



Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL

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INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE + PITTSBURGH 12, PA.

11 206 0686

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EXHIBIT**

0414

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available to our members solely for their information, by way of keeping them posted on developments.

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INDUSTRIAL HYGIENE FEATURES

The pulmonary evaluation of surgical patients is discussed in Abst. No. 914.

Do heart disease patients benefit from work recommendations? Abst. No. 915.

Abst. No. 918 is concerned with the effects of smoking.

For an account of office management of common medical conditions consult Abst. No. 925.

Abst. No. 929 presents information on the occupational toxicity of cultivated flowers.

Abst. No. 934 reports on hydrogen sulfide intoxication concerning two cases of nonfatal poisoning.

Chromyl chloride—a possible important industrial air contaminant is investigated in Abst. No. 937.

Lead poisoning and hemoglobin synthesis are reviewed in Abst. No. 940.

An account of the consequences of ethylene glycol poisoning is given in Abst. No. 941.

Four cases of methyl alcohol poisoning are described in Abst. No. 942.

For a discussion on the toxicity of ingested hexachlorophene, See Abst. No. 947.

Data on the basic pathology of pneumoconiosis are presented in Abst. No. 950.

Pneumoconiosis case-finding in industry and detection of sources of exposure is the title of Abst. No. 958.

Information regarding the directional dependence of air samplers is given in Abst. No. 960.

A genetic survey of the offspring of x-ray workers is given in Abst. No. 972.

For a discussion on the realities of rehabilitation, consult Abst. No. 992.

FOUNDATION FACTS

27th ANNUAL MEETING THIS MONTH. We are looking forward to having representatives from all our member companies with us on October 24 and 25 for our 27th Annual Meeting. Advance registration promises peak attendance. We feel certain that with the broad scope of subject matter and the distinguished roster of speakers that this meeting merits the interest and enthusiasm expressed by the membership. The officers of the Foundation also have a full program, with meetings scheduled for the Executive Committee and the Board of Trustees.

NEW MEMBERS. The Foundation is pleased to announce two new members:

International Research and Development Corporation
Louisiana Ordnance Plant, Remington Rand Div., Sperry Rand Corp.

DR. BLAINE B. WESCOTT, Chairman, I-H-F Board of Trustees, was awarded an honorary Doctor of Science Degree at the University of Pittsburgh's 175th Anniversary Alumni Honors Convocation on September 17.

THRESHOLD LIMIT VALUES. The Threshold Limit Values for 1962, adopted by the American Conference of Governmental Industrial Hygienists at their 24th Annual Meeting in Washington, D.C., on May 13-15, appear in this issue of the Digest. Additional copies are available upon request.

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INDUSTRIAL HYGIENE TRAINING COURSE

Conducted by

INDUSTRIAL HYGIENE FOUNDATION

and

OCCUPATIONAL HEALTH RESEARCH AND TRAINING FACILITY
UNITED STATES PUBLIC HEALTH SERVICE

at

Mellon Institute, Pittsburgh, Pa., September 10-21, 1962



Engineers in attendance at the third annual Industrial Hygiene Training Course.

Seated - Left to Right: G. M. Reynolds, Hazleton Laboratories, Inc.; R. W. Bloomquist, General Mills, Inc.; G. L. Dietz, Merck & Company, Inc.; D. A. Cohagan, Western Electric Company; R. H. Snow, Western Electric Company; and G. C. Frisby, Kennecott Copper Corp.

Standing - Left to Right: R. B. Hubbard, Maryland Casualty Company; J. M. Plunkett, Aluminum Company of America; H. W. Rapp, Jr., The Travelers Insurance Company; B. G. Sykes, Jr., Pennsylvania Glass Sand Company; R. A. Hudspeth, Kennecott Copper Corp.; F. W. Sandell, Johns-Manville Products Corp.; and R. P. Hibbard, The Boeing Company.

(Also attended some of the courses, but not in picture: Eugene Barry (Alternate: A. T. Sabo), of Nuclear Materials & Equipment Corp.).

This was the third training course conducted by the Foundation in cooperation with the United States Public Health Service, for industrial hygiene engineers. It too, proved to be very successful and the results most gratifying. It was an intensive two-weeks devoted to laboratory work, lectures, films, in-plant tours, and homework assignments. The students individually prepared known concentrations of gases and vapors, calibrated gas sampling instruments, used gas detectors, made chemical analyses and ventilation measurements. Lectures and demonstrations covered such subjects as pneumoconioses, toxicology, radiation, noise, and industrial hygiene practice. The course was completed with a final examination followed by presentation of Certificates of Training. The business-like and industrious attitude of the students was highly commendable. Again, we feel that the course served a useful purpose and provided the participants with a knowledge and experience which will serve them well. Applications are being accepted for the fourth training course to be held in September, 1963.

THRESHOLD LIMIT VALUES 1962^{1/}

Adopted at the 24th Annual Meeting of the American Conference of Governmental Industrial Hygienists, Washington, D.C., May 13-15, 1962

These values 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 under which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse effect. The values listed refer to time-weighted average concentrations for a normal workday. The amount by which these figures may be exceeded for short periods without injury to health depends upon a number of factors such as the nature of the contaminant, whether very high concentrations even for short periods produce acute poisoning, whether the effects are cumulative, the frequency with which high concentrations occur, and the duration of such periods. All must be taken into consideration in arriving at a decision as to whether a hazardous situation exists. Special consideration should be given to the application of these values in assessing the health hazards which may be associated with exposure to combinations of two or more substances.

Threshold limits are based on the best available information from industrial experience, from experimental studies, and, when possible, from a combination of the two. These values are based on various criteria of toxic effects or on marked discomfort; thus, they should not be used as a common denominator of toxicity, nor should they be considered as the sole criterion in proving or disproving diagnosis of suspected occupational disease.

These limits are intended for use in the field of industrial hygiene and should be employed by persons trained in this field. They are not intended for use, or for modification for use, (1) as a relative index of toxicity, by making a ratio of two limits, or (2) in the evaluation or control of community air pollution or air pollution nuisances.

These values are reviewed annually by the Committee on Threshold Limits for changes, revisions, or additions as further information becomes available. The Committee welcomes the suggestion of substances to be added to the list and also comments, references, or reports of experience with these materials.

Substance	Recommended Values		Substance		
	PPM ^{2/}	Mg/M ³ #		PPM ^{2/}	Mg/M ³ #
Acetaldehyde	200	360	ANTU (alpha-naphthylthiourea)	---	0.3
Acetic acid	10	25	Arsenic	---	0.5
Acetic anhydride	5	20	Arsine	0.05	0.2
Acetone	1000	2400	Barium (soluble compounds)	---	0.5
Acetonitrile	40	70	Benzene (benzol)	25	80
Acetylene tetrabromide	1	14	Benzyl chloride	1	5
Acrolein	0.5	1.2	Beryllium	---	0.002
Acrylonitrile - skin	20	45	Boron oxide	---	15
Aldrin (1, 2, 3, 4, 10, 10-hexachloro-1, 4, 4a, 5, 8, 8a-hexahydro-1, 4, 5, 8-dimethanonaphthalene) - skin	---	0.25	Boron trifluoride	1	3
Allyl alcohol - skin	2	5	Bromine	0.1	0.7
Allyl chloride	5	15	Butadiene (1, 3-butadiene)	1000	2200
Allyl glycidyl ether (AGE)	10	45	2-Butanone (methyl ethyl ketone)	200	590
Allyl propyl disulfide	2	12	2-Butoxy ethanol (Butyl Cellosolve)	50	240
Ammonia	100	70	Butyl acetate (n-butyl acetate)	200	950
Ammonium sulfamate (Ammate)	---	15	Butyl alcohol	100	300
Amyl acetate	200	1050	tert. Butyl alcohol	100	300
Amyl alcohol (isoamyl alcohol)	100	360	Butylamine	5	15
Aniline - skin	5	19	n-Butyl glycidyl ether (BGE)	50	270
Antimony	---	0.5	Butyl mercaptan	10	35
			p-tert. Butyltoluene	10	60
			Cadmium oxide fume	---	0.1
			* Calcium arsenate	---	1

^{1/} Reprinted with permission from the American Conference of Governmental Industrial Hygienists.

^{2/} Parts of vapor or gas per million parts of air by volume at 25°C and 760 mm. Hg pressure.

Approximate milligrams of particulate per cubic meter of air.

^{3/} Millions of particles per cubic foot of air, based on the standard procedure for sampling and counting dusts adopted by the Fifth Annual Meeting of ACGIH (1942).

^{4/} Approximate milligrams per cubic meter of air.

• 1962 Revision

** 1962 Addition

Note: The word "skin" following a substance indicates that the liquid can penetrate the skin to contribute to the exposure.

I.

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Recommended Values (cont.)

Substance	PPM ^{2/}	Mg/M ³ [#]	Substance	PPM ^{2/}	Mg/M ³ [#]
Carbon dioxide	5000	9000	Diglycidyl ether (DGE)	10	55
Carbon disulfide - skin	20	60	Diisobutyl ketone	50	290
Carbon monoxide	100	110	Dimethylaniline (N-dimethyl- aniline) - skin	5	25
Carbon tetrachloride - skin	10	65	Dimethylformamide	20	60
Chlordane (1,2,4,5,6,7,8,8- octachloro-3a,4,7,7a-tetra- hydro-4,7-methanoindene) ---		0.5	1,1-Dimethylhydrazine - skin	0.5	1
Chlorinated camphene, 60% ---		0.5	Dimethylsulfate - skin	1	5
Chlorinated diphenyl oxide ---		0.5	Dinitrobenzene - skin	---	1
Chlorine	1	3	Dinitrotoluene - skin	---	1.5
Chlorine dioxide	0.1	0.3	Dinitro-o-cresol - skin	---	0.2
Chlorine trifluoride	0.1	0.4	Dioxane (diethylene dioxide)	100	360
Chloroacetaldehyde	1	3	Dipropylene glycol methyl ether	100	600
Chlorobenzene (monochloro- benzene)	75	350	EPN (O-ethyl O-p-nitrophenyl thionobenzenephosphonate)-skin---		0.5
Chlorodiphenyl (42% Chlorine) - skin ---		1	Ethyl acetate	400	1400
Chlorodiphenyl (54% Chlorine) - skin ---		0.5	Ethyl acrylate - skin	25	100
Chloroform (trichloro- methane)	50	240	Ethyl alcohol (Ethanol)	1000	1900
1-Chloro-1-nitropropane	20	100	Ethylamine	25	45
Chloropicrin	0.1	0.7	Ethylbenzene	200	870
Chloroprene (2-chloro-1,3- butadiene)	25	90	Ethyl bromide	200	890
Chromic acid and chromates (as CrO ₃) ---		0.1	Ethyl chloride	1000	2600
Crag [®] herbicide (sodium 2-[2,4-dichlorophenoxy] ethanol hydrogen sulfate) ---		15	Ethyl ether	400	1200
Cresol (all isomers) - skin	5	22	Ethyl formate	100	300
Cyanide (as CN) - skin	---	5	Ethyl mercaptan	250	640
Cyclohexane	400	1400	Ethyl silicate	100	850
Cyclohexanol	50	200	Ethylene chlorohydrin - skin	5	16
Cyclohexanone	50	200	Ethylenediamine	10	30
Cyclohexene	400	1350	Ethylene glycol dinitrate - skin	0.2	1.2
2,4-D (2,4-dichloro- phenoxyacetic acid) ---		10	Ethylene imine - skin	5	9
DDT (2,2-bis [p-chloro- phenyl] - 1,1,1-trichloro- ethane) - skin ---		1	Ethylene oxide	50	90
Decaborane - skin	0.05	0.3	2-Ethoxyethanol (Cellosolve)	200	740
Diacetone alcohol (4-hydroxy- 4-methyl-2-pentanone)	50	240	2-Ethoxyethylacetate (Cellosolve acetate)	100	540
Diborane	0.1	0.1	Ferbam (ferric dimethyl dithiocarbamate)	---	15
1,2-Dibromoethane (Ethylene dibromide)	25	190	Ferrovanadium dust	---	1
o-Dichlorobenzene	50	300	Fluoride	---	2.5
p-Dichlorobenzene	75	450	Fluorine	0.1	0.2
Dichlorodifluoromethane	1000	4950	Fluorotrichloromethane	1000	5600
1,1-Dichloroethane	100	400	Formaldehyde	5	6
1,2-Dichloroethane (Ethylene dichloride)	50	200	Furfural	5	20
1,2-Dichloroethylene	200	790	Furfuryl alcohol	50	200
Dichloroethyl ether	15	90	Gasoline	500	2000
Dichloromonofluoromethane	1000	4200	Glycidol (2,3-epoxy-1-propanol)	50	150
1,1-Dichloro-1-nitroethane	10	60	Heptane (n-heptane)	500	2000
Dichlorotetrafluoroethane	1000	7000	Hexane (n-hexane)	500	1800
Dieldrin (1,2,3,4,10,10- hexachloro-6,7-epoxy-1, 4,4a,5,6,7,8,8a-octahydro- 1,4,5,8-dimethanonaphtha- lene) - skin ---		0.25	Hexanone (methyl butyl ketone)	100	410
Diethylamine	25	75	sec-Hexyl acetate	100	590
Difluorodibromomethane	100	860	Hexone (methyl isobutyl ketone)	100	410
			Hydrazine - skin	1	1.3
			Hydrogen bromide	3	10
			Hydrogen chloride	5	7
			Hydrogen cyanide - skin	10	11
			Hydrogen fluoride	3	2
			Hydrogen peroxide, 90%	1	1.4
			Hydrogen selenide	0.05	0.2
			Hydrogen sulfide	20	30
			Hydroquinone	---	2
			Iodine	0.1	1
			Iron oxide fume	---	15
			Isophorone	25	140
			Isopropylamine	5	12
			Isopropyl glycidyl ether (IGE)	50	240
			Lead	---	0.2
			Lead arsenate	---	0.15

II.

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Recommended Values (cont.)

