases with reduction in particle size; addition of 10 to 40 percent through-200-mesh coal dust to coarser aggregates has an important effect on ignition sensitivity; (d) the effect of moisture on coal dust explosibility is unimportant below about 10 percent; (e) increase in initial pressure and surrounding temperature increases the explosion hazard; (f) release of explosions to adjoining larger spaces of limited volume presents special problems and might result in strong explosions in the larger enclosure; (g) some dust explosions can be quenched successfully during their initial stage, and secondary explosions can be prevented by prompt dispersal of quenching agents. -- Authors' summary

948 Occupational Hazards of the Fire Service. C. W. Irwin. Firemen (Natl. Fire Protection Assn.); Occ. Hazards. 16, 34-38 (July 1954).

Firemen's occupational hazards fall into two groups: (1) injury; (2) disease. Compensation of disabled firemen is inconsistent. Most firemen are protected from financial loss due to injury, and many are protected from such loss due to disease if it is uncontestably due to the work, but secondary disabilities are hard to relate to the job, and claims for such disabilities are often contested. The individual is the prime cause in many cases, because he may be psychologically or physically unsuited for the work or has had insufficient training. Inadequate equipment and the situations faced by firemen, such as collapse of walls, explosion of gases, and falling of live wires are other causes of disability. The most common diseases affecting firemen are asphyxia, respiratory irritation from smoke, gas poisoning, and pneumonia and tuberculosis. Heart disease may be aggravated. Psychiatric and neurologic diseases are not directly caused by the occupation, but may be aggravated by the life of a fireman. A number of preventive actions are recommended. In summary, they include: (1) reduction of disability by proper selection and training of fire fighters; (2) intelligent use of adequate equipment; (3) awareness of the causes of disability; and (4) proper handling of disability cases. Associated with the last recommendation is an effort to change compensation laws to protect the insurance carrier from unwarranted claims and to cover diseases aggravated by fire service.

949 How Industry Enlists the Family in Safety. A. G. Larke. Dun's Rev.-Modern Ind. 63, 33-35 (June 1954).

One way of selling safety to the employee and his supervisors is to enlist his wife and family in the campaign to make him a safer worker. Methods used by various companies in making families safety-conscious are described. Among the methods are safety essay contests, quiz questions over the telephone, distribution of booklets on safety and poster contests.

MISCELLANEOUS

950 Surface Disinfection and Respiratory Ills. E. G. Klarmann. Modern Sanit. 6, 17-21, 62, 63 (June 1954).

It seems fair to say that the several techniques aiming at the sterilization of air have not proved adequate in controlling the spread of respiratory infection,

or in suppressing the all-important "secondary reservoirs" of the respective fomites. On the other hand, correct use of surface disinfection appears to represent a logical forward step in this direction. This conclusion is supported by the bacteriological data gathered to date. Such preparations should be non-specific in their rapid bactericidal action, and to the bactericidal potential of the disinfected surface should endure between individual applications. Their non-specific microbicidal potency should include tuberculocidal and fungicidal properties. Supplementary requirements should specify freedom from toxicity or corrosiveness to tissue, and absence of any capacity for injury to the surfaces or objects to be disinfected. Lasting objectionable odor should be absent.

-- Cond. from author's conclusions

951 Glycol Vaporizers for Disinfecting Air. Queries and Minor Notes. J. Am. Med. Assn. 155, 945 (July 3, 1954).

Information is requested regarding the efficiency of a device to vaporize glycols with trichloroethylene used as a preventive for upper respiratory infections. The reply states that trichloroethylene is not used with such devices. The use of triethylene glycol vapors for the control of bacteria in large spaces has been reported. It has been shown successful under experimental conditions. On the other hand, studies under practical conditions have demonstrated no reduction in the number of airborne bacteria, in the absence rate, or in the incidence of minor respiratory illnesses. The general application of glycol vaporizers for disinfecting air in homes or public places as a practical method of preventing the spread of upper respiratory diseases cannot be recommended.

952 The Prevention of Gas Gangrene and Tetanus. O. P. Hampton, Jr. Ind. Med. & Surg. 23, 309-314 (July 1954).

Gas gangrene and tetanus are anerobic wound infections caused by bacteria of the Clostridia group. Each is accompanied by a severe toxemia and high mortality. Both are out-and-out clinical diagnoses. The symptoms and therapy of gas gangrene and of a similar but less dangerous infection, anerobic cellulitis, are fully described. Two points are emphasized: (1) there is no such thing as passive immunization against gas gangrene; and (2) the only prophylaxis of gas gangrene is early and adequate wound surgery (debridement) with the wound left open. The symptoms of tetanus are described. The incidence of tetanus both in war and civilian surgery has been markedly reduced by passive immunization with tetanus antitoxin reasonably soon after wounding. The use of the antitoxin is discussed at length. Therapy is based upon (1) arrest of the action of the toxin; (2) prevention of muscular spasm; and (3) prevention of aspiration and pneumonia. Therapy includes sedation, tetanus antitoxin, nothing by mouth, intravenous fluids, tracheotomy, wound care, and special nursing care.

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