Substance	PPM ² /	Mg/M ³ #	Substance	PPM ² /	Mg/M ³ #
Lindane (hexachlorocyclohexane, gamma isomer)	---	0.5	Pentane	1000	2950
Lithium hydride	---	0.025	Perchloroethylene (tetra-chloroethylene)	100	670
Magnesium oxide fume	---	15	Perchloromethyl mercaptan	0.1	0.8
Malathion (O, O-dimethyl dithiophosphate of diethyl mercaptosuccinate) - skin	---	15	Phenol - skin	5	19
Manganese	---	5	Phenyl glycidyl ether (PGE)	50	310
Mercury	---	0.1	Phenyhydrazine - skin	5	22
Mercury (organic compounds) - skin	---	0.01	Phosgene (carbonyl chloride)	1	4
Mesityl oxide	25	100	Phosphine	0.05	0.07
Methoxychlor (2,2-di-p-methoxyphenyl-1,1-tri-chloroethane)	---	15	Phosphoric acid	---	1
Methyl acetate	200	610	Phosphorus (yellow)	---	0.1
Methyl acetylene	1000	1650	Phosphorus pentachloride	---	1
Methyl acrylate - skin	10	35	Phosphorus pentasulfide	---	1
Methylal (dimethoxy-methane)	1000	3100	Phosphorus trichloride	0.5	3
Methyl alcohol (Methanol)	200	260	Picric acid - skin	---	0.1
Methyl bromide - skin	20	80	Propyl acetate	200	840
Methyl cellosolve (2-methoxy-ethanol)	25	80	Propyl alcohol		
Methyl cellosolve acetate			(isopropyl alcohol)	400	980
(ethylene glycol mono-methyl ether acetate)	25	120	Propyl ether (isopropyl ether)	500	2100
Methyl chloride	100	210	n-Propyl nitrate	25	110
Methyl chloroform (1,1,1-trichloroethane)	500	2700	Propylene dichloride		
Methylcyclohexane	500	2000	(1,2-dichloropropane)	75	350
Methylcyclohexanol	100	470	Propylene imine - skin	25	60
Methylcyclohexanone	100	460	Propylene oxide	100	240
Methyl formate	100	250	* Pyrethrum	---	5
Methyl isobutyl carbinol			Pyridine	5	15
(methyl amyl alcohol)	25	100	Quinone	0.1	0.4
Methyl mercaptan	50	100	Rotenone (commercial)	---	5
* Methyl styrene	100	480	Selenium compounds, (as Se)	---	0.1
Methylene chloride (di-chloromethane)	500	1750	* Sodium fluoroacetate (1080) - skin	---	0.05
Monomethyl aniline - skin	2	9	Sodium hydroxide	---	2
Molybdenum			Stibine	0.1	0.5
(soluble compounds)	---	5	Stoddard solvent	500	2900
(insoluble compounds)	---	15	Strychnine	---	0.15
Naphtha (coal tar)	200	800	Styrene monomer		
Naphtha (petroleum)	500	2000	(phenylethylene)	100	420
Nickel carbonyl	0.001	0.007	Sulfur dioxide	5	13
Nicotine - skin	---	0.5	Sulfur hexafluoride	1000	6000
Nitric acid	10	25	Sulfuric acid	---	1
p-Nitroaniline - skin	1	6	Sulfur monochloride	1	6
Nitrobenzene - skin	1	5	Sulfur pentafluoride	0.025	0.25
Nitroethane	100	310	TEDP (tetraethyl dithiono-pyrophosphate) - skin	---	0.2
Nitrogen dioxide	5	9	TEPP (tetraethyl pyrophosphate) - skin	---	0.05
* Nitroglycerin - skin	0.2	2	Tellurium	---	0.1
Nitromethane	100	250	1,1,2,2-Tetrachloroethane - skin	5	35
2-Nitropropane	25	90	Tetrahydrofuran	200	590
Nitrotoluene - skin	5	30	Tetranitromethane	1	8
Octane	500	2350	Tetryl (2,4,6-trinitrophenyl-methylnitramine) - skin	---	1.5
Ozone	0.1	0.2	Thallium (soluble compounds)	---	0.1
Parathion (O, O-diethyl-O-p-nitrophenyl thiophosphate) - skin	---	0.1	Thiram (tetramethyl thiuram disulfide)	---	5
Pentachloronaphthalene - skin	---	0.5	Titanium dioxide	---	15
Pentachlorophenol - skin	---	0.5	Toluene (toluol)	200	750
Pentanone (methyl propyl ketone)	200	700	o-Toluidine - skin	5	22
			Tolylene-2,4-diisocyanate	0.02	0.14
			Trichloroethylene	100	520
			Trichloronaphthalene - skin	---	5
			* 1,1,2-Trichloro 1,2,2-tri-fluoroethane	1000	7600
			Triethylamine	25	100
			Trifluoromonobromomethane	1000	6100

III.

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Recommended Values (cont.)

Substance	PPM ^{2/}	Mg/M ³ #	Substance	PPM ^{2/}	Mg/M ³ #
Trinitrotoluene - skin	---	1.5	Vinyl chloride (chloro-ethylene)	500	1300
Triorthocresyl phosphate	---	0.1	Vinyl toluene	100	480
Triphenylphosphate	---	3	• Warfarin (3-[4-acetonylbenzyl]-4-hydroxycoumarin)	---	0.1
Turpentine	100	560	Yttrium	---	5
Uranium	---	0.05	Xylene (xylol)	200	870
(soluble compounds)	---	0.25	Xylidine - skin	5	25
(insoluble compounds)	---	0.5	• Zinc oxide fume	---	5
Vanadium	---	0.1	Zirconium compounds (as Zr)	---	5
(V ₂ O ₅ dust)	---				
(V ₂ O ₅ fume)	---				

Radioactivity: For permissible concentrations of radioisotopes in air, see U.S. Department of Commerce, National Bureau of Standards, Handbook 69, "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure", June 5, 1959. Also, see U.S. Department of Commerce, National Bureau of Standards, Handbook 59, "Permissible Dose from External Sources of Ionizing Radiation", September 24, 1954, and addendum of April 15, 1958.

Mineral Dusts

Substance	MPPCF ^{1/}	MPPCF ^{2/}
* Silica		
Crystalline		
Quartz, Threshold Limit calculated from the formula	250	
Cristobalite "	%SiO ₂ + 5	
Amorphous, including natural diatomaceous earth	20	
Silicates (less than 1% crystalline silica)		
Asbestos	5	
Mica	20	
Soapstone	20	
Talc	20	
Portland Cement	50	
Miscellaneous (less than 1% crystalline silica)		50
Note: The percent of crystalline silica in the above formula and tables is based on the amount found from an analysis of the air-borne dust.		
Conversion factors		
mppcf x 35.3 = million particles per cubic meter		
= particles per cc		

Tentative Values

Substance	PPM ^{2/}	Approx. Mg. ^{4/} per Cu. M.	Substance	PPM ^{2/}	Approx. Mg. ^{4/} per Cu. M.
• Benzidine	---	A ¹	Ketene	0.5	0.9
tert. Butyl chromate (as CrO ₃)	---	0.1	• B-Naphthylamine	---	A ²
• Campher	---	5	1-Nitropropane	25	90
Chlorobromomethane	200	1050	• N-Nitrosodimethylamine (Dimethylnitrosamine)	A ³	---
• Cobalt	---	0.5	• Oil (mineral)	---	5
DDVP (O, O-Dimethyl-2, 2-dichlorovinyl phosphate)	---	1	• Osmium tetroxide	---	0.002
Dimethyl acetamide - skin	10	35	Pentaborane	0.005	0.01
Endrin (1, 2, 3, 4, 10, 10-hexachloro-6, 7-epoxy-1, 4, 4a, 5, 6, 7, 8a-octa hydro 1, 4-endo-5, 8-dimethanonaphthalene)	---	0.25	• Perchloryl fluoride	3	13.5
• Epichlorohydrin	5	19	Phosdrin (2-carbomethoxy-1-methyl vinyl dimethyl phosphate)	---	0.1
Ethanolamine	0.5	1	• Platinum compounds (as Pt.)	---	0.002
Heptachlor (1, 4, 5, 6, 7, 8, 8-heptachloro-3a, 4, 7, 7a-tetrahydro-4, 7-methanoindene)	---	0.25	• Sulfuryl fluoride	5	20
			Systox	---	0.2
			2, 4, 5T (2, 4, 5-Trichlorophenoxyacetic acid)	---	10
			Teflon (®) decomposition prod.	---	A ⁴
			1, 2, 3-Trichloropropane	50	300

A¹ **Benzidine.** Because of high incidence of bladder tumors in man, any exposure, including skin to extremely hazardous.

A² **B-Naphthylamine.** Because of the extremely high incidence of bladder tumors in workers handling this compound, and the inability to control exposures, B-naphthylamine has been prohibited from manufacture, use and other activities that involve human contact by the State of Pennsylvania.

A³ **N-Nitrosodimethylamine.** Because of extremely high toxicity and presumed carcinogenic potential of this compound, contact by all routes should not be permitted.

A⁴ **Teflon (®) decomposition products.** At least one identified component of Teflon (®) decomposition products is extremely toxic, but in the absence of more complete toxicity information and suitable analytical methods, a definite threshold limit value is not recommended at this time.

Signed: Harry B. Ashe Bernard Grabois William F. Reindollar Herbert E. Steinkinger,
 E. J. Baier Wayland J. Hayes Russell G. Scovill Chairman
 Allan L. Coleman Keith Jacobson Ralph G. Smith
 Hervey B. Elkins Harold N. MacFarland Mitchell R. Zaven

INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

897 Hazards in Use of Closed Chest Cardiopulmonary Resuscitation.

Possible dangers in the indiscriminate use of the closed chest method of cardiopulmonary resuscitation have prompted the issuance of a joint statement by the Industrial Medical Association, the American Heart Association, and the American National Red Cross as a guide to the public regarding this new first aid technique which makes it possible to continue blood circulation without opening the chest. While acknowledging the usefulness of the closed chest method as a temporary medical procedure in certain cases of stoppage or disruption of heart beat, the statement stresses the importance of its application only in the hands of carefully trained personnel. The use of this method by untrained hands has been reported to have been responsible for a variety of injuries to patients, including damage to the heart and liver, internal bleeding, multiple rib fractures, and puncture of the lungs. The sponsoring organizations urge that emphasis be placed on training physicians, nurses, and specially qualified emergency rescue personnel so that the procedure may become more widely available.

898 Conference on Engineering in Biology and Medicine.

The 15th Annual Conference on Engineering in Biology and Medicine will be held at the Conrad Hilton Hotel in Chicago, November 4 to 7. Sponsors are the Institute of Electrical Engineers, and the Instrument Society of America. A commercial and scientific exhibit is planned. Send inquiries to: Professional Associates, 6520 Clayton Road, St. Louis 17, Missouri.

-- Chem. Eng. News

899 American Industrial Health Conference.

The 1963 American Industrial Health Conference will be held March 18 to 21 in Washington, D.C. The Conference is comprised of the annual meetings of the Industrial Medical Association and the American Association of Industrial Nurses. A multifarious program, featuring many of the nation's experts in the field of occupational health, will be announced at a later date. Further information may be obtained from the American Industrial Health Conference, 55 East Washington Street, Chicago 2, Illinois.

900 Mid-America Spectroscopy Symposium.

The 14th Annual Mid-America Spectroscopy Symposium, sponsored by the Chicago Section of the Society for Applied Spectroscopy in cooperation with 6 other Mid-America Sections, is to be held at the Sheraton-Chicago Hotel in Chicago, May 20-23. Original papers are invited from the fields of mass emission, x-ray, general absorption, infrared, NMR, EPR, Raman and flame spectroscopy, as well as gas chromatography. Absolute deadline for receipt of title and abstracts is January 15, 1963. The meeting will feature seminars, problem clinics and an instrument exhibit by leading manufacturers in the fields of spectroscopy and gas chromatography. Further information can be obtained from: John E. Forrette, Roy C. Ingersoll Research Center, Borg-Warner Corporation, Wolf and Algonquin Roads, Des Plaines, Illinois.

OCCUPATIONAL DISEASE STATISTICS

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

	<u>Colo.</u> <u>May-Aug.</u>	<u>Conn.</u> <u>July</u>	<u>Pa.</u> <u>Aug.-Sept.</u>	<u>Tenn.</u> <u>Aug.</u>	<u>Total</u>
Anthraco-silicosis			5		5
Asthma			1		1
Blood condition			1		1
Bronchiectasis					
(multiple irritants)		1			1
Brucellosis			1		1
Dermatitis	42	15*	32	15	104
Diseases from animals	3				3
Fumes (unidentified)			7		7
Iritis					
(multiple irritants)		1			1
Lead poisoning	1		4		5
Pneumoconiosis	5		81		86
Pneumoconiosis (suspected)			7		7
Pneumonitis (suspected)			2		2
Pneumonitis (gasoline)				1	1
Poisoning from metals	1				1
Poisoning by phosgene					
(very mild)		2			2
Poisoning from solvents	5				5
Respiratory infection			3		3
Silicosis	2		2		4
Silicosis (suspected)			8		8
Tuberculosis			2		2
Miscellaneous	9				9
Total	68	19	156	16	259

* Causes are listed as follows:

Connecticut: Occupational dermatitis due to plants, poison ivy 2; occupational dermatitis due to oils and greases (and metal cutting compounds) 2; occupational dermatitis due to solvents 3; occupational dermatitis due to other chemicals: hair spray 1, multiple chemicals 2, synthetic resins or resin (plastic) compounds 2, tar 1, undetermined 1; occupational dermatitis—other: soaps or detergents 1.

COMING EVENTS

- | | |
|--------------|--|
| 902 Nov. 1-3 | Natl. Society of Professional Engineers, Fall Meeting, Phoenix, Arizona. |
| Nov. 4 | Natl. Medical Foundation for Eye Care, Las Vegas, Nevada. |
| Nov. 5-7 | Natl. Fertilizer Solutions Association, Miami Beach, Florida. |
| Nov. 5-9 | The Metallurgical Society, AIME, Fall Meeting, Chicago, Illinois. |
| Nov. 8 | Synthetic Organic Chemical Manufacturers Association, New York, N. Y. |
| Nov. 8-10 | Gerontological Society, Inc., Miami Beach, Florida. |

Nov. 12-15	American Petroleum Institute, 42nd Annual Meeting, Chicago, Illinois.
Nov. 12-18	American Rocket Society, 17th Annual Meeting and Space Flight Exposition, Los Angeles, California.
Nov. 14-15	Society of Aerospace Material and Process Engineers, National Meeting and Symposium, Hollywood, California.
Nov. 15	National Industrial Conference Board, Chicago, Illinois.
Nov. 15-16	Armed Forces Chemical Assoc., 17th Annual Meeting, Washington, D.C.
Nov. 20	Manufacturing Chemists' Association, Midyear Meeting, New York, N.Y.
Nov. 24-25	American College of Chest Physicians (Interim Session), Los Angeles, Calif.
Nov. 25-28	American Medical Assoc., Clinical Meeting, Los Angeles, Calif.
Nov. 25-30	Radiological Society of North America, Inc., Chicago, Illinois.
Nov. 26-28	American Nuclear Society, Annual Winter Meeting, Washington, D.C.
Nov. 29-Dec. 2	American Medical Women's Assoc., Los Angeles, Calif.

LEGAL DEVELOPMENTS

903 To Extend Air Pollution Control Act.

A bill to extend the Air Pollution Control Act for 2 years has been approved by the House Commerce Committee. H.R. 12833 would extend the Act until June 30, 1966, and would require the Surgeon General to make a study of the effect of automobile exhaust fumes on the public health. A much stiffer bill (S. 455), which would extend the Act and give the Surgeon General authority to call conferences to settle regional air pollution problems, passed the Senate last year.

-- Chem. Eng. News

904 Cleveland has New Revised Air Pollution Code.

The Division of Air and Stream Pollution Control in the City of Cleveland has, after many months of councilmanic meetings (open to the public), passed a new and revised "Air Pollution Code" for the control of particulate emissions in the metallurgical industry and revised fly ash emissions from fuel burning equipment. The Code now contains statutory limitations of emissions from ferrous and non-ferrous foundries—the steel making industry—lowering the flyash particulate emissions from stacks of fuel burning equipment and flyash emissions operating within the limits of the City of Cleveland. Those industries operating at the time of the passage of the Code are given a grace period to conform, after having submitted to the Commissioner a schedule and program for conformance.

J. Air Poll. Control Association

905 California MVP Control Board Commended for Statement Regarding Diesel Engines.

The Automobile Manufacturers Association commended the California Motor Vehicle Pollution Control Board for clarifying the legal aspects of diesel engine crankcase ventilation. The California Board declared that diesels are exempt from provisions in the state law requiring positive crankcase ventilating systems on all new motor vehicles. As interpreted now, the California law will apply only to gasoline-powered cars and trucks. The AMA explained that engineering evidence has established that emissions from diesel engine crankcases are not a significant source of unburned hydrocarbons, believed to be a major contributor to California's photochemical smog. Motor vehicle manufacturers have conducted an intensive research and development program in the vehicle emission field since 1953 when such emissions first were linked with smog. The industry announced last December that all 1963 model gasoline-powered cars and trucks would be equipped with positive crankcase ventilation systems. Such devices have been installed as standard equipment on all gasoline-powered vehicles manufactured for sale in California since 1961.

-- J. Air Poll. Control Association

11 206 0697

BOOKS, PAMPHLETS AND NOTICES

- 906 Hazardous Chemicals Data. NFPA No. 49M. National Fire Protection Association. 78 pp. (1962). FOR SALE FROM: National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass. PRICE: \$1.00.

A newly revised edition of this pamphlet has just been issued by the National Fire Protection Association. A compilation of vital information on dangerous chemicals, the publication describes fire and explosion hazards, life hazards, recommended storage procedures, and fire fighting methods. The 1962 edition just released contains information on 20 chemicals not found in former editions, bringing to 98 the number of chemicals now listed. It also revises certain statements made in previous editions concerning recommendations for electrical equipment suitable for use in atmospheres of the particular chemicals under discussion. Widely referred to as a guide to good practice "Hazardous Chemical Data" was developed by the NFPA Sectional Committee on Properties of Hazardous Chemicals under the chairmanship of Thomas E. Duke of the Fire Prevention and Engineering Bureau of Texas. After approval by the parent committee, the NFPA Committee on Chemicals and Explosives, the present edition was adopted at the recent annual meeting of the National Fire Protection Association.

- 907 Control of Flammable Liquids and Gases in Manholes, Sewers, and Similar Underground Structures. NFPA No. 328M. National Fire Protection Association. 20 pp. (1962). FOR SALE FROM: National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass. PRICE: 50 cents.

A newly revised edition of this publication has recently been issued by the National Fire Protection Association. The purpose of this report is to give to enforcement officials, fire authorities, contractors and owners of underground structures guidance on problems involving flammable liquids and gases which may be found in underground structures. It was developed by the NFPA Sectional Committee on Maintenance and Repair under the chairmanship of T. H. Wright, of the Ohio Inspection Bureau, Columbus, approved by the NFPA Committee on Flammable Liquids and the NFPA Committee on Gases, and adopted at the recent annual meeting of the National Fire Protection Association.

- 908 Safety in Industry. Mechanical and Physical Hazards No. 4. Fire Protection for the Safety Man. Bulletin 232. U.S. Department of Labor, Bureau of Labor Standards. 25 pp. (1961). FOR SALE FROM: Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. PRICE: 25 cents.

This bulletin is intended to provide the safety man with the basic information which will be helpful in dealing with the hazards of fire. The bulletin recognizes that fire prevention is sometimes separate and apart from accident prevention, but property damage and personal injury are so closely related that the possibility of personal injury exists in most accidental fires involving property damage. The bulletin suggests 5 objectives with respect to fire protection as a means of preventing injury, and discusses each in detail. The 5 objectives are: prevent the outbreak of fire; provide for early detection; prevent its spread; provide for prompt extinguishment; and provide for the prompt and orderly evacuation of personnel.

- 11 206 0698

INDUSTRIAL MEDICAL PRACTICE

- 909 Work Limitations of the Pregnant Employee. W. J. Dignam.
J. Occ. Med. 4, 423-425 (Aug. 1962).

The author has considered some possible hazards to the fetus, such as maternal infections, hypoxia, radiation, and trauma. Some major changes in maternal physiology produced by pregnancy have been discussed, in order to point out which organ systems might be most susceptible to decompensation if the increased demands of pregnancy were added to those of industrial activity, or were made upon an organ the function of which had been compromised by industrial exposure to toxic substances.

-- Author's summary

- 910 Pathogenesis of Postnecrotic Cirrhosis in Alcoholics. E. Rubin, S. Krus and H. Popper.
Arch. Pathol. 73, 288 (1962).

To study the evolution and pathogenesis of postnecrotic cirrhosis in alcoholics, sections of liver taken at autopsy from 342 cases of portal and postnecrotic cirrhosis were examined. Of the 209 cases in which a definite history of alcoholism was obtained, 43% displayed the features of postnecrotic cirrhosis. The cases of portal cirrhosis were divided into groups on the basis of the commonly accepted sequences in progression. Features characteristic of alcoholic liver injury (fatty metamorphosis and hyaline bodies) and features of postnecrotic cirrhosis (collapse, multilobular nodules, and variation in nodular size) were rated in each case. Single features of postnecrotic cirrhosis were found in many cases of portal cirrhosis, and their incidence increased with the progression of the latter disease. Thus, in portal cirrhosis as the incidence of "alcoholic features" decreased, postnecrotic features increased, until a stage was reached which was difficult to distinguish from early postnecrotic cirrhosis and appeared intermediate. In addition, many of the cases of postnecrotic cirrhosis showed fatty metamorphosis and hyaline bodies. The findings of this study support the hypothesis that postnecrotic cirrhosis in alcoholics evolves from portal cirrhosis, and is the end-stage of a relentless, chronic, hyperplastic process characterized principally by nodular regeneration, as a response to continuing necrosis. On the basis of this data, it was suggested that postnecrotic cirrhosis be sub-classified as (a) the coarse nodular liver (grossly mis-shapen) with the commonly accepted etiology, and (b) cirrhosis with microscopic postnecrotic features in which chronic alcoholism must be added as an etiologic factor.

-- Can. Med. Assn. J. Abstr.

- 911 Misdiagnosis of Glaucoma. B. Schwartz. N. Y. State J. Med. 62, 1953 (June 15, 1962).

The various errors in diagnostic techniques which can lead to the diagnosis of glaucoma in a patient in whom glaucoma does not exist are reviewed. Correct diagnosis with the use of a Schiotz tonometer depends on reliability of the instrument, use of a correct calibration scale, and recognition of the error of reproducibility of tonometer readings. Misdiagnosis may be made on the basis of misinterpretation of the following: high normative ocular tensions, high ocular rigidity, changes of the disk and visual fields caused by other conditions, and apparently glaucomatous defects of visual fields with normal disks.

-- J. Am. Med. Assn. References & Reviews

- 912 The Asthma Problem: A Critical Analysis. O. Swineford, Jr.
Ann. Internal Med. 57, 144 (July 1962).

The incidence of asthma in the U. S. is estimated at nearly 4,500,000 victims. In spite of this, few physicians treat asthma with the same skill they employ in a host of less common disorders. The allergist provides marked relief to roughly 80% of asthmatics if he can see them early enough, but there are many clinical and pre-clinical deficits in existing knowledge of asthma. Diagrams list and illustrate the inter-relationships of these deficits.

-- J. Am. Med. Assn. References & Reviews

913 Prognosis of Pulmonary Sarcoidosis. C. Hoyle. Lancet 2, 7203 (1961).

There has been a wide discrepancy in the reported likelihood of improvement in pulmonary sarcoidosis, varying from 29 to 83%. In part, this variation is due to racial factors, Negroes having a notoriously low rate of improvement. Another important factor is the stage of the disease when observed. Prognosis appears to depend upon the existing types, defined by the authors as follows: (1) Benign with spontaneous resolution Hilar node enlargement with or without transient pulmonary infiltration (Results of x-ray examination may be expected to be normal within 2 years. There is no disability or mortality). (2) Chronic nonprogressive Hilar node enlargement which may or may not persist, but accompanied by pulmonary infiltration which persists but does not progress to destructive fibrosis (Disability is slight and prognosis good). (3) Chronic and progressive Severe lung fibrosis and destruction with eventual high mortality. The active course of the disease is short when erythema nodosum is the initial manifestation. Corticosteroids at present are the only remedy. Therapy in Type 1 is not needed, and is limited in Type 2. Type 3 must be treated if it is to be effective for many years.

-- J. Occ. Med. Absts.

914 Pulmonary Evaluation of Surgical Patients. M. Stein, et al.
J. Am. Med. Assn. 181, 765-770 (Sept. 1, 1962).

Three tests of pulmonary function were performed in 63 pre-operative patients selected at random from a ward service. Among 33 patients whose pre-operative pulmonary function was normal, there was one post-operative pulmonary complication; in 30 patients classified as abnormal, there were 21 complications. Decreased maximal expiratory flow rates had the best correlation with respiratory complications. Elevated alveolar carbon dioxide tension was of great significance, and the nitrogen meter single-breath test was also helpful. Location of the surgical incision and age of the patient were other important factors in determining the development of post-operative pulmonary complications. This study demonstrates that a few selected tests of pulmonary function can be helpful to the surgeon and anesthetist in the selection of patients for operation and in indicating the need for pre-operative and post-operative prophylactic measures.

-- Authors' abstr.

915 Do Heart Disease Patients Benefit from Work Recommendations?

W. L. Cook, Jr., W. B. Tuttle and D. Kodlin. J. Occ. Med. 4, 411-418 (Aug. 1962).

This study tried to answer the question: Do heart disease patients benefit from work recommendations? Information was assembled on 883 persons with arteriosclerotic or rheumatic heart disease who were evaluated and followed for a maximum of 10 years. Survival data were analyzed from the standpoint of the patient's compliance or disregard of work recommendations given by the Pittsburgh Cardiac Work Evaluation Clinic. Findings were as follows: (1) Rheumatic heart disease cases have a somewhat higher yearly mortality (7%) than arteriosclerotic heart disease cases (5%). (2) In the arteriosclerotic heart disease group, patients complying with the clinic recommendations hold an intermediate position as to mortality, the lowest mortality being observed among those doing less than recommended, the highest amongst those doing more. Patients who followed clinic advice by reducing activity survived longer than those who did not. (3) In the rheumatic heart disease group patients doing less than recommended had again the lowest mortality. Those who followed advice had the same mortality as those who exceeded. (4) Variables such as age, therapeutic classification on first clinic visit, and occupation apparently were not responsible for the mortality differences between compliance groups. (5) An effort was made to determine the effect of work prescription on the progress of heart disease. The data are not trustworthy because of possible observer bias. (6) A 10-year follow-up has produced an insufficient number of cases after breakdown into categories which appear to be sufficiently homogeneous to allow all possible survival comparisons between compliance groups. This is an indication that work evaluation clinics should consider pooling of results.

-- Cond. from authors' summary

11 206 0700

- 916 The Changing Outlook for the Hypertensive Patient. I. H. Page.
Ann. Internal Med. 57, 96 (July 1962).

The past 12 years have seen revolutionary changes in knowledge of arterial hypertension. These have occurred chiefly in 3 areas: first, recognition of the nature of hypertensive diseases as part of a group of diseases that might be called "diseases of regulation" in which the disease results from the inherited response of the body to its environment; second, recognition of the varied neural and chemical controls of arterial pressure and tissue perfusion; and, finally, demonstration that some forms of hypertension are reversible by use of antihypertension drugs and correction of disturbances in blood flow.

-- J. Am. Med. Assn. References & Reviews

- 917 Oral Manifestations of Human Nutritional Anemias. S. Dreizen.
Arch. Environmental Health 5, 66-75 (July 1962).

Degenerative and inflammatory changes in the soft structures of the oral cavity are among the most prominent clinical manifestations of the human nutritional anemias. In each, there is an impediment in the chain of enzyme reactions concerned with the metabolism and replacement of rapidly multiplying cells. Rapidity of cell replacement is a feature common to both the mucosal lining of the alimentary tract and the hematopoietic tissues. This common characteristic undoubtedly contributes to the frequently encountered symptomatic association between the mouth and the blood in periods of nutritional deprivation. -- Author's summary

- 918 The Effects of Smoking. E. C. Hammond. Sci. Am. 207, 39-59 (July 1962).
(Scientific American, Inc., 415 Madison Avenue, New York 17, N. Y. *).

New biological studies help to explain how tobacco smoke damages the lungs, heart, and other body tissues. Before 1914 tobacco had been consumed mainly in pipes, cigars, chewing tobacco and snuff. Cigarettes began to be popular during World War I. From the early 1920's to 1960, the consumption of manufactured cigarettes in the U.S. rose from approximately 750 per adult per year to 3,900 per adult per year. During the same period, the consumption of tobacco in all other forms declined about 70%. Studies have demonstrated that the increase in lung cancer is real and not attributable merely to improvement in diagnosis. Lung cancer increase seems to be confined to 2 closely related forms of the disease: adenocarcinoma and undifferentiated carcinoma. Results of studies comparing the smoking habits of cancer patients with the smoking habits of individuals free of the disease showed a larger percentage of cigarette smokers in the lung cancer group than in the control group. There is good reason to suppose that the composition of tobacco smoke, both qualitative and quantitative, is a matter of considerable importance. Extensive research should be undertaken to determine the effects of various constituents of cigarette smoke and to find means of removing those that are most harmful.

-- APCA Absts.

- 919 Carcinogenic Activity of Cigarette Smoke Condensate. Biological Activity of Refined Tar from Certain Brands of Cigarettes. F. C. Bock, et al.
J. Am. Med. Assn. 181, 668-673 (Aug. 25, 1962).

Cigarettes of 4 standard brands and 2 filter-tipped brands were smoked. The heptane-soluble fraction of tar from each brand was tested by painting mice with the equivalent of 8.3 cigarettes per day. Because the yield from the filter-tipped cigarettes was one-third as great as from the standard cigarettes, the filter-tipped treated mice received correspondingly less tar. Skin tumors were produced in 41 of 76 mice painted with tar from standard cigarettes and in 15 of 60 mice painted with the product from filter-tipped cigarettes. No significant difference was found among mice painted with tars from the 4 standard brands or between the 2 groups painted with filtered tar. In every group of mice, some of the skin tumors progressed to cancers within the 1-year period.

-- Authors' abst.

* Address not in current List of Periodicals.

11 206 0701

- 920 Smoking and Serologic Abnormalities. C. L. Heiskell, et al.
J. Am. Med. Assn. 181, 674-677 (Aug. 25, 1962).

The study determined, in an ambulatory population comprising 963 females and 549 males over 25 years of age, the relationship between smoking habits and serologic abnormalities as measured by the presence of C-reactive protein-CRP and an abnormal seroflocculant for ethyl cholelidenate-SF. When the effect of age was held constant, the correlation between the incidence of positive SF and CRP tests and increased cigarette consumption was significant in both male and female groups. When the effect of age was not held constant, a significant difference was observed between the frequency of positive SF tests among males who did not smoke and those who smoked cigarettes regardless of the number smoked. The only significant difference in frequency of positive CRP tests in males was observed between nonsmokers and those smoking more than 1 pack of cigarettes per day.

-- Authors' abstr.

- 921 An Experimental Study of the Pathological Effects of Cigarette Condensate in the Lungs with Special Reference to Carcinogenesis. J. W. S. Blacklock. Brit. J. Cancer 15, 745 (1961).

In the first 2 experiments to study the pathological effects of cigarette condensate the test material, diluted in eucrin, was injected directly into the lungs of rats, rabbits, and guinea pigs and the animals were killed at various intervals to determine the sequence of histological changes. In order of time the following were observed: proliferation of the basal cells of the bronchial epithelium, squamous metaplasia followed by hyperplasia, "carcinoma in situ", and finally squamous epithelioma; papillomas were also observed. In the second experiment, 72 rats similarly inoculated with condensate were allowed to live until death. Of these, 8 developed malignant lung tumors (6 carcinomas, 2 sarcomas) at the inoculation site. One sarcoma developed in a group of 44 rats injected with eucrin alone; and 4 tumors (1 carcinoma, 3 sarcomas) developed in the lungs of 275 uninjected control rats. In all groups most of the neoplasms occurred in animals over 18 months old; in the period up to 15 months old, only malignant tumors associated with the condensate occurred. The observations are discussed in terms of relationship between lung cancer and cigarette smoking and air pollution. It is suggested that after prolonged smoking the bronchial mucous membrane ceases to be able to expel particles by means of ciliary action; cigarette smoke and soot particles collect in the lungs, where they exert a weakly carcinogenic and a co-carcinogenic effect, respectively, leading to lung cancer.

-- J. Occ. Med. Abstrs.

- 922 Tobacco Smoking and Ventilatory Function of the Lung. J. Read and T. Selby.
Brit. Med. J. No. 5260, 1104-1108 (Oct. 28, 1961).

Ventilatory capacity has been assessed in 302 subjects in Sidney, Australia in relation to smoking habits and respiratory symptoms. Among males, smoking in the absence of symptoms leads to some reduction of ventilatory capacity. The presence of cough, or cough and sputum, is associated with further impairment of ventilatory function. These same symptoms are associated with loss of ventilatory capacity among nonsmokers. Ventilatory loss appears to be largely reversible in those who cease smoking. Among females there are similar trends, but the results are not apparently explicable on the basis of a simple quantitative effect of smoking on the bronchial mucosa. As an alternative, a hypothesis is offered based on a combination of genetic and environmental factors, and this is supported by the present findings.

-- Am. Rev. Resp. Dis. Abstrs.

- 923 A Survey of 372 Patients Operated on for Lung Cancer. J. M. Reid, et al.
Scot. Med. J. 6, 443-448 (Oct. 1961). (Scottish Medical Journal, 5 St. Vincent Place, Glasgow G2, Scotland *).

Between 1953 and 1960, 372 patients were treated surgically for lung cancer. This, however, is a highly selected group, because only more hopeful cases are referred for surgical treatment and even in this instance the 372 patients were selected from 855 patients seen at the unit. There were 58 operative deaths. Of the 127 patients who have been followed up for 5 years, 15 survived (12% of all patients operated on). No regional lymph node involvement was present at operation in 13 of these 15 cases.

-- Am. Rev. Resp. Dis. Abstrs.

* Address not in current List of Periodicals.

- 924 Staphylococcal Wound Infection. G. W. Taylor, et al. Brit. J. Surg. 49, 569 (1962).
(British Journal of Surgery, John Wright and Sons, Ltd., Bristol 8, England*).

An experimental study was undertaken on guinea pigs to elucidate the routes by which staphylococci may infect operative wounds. Known numbers of a single strain of staphylococcus aureus were inoculated into fresh wounds and the incidence of suppuration was determined under several circumstances. Other workers have established that in order to cause an infection in man by intradermal injection, 1 to 5 million staphylococci are required, but when the injection is introduced on a suture only 100 to 10,000 organisms were necessary. In guinea pigs large inocula of staphylococci did not cause suppuration, but if they were introduced on a suture or dropped into a fresh wound, as few as 50 to 100 caused infection. Starvation for 24 hours pre-operatively did not influence the number of infections. Drying the infected suture for 4 hours did not affect the incidence of infection, but drying for 24 to 48 hours lessened it. The effect of drying was nullified by inoculating the suture with a much larger dose of bacteria.

-- Can. Med. Assn. J. Absts.

- 925 Office Management of Common Medical Conditions. R. E. Rockney.
J. Occ. Med. 4, 419-422 (Aug. 1962).

Minor medical conditions comprise the bulk of any office or dispensary practice. Minor medical conditions refer to a large group of complaints which are, as a rule, self-limiting and do not pose a serious threat to the patient's life. This gives any doctor who has a modicum of therapeutic authority at least an 80% chance of success in the practice of medicine. These conditions are a real challenge to the physician only in terms of the serious illness which they may be announcing. It is the case of indigestion that turns out to be carcinoma of the stomach, the chronic fatigue which turns out to be leukemia, or the diarrhea which turns out to be lupus erythematosus which requires that the physician be continually on his guard so that he may pick out the 1 in 100 who in truth has a life-threatening disease. The author discusses briefly the following medical conditions: fatigue, upper respiratory infections, diarrhea, headache, dysmenorrhea, myocardial infarction, and cerebral vascular accidents.

SKIN DISEASES AND BURNS

- 926 Incidence and Bacteriology of Erythrasma. I. Sarkany, D. Taplin and H. Blank.
Arch. Dermatol. 85, 578 (1962).

Erythrasma is a superficial fungus disease occurring in the groins, axillae and toe webs due to a diphtheroid member of the genus *Corynebacterium*. The authors report an incidence of from 3 to 25%, the toe webs being most commonly affected. Extensive cases are very unusual in temperate climates. The condition may be asymptomatic. The clinical diagnosis can be confirmed by examination of epidermal scrapings using the oil immersion microscope lens by culture in special media and by the appearance of a red fluorescence under ultraviolet light. Treatment by systemic erythromycin is reported to be very effective.

-- Can. Med. Assn. J. Absts.

- 927 Flavin Nucleotide Metabolism in Experimental Burns. C. J. Koehn.
Ann. Surg. 156, 268 (Aug. 1962).

Riboflavin is part of the prosthetic group of enzymes involved in the metabolism of protein, and its metabolism in burn injury may be expected to be altered. To test this hypothesis, rats were given a ration which produced half-saturation of liver riboflavin content. The rats were then subjected to a burning procedure which produced a third-degree burn of 20% of the body surface and has been shown to cause a marked negative nitrogen balance. The rats were killed at 3,

* Address not in current List of Periodicals.

6, 9, and 15-day postburn intervals, and the livers were analyzed for riboflavin, flavin mononucleotide, and flavin-adenine dinucleotide. In no instance was there any difference in the quantity of riboflavin or its nucleotides in the livers of burned or unburned rats or the relative proportions of riboflavin mononucleotide, or flavin-adenine dinucleotide. This indicates that the net quantities of flavonucleotides in the livers of rats are not altered as a result of burning.

-- J. Am. Med. Assn. References & Reviews

928 Primary Herpes Simplex Infection of Fingers of Medical Personnel.

G. W. Humbrick, Jr., R. P. Cox and J. R. Senior. Arch. Dermatol. 85, 583 (1962).

The authors report 6 nurses and resident hospital physicians who developed painful, localized vesiculo-bullous lesions on the fingers after giving medical care to the mouth or respiratory tracts of patients with or without clinical herpes simplex infection. In addition to the local lesions, regional lymphadenopathy fever, malaise and fatigability were also noted. The incubation period was 5 days. The course of the disease extended over a period of 2 1/2 to 3 weeks. Diagnosis was confirmed by isolating the virus, by showing the characteristic viral multinucleated epidermal cell by smear or biopsy, and by demonstrating a four-fold increase in the circulating herpes simplex antibody. The differential diagnosis included recurrent herpes simplex infections, herpes zoster and paronychia caused by staphylococci or Candida albicans. The authors point out that primary herpes simplex infections of the fingers may be more common than hitherto realized.

-- Can. Med. Assn. J. Absts.

929 The Occupational Toxicity of Cultivated Flowers. C. P. McCord.

Ind. Med. & Surg. 31, 365-368 (Aug. 1962).

In the United States approximately 600 botanical plants possess properties harmful to higher animal life. These include trees, shrubs, vines, cultivated crops, noxious weeds, decorative plants, and flowers. Those flowering and decorative plants handled by the florist or trade flower gardener conducive to occupational damage have been segregated, but any such listing must be regarded as incomplete. Eighty-six plants have been listed in this category. Almost exclusively the damage encountered is dermatitis, either from direct irritation or sensitization. More significant to the florist or gardener than his cultivated products are the inevitable exposures to noxious weeds and pesticides.

-- Author's summary

930 Control Operation: Epoxy Resin Dermatitis. D. J. Birmingham.

Safety Maint. 124, 44-46 (Sept. 1962).

The author recommends the following suggestions for the control of epoxy dermatitis: (1) All supervisors and workmen should be instructed thoroughly about the hazards involved in use of epoxy resins and the importance of avoiding contact. (2) The mixing, molding, curing, and tooling of the resins should be done in an isolated area of the plant, to avoid contamination of other areas and employees. (3) Batch mixing of the resin and hardener should be done under a ventilated hood to control the escape of vapors. Only a few workers should be permitted to do the batch mixing. (4) During molding operations, skin contact can be avoided by wearing protective sleeves and cotton-lined rubber gloves. Clean uniforms should be furnished and changed each day if necessary. (5) Acetone or related solvents are not to be used to cleanse the skin. (6) Tables, machinery, tools, floors, walls, and windows must be kept free of the fiberglass spicules and resinous dusts. The tables can be kept clean by using disposable heavy paper. (7) Clean-up rags should be replaced by disposable paper towels. (8) Grinding, sawing, drilling, or polishing the molded laminates should be done under ventilated hoods which remove all dusts from the breathing area and minimize the problem of skin contact. (9) Accidental spills of the resin or catalyst should be washed from the sites as soon as possible by using mild soaps in warm water dispensed at conveniently located wash stations. (10) Neutral or acid soaps should be used in preference to alkaline, powdered, or abrasive cleaning agents. (11) Water-soluble skin-protective gels which are neutral in their pH provide some help in protecting against the action of the solvents.

11 206 0704

CHEMICAL HAZARDS

- 931 Experiments on the Carcinogenicity and Reactivity of beta-Propiolactone. C. E. Searle. Brit. J. Cancer 15, 804 (1961).

Twice-weekly, applications of beta-propiolactone in purified acetone to the backs of albino mice induced papillomas and squamous cell carcinomas in about half the animals. On the theory that the carcinogenicity of beta-propiolactone is associated with alkylation of the 2-carboxyethyl group, it was thought that beta- (or 3-) bromopropionic acid, which reacts with cysteine at pH 6-7 to give S-2-carboxyethyl cysteine, might also have carcinogenic activity, but repeated applications to mouse skin failed to induce tumors. Although beta-propiolactone has a considerably weaker carcinogenic activity than the known carcinogenic polycyclic aromatic hydrocarbons, it is still advisable to limit human contact with this lactone as much as possible. Reactions of the lactone with cysteine and cystine in protein combination are discussed.

-- J. Occ. Med. Absts.

- 932 Hydrocyanic Acid Poisoning in a Tobacco Warehouse. D. Bernstein and M. Avital. Harefuah 62, 165-167 (Mar. 1, 1962). Hebrew. (Harefuah, Domus Medica, 1 J. Heftman St. Tel-Aviv, Israel*).

An outbreak of hydrocyanic acid poisoning by inhalation, 5 days after fumigation in a tobacco warehouse involved 35 female and 11 male workers. The gas was apparently trapped inside the loose bales of dried tobacco leaves. None of the cases was severe and all recovered. As the exposure was mostly not more than 5-15 minutes and was simultaneous, the situation is comparable to that of an exposure chamber experiment. The distribution of symptoms permits the assumption of a concentration of 45-54 parts per million parts of air. The presence of hydrocyanic acid in the air was ascertained by means of paper strips soaked in a solution of benzoic acetate and copper acetate.

-- Bull. Hyg.

- 933 The Toxicity of Fluorocarbons with Special Reference to Chemical Constitution. J. W. Clayton, Jr. J. Occ. Med. 4, 262-273 (May 1962).

The objective of this paper is to consider the relationship between the chemical composition of the fluorocarbons and their toxicity to mammals. This is not an exhaustive treatment, but rather a balanced discussion of the subject. From it further routes of investigation may be suggested and some general principles may emerge. Somewhat paradoxically, the fluorocarbons are considered to be among the most highly toxic substances known and yet among the most physiologically inert of materials. A closer look at the data reveals that the fluorochemicals run the gamut from highly toxic through intermediate stages to compounds of low toxicity. As a matter of fact, because of the nature of the carbon-to-fluorine bond, it may seem inconsistent that the fluorocarbons, noted for their chemical and thermal stability, can be quite highly toxic. The subject is discussed under the following subheadings: monofluorinated compounds, polyfluorinated compounds, fluoromethanes, fluoroethanes, fluoropropanes, fluorobutanes, fluoroalkanes-biologic activity, fluoroalkenes, fluoropolymers, fluoroalcohols, N-F compounds, and S-F compounds. There are 30 references in the bibliography.

- 934 Hydrogen Sulfide Intoxication. Review of the Literature and Report of Unusual Accident Resulting in Two Cases of Nonfatal Poisoning. T. H. Milby. J. Occ. Med. 4, 431-437 (Aug. 1962).

Two cases of nonfatal systemic hydrogen sulfide poisoning are discussed. Both cases resulted from an attempt to dispose of an inoperative cylinder of hydrogen sulfide gas by perforating its side with a heavy-caliber rifle bullet. One rescuer was overcome by the gas when

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he attempted to give mouth-to-mouth resuscitation to one of the apneic victims. It is not believed, however, that this technique is contraindicated in cases of toxic gas exposure; however, care should be taken to remove the victim from the area of contamination before resuscitation is started. Artificial respiration must begin immediately for victims of hydrogen sulfide who are in respiratory failure. This can be done effectively only by personnel who are "on the spot" and who are trained in accepted techniques. Follow-up care is supportive in nature. There are 25 references in the bibliography.

-- Cond. from author's summary

- 935 Effects of Acute Controlled Exposure to SO₂ on Respiratory Mechanics in Healthy Male Adults. N. R. Frank, et al. *J. Appl. Physiol.* 17, 252-258 (Mar. 1962).

Eleven healthy, adult, male volunteers were exposed on separate occasions to average levels of sulfur dioxide of 1, 5, and 13 ppm. The subjects were seated in a body plethysmograph, breathing spontaneously by mouth while measurements were made with an esophageal catheter. Exposures lasted 10-30 minutes, and, for each subject were spaced at least 1 month apart. With one exception the group showed no significant increase in pulmonary flow resistance at the lowest concentration of gas. At both 5 and 13 ppm, flow resistance was elevated, the change being greater at 13 ppm. The change occurred within 1 minute of exposure, increased after 5 minutes but, on the average, showed no further change after 10 minutes. Four subjects were exposed to 5 or 13 ppm of SO₂ for 30 minutes without exhibiting increases in flow resistance beyond the first 10 minutes. There were no consistent changes in pulmonary compliance, tidal volume, breathing frequency, or pulse rate. The functional residual capacity increased slightly during exposure to 13 ppm.

-- Bull. Hyg.

- 936 Cadmium as a Carcinogen. J. C. Heath, et al. *Nature* 193, 592 (1962).

The carcinogenic activity of cadmium metal powder has been studied by injecting two groups of 10 rats with 28 and 14 mg., respectively. Severe inflammation was always noted 3 days after injection of the material (in fowl serum) into thigh muscle. Histological examination of tumors, observed in animals sacrificed at 23, 24, and 28 weeks, showed them to be mainly rhabdomyosarcomas, although in two there was much collagen and evidence of fibrosarcomatous change; in one there was a large area of fairly well-differentiated fibrosarcoma, as well as regions of spindle-cell sarcoma. These rhabdomyosarcomas differ from those produced by cobalt metal powder in being far more differentiated; in general there were more mitoses than in cobalt-induced tumors.

-- J. Occ. Med. Absts.

- 937 Chromyl Chloride—A Possibly Important Industrial Air Contaminant.

W. H. Hill and F. X. Worden. *Am. Ind. Hyg. Assn. J.* 23, 186-193 (May-June 1962).

This paper discusses some of the parameters of the formation of chromyl chloride from solutions containing chloride and chromate ions, sulfuric acid and water. It points out that anhydrous conditions are not a necessary requisite for its formation, and that it does not hydrolyze as readily as is usually assumed to be the case. Work on the problem of analyzing gaseous media for chromyl chloride is reported, and the results of a study of its formation in an industrial establishment are discussed. The possibility is suggested that chromyl chloride may play an important role in the formation of lung cancer in chromate workers.

-- Authors' abst.

- 938 The Question of Saturnism Affecting the Central Nervous System and the Visual Apparatus.

Z. Falkowska, et al. *Arch. maladies profess.* 22, 759-761 (Dec. 1961). French.

The argument for and against the theory that lead is an etiological factor in disseminated sclerosis is mentioned after diffuse neurological signs are described in 22 patients, 18 of whom were referred for lead poisoning to the occupational diseases clinic in Warsaw. Another had retrobulbar neuritis, and 3 were referred for disseminated sclerosis, and lead intoxication was found during investigation. All 22 were chauffeurs, and in Poland the petrol contains much tetraethyl lead. The neurological picture was one of multiple lesions of the pyramidal system and cerebellum and occasionally of the extra-pyramidal system. On the basis of the findings the

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authors are not prepared to decide. However, the first neurological signs to appear were most often those of demyelination. The visual changes pointed to a toxic lesion of the whole retina, progressing slowly, often unnoticed by the patient until the peripheral visual fields had diminished considerably, e.g., with visual acuity of 6/24-6/36, fields were already limited to 20°-30°. There were changes in color vision, but few fundal changes were seen. This is unlike the sudden visual changes and remissions of disseminated sclerosis.

-- Bull. Hyg.

- 939 The Interpretation of Erythrocyte Stippling in Lead Workers. G. Meachim.
Am. Ind. Hyg. Assn. J. 23, 245-248 (May-June 1962).

Repeated stippled cell counts have been made on 40 lead workers. The blood films were stained with methylene blue and examined by transmitted light. The results are expressed as the estimated number of stippled cells in one million red cells. The counts obtained in 4 men with symptoms of lead toxicity were compared with the range of counts found in 36 men who remained healthy in spite of exposure to a comparable risk. The average of the mean counts for the poisoned men (2417 stippled cells per million) was higher than the average of the mean counts for the healthy group (244 stippled cells per million). The development of toxic symptoms was accompanied by an upward trend in the counts; a persistent upward trend was not noted in any of the healthy men. Only a small proportion (3 out of 36) of the healthy workers gave any counts increased to within the range found in the poisoned men, although occasional slight stippling was a common finding in the healthy group. Owing to individual variation in susceptibility to the toxic action of lead, it is not possible to set down a level at which increased stippling becomes "diagnostic" of lead poisoning. However, it is suggested that a count above 2000 stippled cells per million with the technique used indicates high lead absorption. In a susceptible individual this degree of absorption can well be associated with the development of toxic symptoms.

-- Author's summary

- 940 Lead Poisoning and Hemoglobin Synthesis: Report of Study of Fifteen Patients with Chronic Lead Intoxication. J. D. Boyett and C. E. Butterworth, Jr.
Am. J. Med. 32, 884 (June 1962).

Persons making whisky illegally frequently utilize automobile radiators as part of their distillation apparatus; as a result their product has sometimes contained lead, and chronic ingestion of "moonshine" whisky may result in lead intoxication. One of the many manifestations of lead poisoning is anemia, and it is this aspect which prompted the investigation of certain aspects of ferrokinetics in 15 patients with chronic lead intoxication, in all but one of whom it developed as the result of the ingestion of "moonshine" whisky containing lead. The diagnosis of lead intoxication was confirmed in all these patients by the following tests: (1) The examination of the peripheral blood for basophilic stippling; (2) the examination of a bone marrow aspirate; and (3) the determination of the 24-hour lead excretion. In summarizing the results of studies on ferrokinetics in the men with lead intoxication, the authors state that the rate of excretion of coproporphyrin, uroporphyrin, and delta-amino levulinic acid was high in all 5 patients so studied, and in these the rate of excretion of porphobilinogen was normal. The rate of disappearance of radioiron from the plasma of the entire group was essentially normal. The uptake of radioiron by the "erythron" was normal in 8 of 10 subjects studied. These in vivo studies are in accord with previous in vitro observations which have indicated no alteration in transport or cellular uptake of iron in lead poisoning. It is suggested that the findings reflect not only improper synthesis of porphobilinogen from delta-amino levulinic acid but also impaired production of heme from protoporphyrin and iron.

-- J. Am. Med. Assn. References & Reviews

- 941 Consequences of Ethylene Glycol Poisoning: Report of Four Cases and Review of Literature. E. A. Friedman, et al. Am. J. Med. 32, 891 (June 1962).

Sixteen high school students inadvertently consumed small quantities of antifreeze which had been placed for storage in a liquor bottle. Approximately 23 oz. (about 600 cc.) of "Marvel" brand antifreeze mixed with water or gingerale were consumed in amounts varying from a sip to about 40 oz. (about 120 cc.) The clinical histories of 4 of the students, of whom 2 died, are presented. These cases illustrate the high toxicity of ethylene glycol for even the healthy young adult. Three stages can be observed in the clinical course of ethylene glycol

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poisoning. The first stage is that of central nervous system involvement with symptoms manifest from 30 minutes to 12 hours after ingestion. The second stage is that of cardiopulmonary symptoms with rapidly progressive tachypnea, cyanosis, pulmonary edema, and death between the first and third day. Should the patient survive the first 2 stages, the renal phase predominates. The findings on microscopic examination of the kidney, when viewed in relationship to the clinical observations are pathognomonic. Changes in the glomerular tuft may be the basis for the findings in the urine in the initial phase of the clinical picture of ethylene glycol poisoning. The myocardial lesions found may explain the cardiopulmonary symptoms noted during the early phase. Tenderness of the muscles may occur on the basis of a myositis, as noted in the 2 fatal cases. The central nervous system disturbances, which are the first to appear, have anatomic correlates only in that calcium oxalate crystals are demonstrable. The toxicity of ethylene glycol is probably related to the intermediary metabolites as well as to the end product, oxalic acid. Early therapy consists of correction of the acidosis; later treatment is concerned with the careful management of renal failure.

-- Cond. from J. Am. Med. Assn. References & Reviews

- 942 Methyl Alcohol Poisoning. K. Kaplan. Am. J. Med. Sci. 244, 170 (Aug. 1962).

The clinical course of 4 men who drank commercial duplicating fluid containing 40% to 60% methyl alcohol and 35% to 55% ethyl alcohol is described. Outstanding clinical features of methyl alcohol poisoning are delay in onset of symptoms, high incidence of gastrointestinal and visual complaints, and variable neurological abnormalities. The treatment consists of correcting acidosis and removing methanol from the patient. Because of detectable blood ethanol after methanol had been metabolized, it is suggested that ethanol may have limited use as an adjunct to therapy.

-- J. Am. Med. Assn. References & Reviews

- 943 Hepatotoxicity Due to Ethionamide. T. S. Moulding, Jr. and S. Goldstein. Am. Rev. Resp. Dis. 86, 252-255 (Aug. 1962).

Clinical trials with the nicotinic acid derivative, alpha-ethyl-thioisonicotinamide (ethionamide) were first reported by Broquet and associates in 1958, and subsequent experience has confirmed it to be a useful antituberculosis drug. Adverse side effects have included abdominal pain, nausea, vomiting, peripheral neuritis, stomatitis, sialorrhea, mental disturbance, gynecomastia, and in a few instances jaundice. In the present paper the authors report a case of jaundice which occurred in a 37-year-old male diabetic during the administration of ethionamide. Hepatic abnormalities disappeared with cessation of therapy and recurred with rechallenge. This is the fourth reported instance of this complication.

- 944 Serum Glutamic Oxaloacetic Transaminase Elevation and Possible Hepatotoxicity Accompanying the Administration of Ethionamide. S. Phillips and R. D. Trevathan. Am. Rev. Resp. Dis. 86, 268-269 (Aug. 1962).

Two cases are reported in which the use of ethionamide and kanamycin resulted in elevation of serum glutamic oxaloacetic transaminase levels. In one there was also elevation of the serum bilirubin and sulfobromophthalin retention. Pending clarification of these hepatotoxic effects, it is urged that appropriate liver function tests be done prior to, during, and following ethionamide therapy.

-- Authors' summary

- 945 Benzol Myelopathy. H. Ludwig and A. Werthemann. Schweiz. med. Wochschr. 92, 378-384 (Mar. 31, 1962). German.

Two of 44 workmen in 2 chemical factories where the air contained benzene and toluene vapors for several hours each day, fell ill after a period of 14 and 19 years' activity. Both exhibited severe panmyelopathy. In one case, myeloid leukemia occurred. In the other case immature cells of the blood forming system were found in the blood and autopsy revealed a myeloid reaction of the bone marrow with tumor-like reticulosis. The head of the laboratory fell ill after only 11 years and died from severe panmyelopathy in less than one year.

-- Bull. Hyg.

- 946 Inhalation Studies with Chloracetophenone, Diphenylaminochloroarsine, and Pelargonic Morpholide. I. Animal Exposures. C. L. Punte, et al.
Am. Ind. Hyg. Assn. J. 23, 194-198 (May-June 1962).

Acute toxicity studies in rats, mice, and guinea pigs indicate that chloracetophenone, diphenylaminochloroarsine, and pelargonic morpholide are slightly to moderately toxic materials. The signs of intoxication observed in the animals during the exposure to these compounds were salivation, lacrimation, lethargy, and labored breathing. Histopathological examination of animals sacrificed or dying during exposure revealed no findings below an inhaled dose of 1000 mg. -min./cu.m. of chloracetophenone, 500 mg. -min./cu.m. of diphenylaminochloroarsine, and 5000 mg. -min./cu.m. of pelargonic morpholide.

- II. Human Exposures. C. L. Punte, et al.
Am. Ind. Hyg. Assn. J. 23, 199-202 (May-June 1962).

Human subjects have been exposed to chloracetophenone, diphenylaminochloroarsine, and pelargonic morpholide aerosols in various airborne concentrations below the maximum safe inhaled doses for man as established from animal toxicity determinations. These are 350, 100, and 500 mg. -min./cu.m. for chloracetophenone, diphenylaminochloroarsine, and pelargonic morpholide, respectively. The studies indicate that these compounds are relatively nontoxic but are highly irritating to both the eyes and respiratory tract. On the basis of response of the subjects exposed to the airborne concentrations the irritancy index was: pelargonic morpholide > diphenylaminochloroarsine > chloracetophenone. The recovery index was: pelargonic morpholide > chloracetophenone > diphenylaminochloroarsine.
-- Authors' abst.

- 947 Toxicity of Ingested Hexachlorophene. J. B. Wear, Jr., R. Shanahan and R. K. Ratliff.
J. Am. Med. Assn. 181, 587-589 (Aug. 18, 1962).

The accidental ingestion of a preparation containing hexachlorophene (pHisoHex) has been encountered in 10 patients. In most instances the suspension containing it was mistaken for milk of magnesia. This occurred because the disinfectant (meant to be used as a preoperative scrub) was dispensed in a paper cup, without adequate instructions and supervision by the nurse, and because the suspension resembles milk of magnesia in color and viscosity. The major symptoms of toxicity were anorexia, nausea, vomiting, abdominal cramps, and diarrhea. Dehydration was sometimes severe and associated with shock. The water and electrolyte derangement must be treated vigorously. Hexachlorophene is believed to be the primary factor in causing the toxicity. The theoretically fatal dose of hexachlorophene is 2 to 10 g. and is contained in 67 to 300 cc. of the preparation used.
-- Authors' abst.

- 948 Organic Phosphorus Poisoning and Its Therapy. With Special Reference to Modes of Action and Compounds That Reactivate Inhibited Cholinesterase. W. F. Durham and W. J. Hayes, Jr.
Arch. Environmental Health 5, 21-47 (July 1962).

Organic phosphorus compounds are of considerable interest and importance by virtue of their widespread use as insecticides; their effectiveness in the treatment of myasthenia gravis, glaucoma, and abdominal distention; and their potential application as war gases. These compounds owe their pharmacologic effect primarily, if not entirely, to their ability to inhibit the enzyme cholinesterase with resultant overstimulation of the parasympathetic nervous system by the acetylcholine which accumulates. Atropine has been the drug of choice for the treatment of organophosphorus poisoning. This therapy produces relief of symptoms based on blocking the action of excess acetylcholine. More recently, a number of specific antidotes have been developed which act to repair the basic biochemical lesion in organic phosphorus poisoning by freeing the cholinesterase from its combination with the inhibitor. In the present paper, some of the pertinent background material relative to organic phosphorus poisoning are reviewed, and the properties and usage of these specific antidotes are discussed in some detail. Emphasis is given to those aspects of symptomatology and treatment which might be of most value to the physician faced with a presumptive case of poisoning. There are 160 references in the bibliography.

-- Authors' introduction

- 949 Poisoning by Organophosphorus Insecticides, Especially Phosdrin. H. Van Raalte.
Arch. maladies profess. 23, 132-137 (Mar. 1962). French.

A comparison is made between phosdrin and parathion which are both organophosphorus compounds used as insecticides. Phosdrin is soluble in both water and lipids, making it rapidly transported in the body after absorption. It is a direct inhibitor of cholinesterase and reacts to form the labile dimethoxy phosphorvlated cholinesterase. For these reasons, phosdrin poisoning in contrast to parathion poisoning comes on rapidly after exposure, soon reaches its crisis and recovery is correspondingly fast. Atropine must be given immediately poisoning is suspected and the need for oxime therapy in human poisoning has not yet arisen. -- Bull. Hyg.

INDUSTRIAL DUSTS

- 950 The Basic Pathology of Pneumoconiosis. P. Gross. J. Occ. Med. 4, 485-487 (Sept. 1962). Reprints available from Industrial Hygiene Foundation upon request.

Pneumoconiosis is defined as the deposition of dust in the lungs. Deposits form in the lung as the result of a cellular reaction of the alveolar membrane to dust particles. This reaction may be focal or diffuse, noncollagenous and cellular, collagenous and acellular, or a mixture of these. The term pneumoconiosis should not be used to imply the existence of conditions other than the presence of pulmonary dust-deposits. Specifically, it should not be used to imply the presence of tuberculosis, chronic bronchitis, or emphysema. Definitive diagnostic terms should be used to identify the type of pneumoconiosis present and the nature of any additional complicating condition which may be present. Nor should the term pneumoconiosis be restricted to only those cases in which pulmonary dust-deposits have given rise to clinical symptoms or have become radiologically manifest; the term should be applicable to all cases in which pulmonary dust deposits exist. -- Author's summary

- 951 The Action of Phenylbutazon in the Development of Collagenous Nodules after Intratracheal Application of Quartz Dust. H. W. Schlipkoter.
Zentr. Biol. Aerosol Forsch. 10, 122-128 (Jan. 1962). German.

Groups of rats were subjected to intratracheal applications of 50 mg. each of quartz dust. One of the groups was also given, for 3 hours daily and 5 days a week, an aerosol of a 2% solution of phenylbutazon, as a solution of the sodium salt. This was later changed to a 1% solution and continued for 9 months. The animals were killed every 3 months and histological examinations were made of the lung tissue, especially of the degree of fibrosis and of the content of oxyproline. At 9 months, there was evidence of retardation of fibrosis and reduction in content of oxyproline in the aerosol-treated group, but at 12 months there was little difference in the 2 groups. -- APCA Absts.

- 952 Nutrition and Pneumoconiosis in Miners. M. Neradilova.
Rev. Czechoslovak Med. (Prague) 7, 271-277 (1961). (Review of Czechoslovak Medicine, Czechoslovak Medical Society, J. E. Purkyne, Na Cvicisti 2, Prague 6, Czech. *).

This investigation of the possible influence of a high fat diet on the development of pneumoconiosis consisted first of the study of 2 groups of Ostrava miners, one group having x-ray signs of pneumoconiosis, the other group free of such signs. It proved impossible to find a correlation between the amount of ingested fat and the clinical pulmonary findings as all the miners, regardless of pneumoconiosis, had an enormous fat consumption. The large fat intake had no unfavorable effect in any way. The second part of this investigation was to produce silicosis in rats, which had been on a high fat diet, by continuous exposure to dust and some animals

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by intratracheal injection. Chvapil found that rats on a high fat diet had a high rate of proliferation of fibrous tissue after intratracheal injection. The results of the present experiment with intratracheal injection agreed with those of Chvapil. The animals exposed continuously to the inhalation of dust showed a greater transportation of dust by the lymphatics, and thus a reduction of the fibrosis in the lung tissue. The method of administration of the dust is probably the cause of the difference in the results. The intratracheal method is not suitable for this type of investigation.

-- Bull. Hyg.

- 953 A Study of the Airborne Dust in Hematite Mines in Cumberland. F. Bradshaw, A. Critchlow and G. S. Nagelschmidt. *Ann. Occ. Hyg.* (London) 4, 265-273 (Feb. 1962).

Before 1937 energetic efforts were made to introduce effective dust control and medical control in the hematite mines of Cumberland and there seems to be no evidence that men who entered the industry after that time have been disabled by pneumoconiosis. It appeared desirable to measure dust concentrations in this apparently safe mining industry, and such measurements were made in 1959 and 1960. Dust concentrations associated with various activities were measured. Sampling was done with the thermal precipitator and the Hexhlet gravimetric sampler. During filling operations the average count of particles from 0.5 to 5 microns in size was 250 per cc. of air, with a range of 100 to 500. During drilling the average count was 450 particles per cc. with a range of 400 to 500. The average for drilling and filling was 350 particles per cc. The average mass concentrations was 0.7 mg. per cu. m. during filling and 3.5 mg. during drilling. Some of the Hexhlet samples were examined by partial chemical and x-ray diffraction analysis, and similar analyses were made of -240 mesh fractions of run-of-mine ore and of the finest material from an ore-crushing plant. The airborne dust of respirable size tended to contain less hematite than the run-of-the-mine material, and to have a higher ignition loss. This higher ignition loss was probably due to the presence of smoke from acetylene lamps. The quartz content of the airborne dust was usually low, about 1 or 2%.

-- Bull. Hyg.

- 954 Silicosis from Street Dust. G. Sepke. *Z. ges. Hyg. u. ihre Grenzgebiete* 7, 833-837 (Nov. 1961). German.

Two patients are described who had no occupational dust exposure except that of the dust of the roads. The first patient was aged 70, and had a bilateral lung lesion thought to be a chronic bronchiectatic pulmonary tuberculosis. At his death, the post mortem revealed an anthraco-silicosis III with bronchiectasis. There was no tuberculosis. He had been employed since leaving school in the postal service and it was confirmed that as a young man he had worked a postal delivery and had breathed dust in the air from the sandy roads. The second patient was examined during a mass x-ray investigation in 1957. The fine nodulation then discovered remained unchanged in 1960 so that the diagnosis of silicosis was accepted in preference to tuberculosis, sarcoidosis or congestion. His employment since leaving school had been as a joiner, a concrete worker, a commercial traveler and in a paper business, which occupation was interrupted by service in the second war. The concrete work was unlikely to have produced enough dangerous dust to have caused trouble. For 17 months during his military service he had been employed on a motorised column in the neighborhood of Leipzig. The daily exercises were carried out in open wagons in very sandy by-ways. The patient was able to indicate the roads he traveled and these were investigated. In dry weather the dust cloud on these roads had between 1500 and 4000 particles per cc. and of under 5 microns to the extent of 99.5%. The quartz content was found to be 58%. In such cases there may be a special predisposition to silicosis.

-- Bull. Hyg.

- 955 The Dust in the Lungs of Hematite Miners from Cumberland. J. S. Faulds and G. S. Nagelschmidt. *Ann. Occ. Hyg.* (London) 4, 255-263 (Feb. 1962).

The amounts and composition of dust in 72 lungs of hematite miners from Cumberland were determined. The lungs were classified into 4 grades of fibrosis, each with presence or absence of acute tuberculosis at death. The average amount of dust increased with higher degree of fibrosis. The average composition of the lung dust was 81% hematite, 5% quartz, and 14% muscovite. In the 3 higher grades of fibrosis the average percentage of quartz was slightly but significantly higher in the tuberculosis-positive than in the negative lungs. For grades +, ++, and +++ respectively, the quartz percentages in the tuberculosis-positive lungs averaged 5.51, 6.06, and

6.37, whereas in those which were negative the corresponding percentages were 3.73, 4.63, and 5.81. From the quantities of dust found in the lungs and the number of years of exposure, annual dust accumulation rates were calculated. For 31 lungs with grade ++ or +++ fibrosis the average accumulation rate was 1.59 g. a year, and for 23 lungs with grade 0 or + fibrosis the rate was 0.69 g. a year. The rate for the higher degrees of fibrosis is similar to the average rate of 1.5 g. a year found in 10 coal miners with massive fibrosis. Similarities between coal miners' and hematite miners' pneumoconiosis are pointed out, and it is concluded that the dust in hematite mines is probably the more fibrogenic the more quartz it contains. -- Bull. Hyg.

956 Aluminum Pneumoconiosis. N. Edling. Acta Radiol. 56, 170-178 (Sept. 1961).

A review is made of 5 patients who were engaged in stamping powdered aluminum, without protection, during certain periods of their lives. All 5 complained of breathlessness after exposure to the aluminum dust for periods of 2 to 13 years. All cases presented fine striations or nodular rounded opacities on roentgen examination. In 4 cases coarse striations and pulmonary contraction were present as well as emphysema and thickened pleura. The 5 cases appear to remove doubt as to whether aluminum pneumoconiosis actually exists. Since these 5 cases appeared in a group of 35 operatives on similar work, it appears that there must be some degree of individual disposition factors. A period of 1 to 2 years occurs before the change from fine striations or nodular densities to fibrosis with pulmonary contracture and pleural thickening. Despite persistent fibrotic changes, 2 patients had no symptoms after the initial period of dyspnea. One case revealed a regressive course. The over-all course of the disease is considered as mild, and the diagnosis is best made by combined history and roentgenographic findings.

-- Am. Rev. Resp. Dis. Absts.

957 Alterations in Breathing and Dust Retention in Silicotic Patients. B. Barhad and L. Petrescu. Z. ges. Hyg. u. ihre Grenzgebiete 7, 837-841 (Nov. 1961). German.

This investigation was made on 102 persons, some healthy, some in the various stages of silicosis. The most constant and significant finding was a drop in the depth of breathing, in changing over from pure air to dust-laden air, in silicotic patients of stage III and in healthy persons. The depth of breathing in dust-laden air diminished with the progression of silicosis. The decrease in depth of inspiration of dusty air is a protective mechanism against the inhalation of dust. The ratio of the duration of expiration to the duration of inspiration was raised in healthy persons on breathing dust-laden air. In silicotic patients this finding is not constant. Dust retention rises equally in healthy persons and silicotic patients with increase of dust in the inhaled air. The group classed as "suspicious of silicosis", that is the early stage of the disease, show the greatest percentage of persons showing a rise of retention with increase of dust density. This is probably to be traced to an acute inflammation of the upper air passages. In order to find out where dust retention occurs in human airways, a model is used, which gives the state of retention from the first phase of expiration (air from the upper airways) and from the second phase (air from the deeper airways). With the progressive stages of silicosis, the retention extends more into the second phase of expiration. This is in the authors' opinion due to loss of elasticity of the silicotic lung tissue. The fact that dust retention in silicosis III patients approaches that of healthy persons means that these lung passages are no longer able to put up any obstacle to dust particles. Animals in the laboratory exposed to dust show changes in the bronchial mucous membrane, hypertrophy and hypersecretion. This gives protection against the retention of dust.

-- Cond. from Bull. Hyg.

958 Pneumoconiosis Case-Finding in Industry and Detection of Sources of Exposure. J. R. Eason. J. Occ. Med. 4, 406-410 (Aug. 1962).

A method whereby Community Chest X-ray-surveys can be used in detection and prevention of industrial pneumoconiosis has been proposed, and results of the application of this technique are presented. Following are the author's recommendations concerning the method: The radiologist who reads chest films from mass x-ray-surveys should be experienced in using these films to detect industrial pneumoconiosis. He should be provided with as much occupational history as possible (at least the place of present employment) when he reads the initial films. Subjects with x-ray findings suggestive of pneumoconiosis should be followed completely with medical and occupational history, thorough physical examination, and inspection and

survey of the work environment. When sources of exposure to pneumoconiosis-producing dusts are found, steps should be taken to eliminate or reduce the exposure and the plant management made aware of the risk of continued exposure. By using subjects diagnosed as having industrial pneumoconiosis as "indicators", sources of exposure can be found and steps taken to eliminate them. In the industrial pneumoconioses as in many other occupational diseases, the only "cure" is prevention. -- Author's summary

- 959 Respiratory Kymography in Silicosis. N. Edling and S. Schmidt.
Acta Radiol. 56, 241-250 (Oct. 1961).

The amount of work a patient with silicosis is capable of doing bears a direct relationship to the capacity of the lungs. This breathing capacity is best assessed by a study of diaphragmatic and costal movements. Roentgen kymography produces and records an objective record of the rib and diaphragm respiratory movements. Twenty-five cases representing stages 1, 2, and 3 are examined with kymographic technique. The technique is described in detail. The majority of the cases are in class 3. The majority of the cases did not influence the form of the kymographic waves of the ribs or diaphragm, indicating that lung changes in silicosis does not generally affect the form of the breathing mechanism. Diaphragmatic amplitude changes are average or increased in more than 75% of the cases, indicating that diaphragmatic function is usually not impaired. Actually, this suggests the development of a compensatory mechanism for the reduced respiratory capacity. The amplitude of costal movements is reduced or absent, signifying reduced respiratory capacity in the upper parts of the thorax. Deficient costal respiration is compensated by the diaphragmatic respiration. Respiratory kymography can be used as a qualitative functional test in evaluation of respiratory capacity. It is also valuable from a therapeutic point of view in that the results of therapy may be followed by such kymography.

-- Am. Rev. Resp. Dis. Absts.

- 960 The Directional Dependence of Air Samplers. H. Glauberman.
Am. Ind. Hyg. Assn. J. 23, 235-239 (May-June 1962).

Two filtration-type air samplers were tested in turbulent or positive directional air streams to determine if sampling is dependent on orientation of the sampling instrument. Uranium oxide dusts of 0.76, 2, and 3.25 microns median diameters were collected on Whatman No. 41 filter discs. In turbulent air no bias was found due to orientation. In a directional air stream, a sampler head facing into the air stream collected more dust by a factor of two. -- Author's abstr.

- 961 X-Ray Diffraction Analysis of Industrial Dust. N. A. Talvitie and L. W. Brewer.
Am. Ind. Hyg. Assn. J. 23, 214-221 (May-June 1962).

Procedures used routinely in the laboratories of the Division of Occupational Health for the x-ray diffraction analysis of industrial dust are presented with particular reference to new techniques for the collection and analysis of airborne dust when the total amount of sample is of the order of 1 milligram. The composition is given of a photographic developer for x-ray diffraction films which has low fogging properties and which provides a wide-range, linear intensity-density relationship. The use of beryl as an internal standard for the quantitative determination of quartz in industrial dust is discussed and results obtained by chemical methods are compared with results obtained by x-ray diffraction methods. -- Authors' abstr.

- 962 Scrubber Study with High Speed Photography. L. O. Reed.
Res./Develop. 13, 8-10 (July 1962). (Research/Development, F.D. Publications, Inc., 201 Wells St., Chicago 6, Illinois. *).

A two-dimensional model scrubber in conjunction with modern photographic techniques provided more meaningful data, reduced time, and expense involved in evaluation. A test unit designed for 500 cfm capacity was set up in the model laboratory and tests were made to determine collection efficiency on various types of dusts. From the design, fabrication and operation of the model, further knowledge has been gained concerning basic action occurring in the scrubbing process. The use of motion pictures provides the advantage of visually comparing two tests

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simultaneously at the convenience of the viewer and particular variations are continuously available for reviewing without need of reproducing the test set-up. -- APCA Absts.

PHYSICAL ASPECTS OF THE ENVIRONMENT

963 Two Cases of Osteo-Arthritis in Former Caisson Workers with Delayed Manifestations.

M. Gaultier, E. Fournier, P. Gervais and A. Ract.
Arch. maladies profess. 23, 32-38 (Jan.-Feb. 1962). French.

According to existing French law osteo-arthritis of the hip or shoulder in caisson workers is accepted as an occupational illness for the purposes of compensation only if it appears within 10 years of exposure. The present authors record the cases of 2 men in whom osteo-arthritis of the hip (and in one subject lesions at the lower end of the femur) occurred some 13 years after they had both been engaged in caisson work (the year 1954 mentioned in the paper should presumably read 1944). No other cause for their lesions could be discovered and it was considered that they were related to their previous work in compressed air. The clinical features and diagnosis are discussed fully and illustrative case notes are given together with skiagrams. The authors therefore suggest that the present statutory period of 10 years is too short.

-- Bull. Hyg.

964 Hearing Loss of Workers as a Function of Age and of Length of Exposure to Noise.

J. Huguet and J. E. Fournier. Arch. maladies profess. 22, 711-717 (Dec. 1961). French.

Audiometric tests with a Von Bekesey type audiometer were carried out on 206 employees in one engineering workshop of an aeronautical firm in the suburbs of Paris. Unfortunately, no indication is given of the time of day when the tests were undertaken, but they took place in a sound-treated booth. An octave frequency analysis of the noise in the workshop gave levels of 75 db at 4000 cycles per second, up to 85 db in the frequency band 300-600 cps. The criterion which was adopted for a diagnosis of acoustic trauma was that hearing loss should exceed 25 db at 4000 cps, and 35 db at 6000 cps, and on this basis 80 employees were classified as so affected, although 12 of these had only unilateral deafness. Hearing loss was found to increase progressively with increasing age and length of exposure to noise, and 85% of the employees over the age of 50 had some degree of acoustic trauma. However, the situation was not so serious when "social" hearing loss was estimated for the affected personnel. This was calculated on the basis of an average loss of 30 db or more for the 3 frequencies, 500, 1000, and 2000 cps. In these circumstances, only 7 persons, or 8.7% of affected personnel, had a "social" loss. The authors conclude with a calculation of the possible compensation costs, if compensation for occupational deafness existed in France, which it does not, and they find that the sum would probably be one which the engineering industry could easily assimilate.

-- Bull. Hyg.

965 Auditory Fatigue from Audio Analgesia. K. D. Kryter, A. Z. Weiss and F. M. Wiener.

J. Acoust. Soc. Am. 34, 383 (1962).

Three or more years ago experiments indicated that certain sounds (noise or music), employed in a specific way, might have significant analgesic effects in dentistry and perhaps other medical applications. These sounds must be kept below the level that will damage the ear during the usual exposure period. The authors report on a study to obtain data to support a suitable "damage-risk criterion" for use in the manufacture of the sound-producing equipment. Detailed data are contained in 9 figures and 6 tables. The authors conclude: (1) Exposure to a sound that in the average person causes a TTS₂ (temporary threshold shift) of 20 db or less at any frequency appears to be a "safe" exposure which makes due allowance for individual differences in susceptibility. (2) The authors' experiments show that "safe" exposures to sounds presumably suitable for audio analgesia can be accurately specified. (3) The formulas of Ward, et al, for

calculating the auditory fatigue due to continuous or intermittent exposure to broad-band sounds predict the results of the authors' experiments with considerable accuracy.

-- J. Occ. Med. Absts.

- 966 Hearing and the Driving of Locomotives. G. v. Schulthess and H. Kradolfer.
Schweiz. med. Wochschr. 92, 265-272 (Mar. 3, 1962).

The present paper deals with the hearing function of railway engineers and the relation between hearing function and the noise environment on electrical and diesel engines. No proof against or for a noise induced hearing loss in ear-sensible individuals in this category was found. The hearing of the trained engineer may be worse than that of certain workers employed in the external railway service. But for safety reasons all acoustical signals should be heard without difficulty. No engineer can be kept in service with a unilateral total deafness. Operative measures, e.g., in otosclerosis, may restore the required hearing function. Engineers wearing hearing aids should not be accepted in railway services.

-- Bull. Hyg.

- 967 Lower-Nephron Nephrosis Following Acute Hypoxia. H. W. Dietz.
J. Occ. Med. 4, 490-491 (Sept. 1962).

Two men in the course of their work entered a confined space in which the air had been displaced by vaporized liquid nitrogen. The one who was exposed for the shorter time recovered promptly. In the other, a lower-nephron nephrosis with oliguria developed and persisted for 8 days. This man was treated by means of strict regulation of fluid balances as well as measures to attempt maximal decrease in protein metabolism and in serum potassium level. The patient showed gradual but definite clinical improvement and was discharged after 58 days' hospitalization. When last seen approximately 8 months following discharge, he seemed entirely normal.

-- Author's summary

- 968 Coal Miners' Morbidity. F. D. K. Liddell.
J. Roy. Statistical Soc., Series A, 125, Pt. 1, 1-19, Discussion 19-29 (1962).
(Journal of the Royal Statistical Society, 21 Bentinck St., London W1, England⁴).

This paper is an attempt to determine whether the coal miner has an excessive amount of sickness after industrial injuries have been taken into account, and is based on Ministry of Pensions and National Insurance data for 1951 and 1955-1956. The rates for miners tend to be overstated since men in other occupations employed in the pits describe themselves as miners on their claims for sickness benefit, but they are not so classified in the Census. The size of this error cannot be exactly determined but on a small sample it was 17%. The various factors that increase the sickness rate among miners are discussed and it seems that the hazards to health are greater than in the general population and that they have a high rate of incapacity from injury and prescribed occupational diseases. The actual morbidity of the coal miner is close to the average except for certain conditions, and sickness absences from these causes are due to the greater physical demands of mining.

-- Bull. Hyg.

RADIOACTIVITY AND X-RADIATION

- 969 Handling Radioactive Materials. Anon. Nuclear Eng. 7, 224-238 (June 1962).

The techniques and equipment for handling radioactive materials in experimental facilities are described. Designs and characteristics are given for remote-controlled tongs and manipulators, glove box instruments, irradiation facilities, and remote-controlled welding and cutting machine. Equipment specifications indicate manufacturer, model, capacity, movement, and other characteristics.

-- Nuclear Sci. Absts.

* Address not in current List of Periodicals.

- 970 Present-Day Assessments of Radiation Hazards. B. Lindell.
Phys. Med. Biol. 6, 173-198 (Oct. 1961).

Present-day knowledge of the biological effects of ionizing radiation are reviewed together with available information on current levels of exposure. Although our experience has increased over the last few years, it is still not possible to answer the question whether low doses of radiation do in fact produce any harmful effects. On the other hand, the maximum risk of such effects occurring can be assessed, and it is evident that the number of persons affected will not be sufficiently high to be statistically detectable in any exposed group unless the dose substantially exceeds the limits at present recommended as permissible. Special emphasis is given to a survey of the data which are usually taken as the basis for assessment of the risk of radiation-induced somatic effects. The review of present radiation levels includes medical and occupational exposure as well as environmental contamination. The mechanism of fallout of fission products from nuclear test explosions and the subsequent transport of these products through the food-chains to the human body is now essentially better understood than was the case a few years ago.

-- Nuclear Sci. Absts.

- 971 Acute Radiation Syndrome Caused by Accidental Exposure to Cobalt-60.
E. C. Rossi, A. A. Thorngate and F. C. Larson. J. Lab. Clin. Med. 59, 655 (1962).

An acute radiation syndrome in a 33-year-old man occurred following a total-body exposure of about 250-300 r gamma-ray irradiation from a 200-c cobalt source. The source became detached from its holder without the operators knowledge and remained in a flask which was manually held for over 10 minutes. The dose to the mid-abdomen skin was estimated to be in excess of 3000 r on the basis of necrosis of the skin in this area. Nausea and vomiting were severe but of short duration, beginning 1-2 hours after exposure. A prompt lymphopenia was sustained for 30 days. Severe bone marrow depression occurred with maximal platelet depression (12,000 per cu. mm.) antedating by several days the maximal white cell depression (1200 per cu. mm.) on the 34th day. Unusual features, such as the onset of lymphocyte recovery on the 30th day, and the epilation and skin changes over the mid-abdomen, are explained on the basis of uneven dose distribution. Treatment was conservative without the use of antibiotics, blood, or platelet transfusions.

-- J. Occ. Med. Absts.

- 972 Genetic Survey of Offsprings of X-Ray Workers. T. Kitabatake.
Ind. Med. & Surg. 31, 347-350 (Aug. 1962).

Sterility, stillbirth, infant deaths, and sex ratio of offsprings of x-ray workers were surveyed in Aichi prefecture in Japan. Primary sterility was seen in the exposed group more frequently with statistical significance than in the control group. This is probably due to the large radiation dose received in the 2-year period before and after marriage. Secondary sterility, stillbirth and abortion, infant death, and average number of children per worker were about the same in incidence in both groups. Male childbirths increase proportionately to the radiation dose accumulated by the fathers from the commencement of x-ray work to one year prior to childbirth. The regression coefficient of the sex ratio of the offsprings was estimated to be $8.0 \times 10^{-5}/r$.

-- Author's summary

- 973 Some Experience with Radioiodine in the Reactor Buildings at Chalk River. C. G. Seymour.
Am. Ind. Hyg. Assn. J. 23, 240-244 (May-June 1962).

Practical experience with radioiodine in the heavy water reactors at Chalk River, Ontario, is described. Airborne and surface contamination caused by the release of radioiodine from ruptured fuel in the reactor and defective fuel samples in the high pressure, high temperature experimental loops are discussed. Monitoring techniques, skin contamination and uptake of radioiodine by operating personnel are described briefly.

-- Author's abstr.

- 974 Nevada Test Fallout and Radioiodine in Milk. R. E. Lapp. Science 137, 756-758 (Sept. 7, 1962).

The iodine-131 dosage to infant thyroids as a result of Nevada testing is evaluated. The case of heavy fallout in the Troy, N. Y. area on April 26, 1953 is cited. The possibility is discussed that a thyroid cancer survey would provide a critical test of linear response versus threshold theory for radiation injury to tissue.

-- Author's abst.

- 975 Skin Decontamination in Presence of Thallium-204. M. H. Faes. Nature 194, 1188-1189 (June 23, 1962).

Decontamination tests on rat skins contaminated with Tl-204 sulfate solution were conducted with 3 decontaminating solutions: soap, sodium ethylenediamine tetraacetic acid, and calcium ethylenediamine tetraacetic acid. The results indicate that a solution of water and soap is the most efficient agent. A device is described for continuous-flow decontamination with minimum rubbing, time, and spreading of contaminant.

-- Nuclear Sci. Absts.

- 976 Safe Limits of Occupational and General Exposure to Radiation. J. F. Loutit. Roy. Soc. Health J. 81, 233-236 (Sept.-Oct. 1961).

The biological effects of radiation are reviewed from the standpoint of safe limits of occupational and general exposure to radiation. It is pointed out that many people are exposed to small doses of radiation through their occupations. Those occupationally exposed are all over age 18 and under the supervision of competent medical authorities. The principal limiting factor as far as exposure of the general population is concerned is the genetic problem of inheritance, and this must be considered carefully in establishing limits of radiation exposure.

-- Nuclear Sci. Absts.

- 977 Protective Measures Against the Effects of Radiation from Radioactive Materials Used in Industry. W. Schwarzer. Kerntechnik 4, 56-59 (Feb. 1962). German.

Protective measures against external radiation hazards are described, and practical examples, in connection with sealed sources, are given. The special protective measures taken against air and water contamination are also explained. An example shows how the required protective measures can be derived and calculated for a special case.

-- Nuclear Sci. Absts.

ENVIRONMENTAL MEASUREMENTS

- 978 An Evaluation of Micro-Vacuum Sublimation Separation of Atmospheric Polycyclics. W. L. Ball, et al. Am. Ind. Hyg. Assn. J. 23, 222-227 (May-June 1962).

A micro-vacuum sublimation technique was studied for the separation of polycyclic hydrocarbons from samples of atmospheric pollutants. This technique gives quantitative separations of pyrene from particulate samples directly and from the extracts of such samples. The efficiency of separation is of the same order as that of column chromatography, and sublimation is more rapid. Enrichment of extracts of residues from column eluates can be effected.

-- Authors' abst.

- 979 Macromolecular Compounds Isolated from Airborne Particles by Electrophoresis and Paper Chromatography. V. Goppers and H. J. Paulus. Am. Ind. Hyg. Assn. J. 23, 181-185 (May-June 1962).

Paper chromatography and electrophoresis are used to isolate microquantities of 2 biologically significant compounds, "A" and "B", from samples of airborne particles. Electrophoretic and chromatographic patterns are presented and discussed. A new rapid electrophoresis method is described which requires only 2 hours for separating a complicated mixture of aglycones.

-- Authors' abst.

- 980 Atmospheric Ozone. J. L. Kroening and E. P. Ney.
J. Geophys. Res. 67, 1867-1875 (May 1962). (Journal of Geophysical Research, American Geophysical Union, 1515 Massachusetts Avenue, N.W., Washington 5, D.C. *).

Measurements of ground-level ozone and the vertical distribution of ozone are given. Ground measurements show a strong diurnal variation coincident with the formation of a temperature inversion. Adsorption, storage, and desorption of ozone at the earth's surface are discussed, along with decomposition. The strength of the ozone sink at the earth's surface is determined to be approximately 6×10^{10} atoms of ozone/cm²·sec. A latitudinal and seasonal variation in the sink strength at the earth's surface is suggested in relation to the latitudinal and seasonal variation of total ozone. The vertical diffusive transport of ozone is considered, and evidence is given for the direct transport of air between the stratosphere and the troposphere via thin stable laminae. Data are presented indicating that the tropopause is not a barrier to the direct exchange of matter between troposphere and stratosphere. An explanation for the occurrence of secondary ozone maxima in the stratosphere is given. The production of ozone by lightning is calculated to be of the same order of magnitude as that produced by solar ultraviolet light. It is calculated that the ozone produced by a 50-megaton nuclear device amounts to about 0.1% of the total ozone in the atmosphere.

-- APCA Absts.

- 981 Elimination of Nitrogen Dioxide Interference in the Determination of Sulfur Dioxide.
P. W. West and FE Ordoeza. Anal. Chem. 34, 1324-1325 (Sept. 1962).

Continuous and spot determinations of sulfur dioxide in air pollution are made by a very sensitive method based on the fixation of the gas on tetrachloromercurate (II) followed by spectrophotometric determination with formaldehyde and p-rosaniline hydrochloride. Nitrogen dioxide in amounts of 2 ppm interferes with color formation and is converted to nitrogen by reaction with sulfamic acid.

-- AC Briefs

- 982 Contamination of Vegetation by Tetraethyl Lead. Helen L. Cannon and Jessie M. Bowles.
Science 137, 765-766 (Sept. 7, 1962).

Tetraethyl lead is a normal constituent of vegetation growing along our highways. Washed grass near Denver contained 3000 ppm (in ash) near major intersections and greater than 50 ppm for 500 feet downwind. Vegetables grown within 25 feet of a road in upstate New York and western Maryland averaged 80 to 115 ppm.

-- Authors' abst.

PREVENTIVE ENGINEERING

- 983 Controlling Airborne Contaminants. W. V. Andresen.
Natl. Safety News 86, 20-21, 97-100 (Sept. 1962).

Mechanical exhaust ventilation is one of the best tools available to the industrial hygienist or safety engineer for the protection of workmen. Control of airborne contaminants in industry may be accomplished by either of 2 methods of ventilation—general ventilation and local exhaust ventilation. In general ventilation, a contaminant is diluted with clean air after it has been released into an area. Thus, general ventilation will be satisfactory in cases where small amounts of hazardous materials are released into relatively large work areas. General ventilation may prove satisfactory in the control of substances such as sawdust, starch, plastic, and similar materials which present only a fire hazard and not a health hazard. Local exhaust ventilation is a much more positive way of providing control of atmospheric contaminants than general ventilation. In local exhaust ventilation, an attempt is made to capture the hazardous material at the source before it can escape into the workroom—or at least to capture enough of the material so the resulting workroom air mixture is within safe limits. In contrast with general ventilation, control can be realized with a relatively small volume of air. There is no

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necessity to dilute the contaminant to a hygienically insignificant concentration in the exhaust, but some dilution may be required to maintain a safe concentration in the duct for fire prevention purposes. Control of a contaminant by local exhaust ventilation can often be accomplished by several hundred cubic feet of air per minute. Dilution of the same amount of contaminant to safe levels by general ventilation could conceivably require thousands of cubic feet per minute. Several types of ventilating hoods are discussed and a canopy hood is illustrated.

COMMUNITY AIR HYGIENE

- 984 The Use of Adhesive-Coated Paper for Estimating Incinerator Particulate Emissions.
C. W. Gruber and C. E. Schumann. *J. Air Poll. Control Assn.* 12, 376-378 (Aug. 1962).

The use of adhesive-coated paper for estimating incinerator particulate emissions has shown merit as an effective tool for regulating fly ash emissions from these sources. Test data obtained to date show a close relationship between adhesive-paper loadings and excessive emissions as indicated by citizen complaints.
-- Authors' conclusions

- 985 Multicontaminant Tester. R. Swift. *Instr. Control Systems* 35, 124-125 (May 1962).
(Instruments and Control Systems, 1600 North Main St., Pontiac, Ill. *).

Air contaminants can be monitored and measured by reacting the suspected gas with chemicals that cause a stain to appear. The testing pump provides precise volume control in measuring concentrations of a variety of toxic gases and vapors and other fumes and mists. A turret head makes air sampling possible at any 4 distinct rates of flow. The handle of the pump can be withdrawn to any of the 4 different calibrated positions to give sample volumes of 25, 50, 70, or 100 cc. A table lists contaminants, together with the measurable range and 1961 threshold limit values.
-- APCA Absts.

- 986 Prevalence of Chronic Respiratory Disease in a New Hampshire Town.
B. G. Ferris, Jr. and D. O. Anderson. *Am. Rev. Resp. Dis.* 86, 165 (Aug. 1962).

A prevalence survey was conducted in the winter and summer of 1961 in a pulp and paper town, utilizing a standard respiratory questionnaire and 2 tests of respiratory function. This preliminary report emphasizes methods. The significance of variables of age, sex, and smoking habits is outlined. The problems of distinguishing these effects from those of atmospheric pollution have been stressed. Special emphasis is placed on the importance of controlling the smoking variable before the effect of other variables such as atmospheric pollution can be determined.
-- J. Am. Med. Assn. References & Reviews

- 987 Liberation of Pyrite from Steam Coals. R. A. Glenn and R. D. Harris.
J. Air Poll. Control Assn. 12, 388-395, 404 (Aug. 1962).

Application of modern microscopic and chemical techniques in the characterization of a group of selected high sulfur bituminous coals has shown that the major portion by weight of the pyrite present exists as particles large enough to be readily separated once they are liberated. Results from initial laboratory tests indicate that liberation of the major portion of the pyritic matter of the nonpyritic mineral matter may be accomplished by controlled pulverization to sizes coarser than that now obtained in modern pulverized coal-fired power plants. The results also indicate that during pulverization the pyrite tends to concentrate in the various particle-size fractions. The microscopic pyrite particles embedded in the coal substance tend to concentrate in the very fine fractions, that is, fractions below minus 200 mesh. The larger pyrite particles

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that are associated with the mineral matter tend to concentrate in the greater-than-60-mesh fraction. However, for the full benefits of these results to be realized in commercial practice, much additional research will be necessary to develop practical pulverizing machinery and techniques. Where the pyritic sulfur is mainly associated with mineral matter, there are good prospects of its removal by adapting presently available equipment. Removal of the pyrite grains that are embedded in the organic matter will require the development of improved equipment for processing coal in the minus 200 mesh size.

-- Cond. from authors' summary

- 988 An Air Slide Classifier. P. A. Toynbee and F. W. London.
Brit. Chem. Eng. 7, 425-427 (June 1962).

The air slide classifier provides a practical method of upgrading fine coal by dedusting and blending in the same operation. It also offers promise of more general application in the dedusting in a wide range of granular materials. Combustion tests have shown that a sub-bituminous coal dedusted with an air flow of 50 cfm. and blended with 20% of a highly swelling bituminous coal, similarly dedusted, gives a most satisfactory fuel for underfeed stokers. The dedusted coal is free-flowing, clean to handle, and there is no appreciable emission of grit during combustion.

-- APCA Absts.

- 989 Problems of the Smoke Emitted from Electrometallurgical Ovens. W. Muhirad.
Staub 22, 42-50 (Feb. 1962). German.

In all electrometallurgical processes, large quantities of smoke are formed having particles below 1 micron in size and whose collection is extremely difficult. In this paper the important properties of the gases and smoke occurring in the various electrometallurgical processes are summarized. Plants suited for removal of dust from the waste gases are listed. In particular, the use of cloth filters which make possible complete removal of color from the smoke is dealt with. Experience is reported which has been obtained particularly on ferro-silicon furnaces. Cloth filters can only be employed if a system precedes them for conditioning the gases with automatic temperature control.

-- APCA Absts.

- 990 Catalytic Oxidation of Automotive Exhausts. Laboratory Evaluation of Catalysts. W. A. Cannon and C. E. Welling. Ind. Eng. Chem. Prod. Res. Develop. 1, 152-156 (Sept. 1962). (Industrial and Engineering Chemistry, Product Research and Development, American Chemical Society, 1155 16th Street, N.W., Washington 6, D.C. *).

Oxidation of 0.1 volume % or more of gasoline vapor in simulated exhaust plus secondary air is complete with several types of catalysts at feed temperatures of 350°C or less and at space velocities comparable to those anticipated in automotive applications. Volume requirements of secondary air is generally little more than the stoichiometric requirement. The following materials catalyze the oxidation of simulated exhausts from unleaded gasoline: manganese-copper oxides, copper chromite, silver oxide-barium peroxide, iron oxide, copper oxide, vanadia, platinum, and palladium. Manganese-copper oxides, silver oxide-barium peroxide, and copper-promoted iron oxide undergo phase changes and also lose catalytic activity when heated to 760°C for 16 hours. This suggests that these catalysts might become ineffective on exposure to the conditions which could occur in the treatment of exhausts. Certain catalysts—e.g., copper chromite—oxidize carbon monoxide at a lower temperature than gasoline vapor. -- Authors' conclusions

- 991 Carcinogenic Properties of Motor Transport Exhaust Soot. B. P. Gurinov, et al.
Gigiena i Sanit. 27, 19-27 (Jan. 1962). Russian.

The results of investigations revealed that average contents of 3,4-benzpyrene in the soot of a carburetor motor comprise 0.02% and that of a diesel 0.0001%. Skin applications and intradermal injections in biological tests on black mice of strain C₅₇ and on the brown strain CC₅₇, have shown that in the majority of cases the soot from the carburetor motor caused development of malignant tumors, while the soot from diesel engines did not produce any tumors on the site of its introduction. Certain practical suggestions are made.

-- APCA Absts.

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MANAGEMENT ASPECTS

- 992 The Realities of Rehabilitation. E. D. Leonard. J. Occ. Med. 4, 475-481 (Sept. 1962).

Industrially injured employees can only be fully rehabilitated by return to employment. Efforts to have employers hire persons suffering from prior injuries or disabilities through appeals to sympathy have been practically useless. Employers refrain from hiring individuals with known pre-existing ailments because of the belief that any untoward developments of these antedating ailments occurring during employment will be charged to them. This belief is repeatedly substantiated by "liberal" awards under the workmen's compensation laws charging employers with liability for medical care, disability benefits, and death payments for conditions basically unrelated to employment. These liberal decisions usually are predicated on an "aggravation" theory, though the role of the employee's work is often highly questionable. Until employers can be assured that they will not be held responsible for the expected consequences of previous ailments they will not knowingly hire "handicapped" persons. Substantial sums are currently paid for permanent disabilities on the theory that those who suffer from them will have difficulties in their future employment; these monetary payments are being made to aid in their "rehabilitation". Many such payments are warranted and accomplish their purpose. Excessive sums though are awarded for nonexistent, trivial, or fictitious disabilities. These sums so dissipated are more than adequate, if properly disbursed, to fully meet all rehabilitation costs. They should be reassigned to that purpose. The states have adequate facilities and agencies to care properly for all rehabilitation problems without federal intervention. All that is needed is a sensible use of money now available. -- Author's summary

- 993 Evaluation of Claims of Loss of Hearing from Head Injuries. M. A. Furman. J. Occ. Med. 4, 399-405 (Aug. 1962).

In this paper the author presented the circumstances under which one might find a hearing loss occurring from head injury and the pattern of hearing loss appearing with such injuries. It is hoped thereby that causal relationship of hearing loss to head injury will be more clearly understood by those confronted with hearing loss in workmen's compensation cases. Reviewed were the clinical manifestations and pathologic findings in traumatic types of hearing loss that can be attributed to impacts against the skull and the ears. This was based on clinical findings in humans and on experimental evidence in animals. These findings explain the presence or absence of traumatic hearing loss associated with all other types of physical violence to the head, such as direct blows on the face, jars of the head by impacts traveling up the spine from the heels or buttocks, or from jolts occurring in whiplash injuries. The significance of cerebral concussion, and the contrast in hearing loss occurring from longitudinal and transverse fractures of the temporal bone at the base of the skull, were given special consideration. The need of special training and experience in making hearing tests on litigation-minded individuals, the significance of the pattern of traumatic hearing loss, and the importance of uniform "standards" in the testing of hearing loss were stressed. -- Author's summary

ACCIDENTS AND PREVENTION

- 994 An Electrical Hazard of Selective Angiocardigraphy. G. A. Bouvaros, C. Don and J. A. Hopps. Can. Med. Assn. J. 87, 286-288 (Aug. 11, 1962).

Two instances of ventricular fibrillation are described, one in a 26-year-old man and one in an experimental animal. These episodes occurred during passage of a catheter into the heart or aortic root under continuous electrocardiographic monitoring. In both instances, the ventricular fibrillation occurred when the intracardiac catheter was connected to an

electrically powered injection apparatus. On the strength of subsequent electrical measurements, it is considered that fibrillation in both cases was due to the passage of an electrical current between the catheter tip, acting as an intracardiac electrode, and the limb leads of the electrocardiograph recorder. Passage of the current was attributed to inadequate grounding of the injection apparatus in one instance, and to inadequate grounding of the electrocardiograph recorder in the other.

-- Authors' summary

- 995 The High Cost of Industrial Backache. Anon. *Safety Maint.* 124, 47-48 (Sept. 1962).

One of the most common problems facing industry today, outside of a common cold, the most perplexing to physicians is "backache". A number of states have compiled average costs of back injury cases: Illinois, \$165; Minnesota, \$227; New Jersey, \$501; Wisconsin, \$134; and Pennsylvania, \$208. Individual cases often cost more in dollars and time-off-the-job than broken legs or arms. One individual suffering from sacro-iliac sprain cost \$7,063. Another cost \$3,509 and laid the individual up for 960 days. According to Dr. Milton E. Eisen, Chief of the Peripheral Vascular Disease Section of the New York Medical College, backaches fall into 6 general categories: (1) Traumatic, covering aches caused by physical injury from outside the body. (2) Atraumatic, which includes all spinal distress originating from fatigue or strain rather than accident or illness. (3) Psychosomatic. (4) Referred pain, indicating some trouble in another part of the body. (5) Organic disease, such as osteoarthritis of the lumbar spine, sciatica, sacro-iliac strain and herniated intervertebral discs. (6) Circulatory diseases such as the hardening of the arteries on the pelvis. Yet statistics indicate the great majority of these afflictions—almost 90%—are caused by fatigue and strain, by man's misuse and abuse of body. Such deficiencies as faulty posture, overweight, relaxed abdominal musculature, inequality of the length of the lower extremities and improper lifting of heavy objects are mechanical factors which prevent the maintenance of proper body balance. One large company concluded from a study of over 1700 back injury cases that lifting and twisting were the prime factors for disability while slipping and falling were in strong contention. One important deduction from the study was that close to 50% of back injuries occurred in the first 2 years of work on a specific job.

MISCELLANEOUS

- 996 Aerobic Treatment of Textile Mill Waste. E. L. Jones, et al. *J. Water Pollution Control Fed.* 34, 495-512 (May 1962).

The performance of the single-stage contact stabilization process in the treatment of combined domestic wastewater and cotton processing and finishing wastes compares favorably with that of 2-stage bio-oxidation processes. It can be concluded that long-term aerobic stabilization provided excellent treatment for the raw wastewaters from cotton processing and finishing plants with only a small amount of domestic wastewater used as seed. The process can be modified to meet the conditions and efficiencies desired by varying the aeration period and the solids concentration in the aeration basin.

-- Public Health Eng. Absts.

- 997 Full-Scale Anaerobic Digestion of Effluents from the Production of Maize-Starch. J. Hemens, P.G.J. Meiring and G. J. Stander. *Water Waste Treat. J.* 9, 16-18 (May-June 1962). (*Water and Waste Treatment Journal*, Dale Reynolds & Company, Ltd., 2 Broad Street, London EC2, England*).

Waste waters from the production of maize-starch and glucose can be successfully stabilized by anaerobic digester and clarifier based on the standard Dorr Oliver "Clarigester". The waste waters contain sufficient of the nutrients necessary to allow continuous digestion without addition of other materials. Satisfactory digestion can be maintained without the removal of

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dissolved sulfide. The digester effluent is suitable for discharge to a sewer and further treatment on biological filters. The excess sludge built up in the digester dries easily to a stable humus material with little odor.

-- Cond. from Public Health Eng. Absts.

- 998 Some Correlates of Opinion on Fluoridation. A. Simmel and D. B. Ast.
Am. J. Public Health 52, 1269-1273 (Aug. 1962).

Inquiry into correlates of attitudes toward fluoridation has led the authors to consider a number of mechanisms that are likely to play a role in influencing attitudes. Clearly, communication about fluoridation has been inadequate to provide a basis for a rational decision in considerable parts of the population. Communication from the medical profession seems to be impeded, in part, by unfavorable attitudes toward physicians, and it seems reasonable to ask whether communication between public health and the public is similarly impeded. An important mechanism facilitating opposition to fluoridation seems to be provided by the channeling of hostile reactions to a wide variety of dissatisfactions against the issue and the proponents of fluoridation. It would appear that one long-run implication for public health is to work toward generating a more favorable and more visible public image of itself. Moreover, reasonable hypotheses about the mechanisms which stimulate or support opposition, as well as knowledge of the location in society of the opposition centers should be of some help in the design of health education programs and strategies.

-- Authors' conclusions

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