IN THE ABRAMS November 1992

HHBB-0020052

Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

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LEGAL

FEBRUARY, 1967
(Vol. 31, No. 2)

INDUSTRIAL HYGIENE FOUNDATION
MELLON INSTITUTE
4400 FIFTH AVENUE -:- PITTSBURGH, PA. 15213

03122381

NWBB-002053

November 1992

IN REPLY ABRAMS

INDUSTRIAL HYGIENE FOUNDATION
OF AMERICA, Inc.

Chemical-Toxicological Series, Bulletin No. 6

RANGE-FINDING TOXICITY DATA FOR 43 COMPOUNDS

4400 Fifth Avenue
Pittsburgh, Pennsylvania
1967

03122382

IN RE: ABRAMS November 1992

MWB-0020054

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Industrial Hygiene Foundation of America, Inc.

Pittsburgh, Pa.

03122383

(Printed in U.S.A.)

MWBB-0020055

November 1992

IN ARCHIVES

FOREWORD

Individually, the short-term toxicological research findings presented herein did not merit consideration for publication. Summarized, in tabular fashion, however, such findings have made useful contribution to the toxicological literature.

Sponsors of this research have agreed to collective publication of these findings, and it is hoped that their example will be followed by others in industry. It is becoming increasingly apparent that such data lying dormant in industry's files serves no one.

Undoubtedly, much information which exists will, upon careful study, be found unsuitable for publication for one reason or another (e.g., results on proprietary mixtures of compounds). The Foundation's staff and Chemical-Toxicological Committee are prepared to receive data from individual companies in order to help develop sufficient data for other similar bulletins in this series from time to time.

Steps are also under way to develop better information from human exposure to known concentrations of potentially toxic materials to help validate threshold standards set on data from animal experiments. Much of the human data will be negative and will never become published, but must be maintained in a systematic manner nevertheless.

Extensive cooperation of industry is prerequisite to further progress and is earnestly solicited.

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ACKNOWLEDGMENTS

Many persons have contributed through their technical performance to the results obtained. In particular, the authors acknowledge the work of Dr. Marion Westrick and Mr. James McNerney. The Research Laboratory is under the direction of Dr. Paul Gross.

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NWBB-0020057

RANGE-FINDING TOXICITY DATA FOR 43 COMPOUNDS*

William E. Rinehart, Sc.D., Marianne Kaschak, B.S. and Emil A. Pfitzer, Sc.D.**

Industrial Hygiene Foundation, Pittsburgh, Pennsylvania

Introduction:

Range-finding toxicity tests have been performed by the Research Laboratory of the Industrial Hygiene Foundation for a number of years. A part of these data have now been made available for publication.

Smyth and Carpenter[1] introduced the range-finding test in the industrial laboratory and have presented data on several hundred materials.[2-6] Their description of the role of range-finding tests bears repetition here:

". . . the range-finding test is relied on only to allow predictions of the comparative hazards of handling new chemicals. Acute toxicity studies, no matter how precisely executed, yield no more than an indication of the degree of care necessary to protect workers or lead to an opinion that certain technically feasible applications of a chemical may or may not eventually be proved safe."

This type of toxicity test procedure is utilized to obtain information for precautionary labeling of hazardous household chemicals. Regulations pursuant to the Federal Hazardous Substances Labeling Act delineate toxicity testing procedures which shall be required for chemicals contained in household substances. In order to facilitate such toxicity tests the Committee on Toxicology

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*The toxicity data summarized in the report was obtained in part by the following members of the Foundation: Celanese Corporation, Koppers Company, Inc., and Pittsburgh Plate Glass Company.

**Present address of Dr. Pfitzer: Kettering Laboratory, Cincinnati, Ohio 45219.

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UNITED STATES ATOMIC ENERGY COMMISSION NOV 13 1962

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of the National Academy of Sciences-National Research Council has provided a publication titled, "Principles and Procedures for Evaluating the Toxicity of Household Substances."[7]

The purpose of this manuscript is to make available data where none has been previously published, or to allow comparisons where others may have studied the same material.

Methods and Results:

The methods for obtaining the range-finding data of this presentation are generally consistent with the NAS-NRC publication.[7] Variations which may be considered important are indicated by appropriate footnotes. Compounds are listed according to their chemical grouping in Table 1.

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Table I

RANGE-FINDING TOXICITY DATA

Material	Single Oral LD_{50}-Rats (gm/kg)[a]	Single Skin Pen. LD_{50}-Rabbits (gm/kg)[a]	Inhalation by Rats: Conc.	Inhalation by Rats: Time	Inhalation by Rats: Mortality	Irritation to Rabbit Skin (Draize Units)	Irritation to Rabbit Eye (Draize Units): Conj.	Irritation to Rabbit Eye (Draize Units): Iris	Irritation to Rabbit Eye (Draize Units): Cornea
Hydrocarbons & Substituted Hydrocarbons:									
1-Chloromethyl-naphthalene	0.89	2.00	0.44mg/l[c] 0.52mg/l[c]	1 hr. 1 hr.	0/5 0/5	—	—	—	—
1, 3, 5-Hexatriene	0.21	6.73	100,000 ppm (approx.)	30 min. 15 min. 5 min.	6/6 6/6 1/6	Negative[b]	Slight[b]	Slight[b]	Negative[b]
Hydroxy Compounds:									
4-Acetylresorcinol (2, 4-Dihydroxy-acetophenone)	2.83	>3.98	—	—	—	0	Severe[b]	Severe[b]	Severe[b] but Reversible
p-t-Amylphenol	1.83	>3.16	—	—	—	Corrosive	Severe[b]	Severe[b]	Severe[b]
6-t-Butyl-3, 4-xylenol	1.03	0.71	—	—	—	Corrosive	24 hr. 17/20 48 hr. 17/20 72 hr. 17/20	5/10 5/10 5/10	40/80 60/80 56/80
6, 6'-Butylidene bis (2, 4-xylenol)	5.50	>3.98	—	—	—	0	24 hr. 4/20 48 hr. 4/20 72 hr. 0/20	0/10 0/10 0/10	2/80 0/80 0/80
p-t-Butylphenol	5.66	>3.16	—	—	—	Corrosive	Severe[b]	Severe[b]	Severe[b]
dl,-2,3,-Dibromo-1,4-butanediol	2.46	>2.00	—	—	—	0	24 hr. 16/20 48 hr. 10/20 72 hr. 8/20	5/10 5/10 5/10	20/80 19/80 19/80

See end of table for footnotes.

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RANGE-FINDING TOXICITY DATA (Continued)

Material	Single Oral LD_{50}- Rats (gm/kg)[a]	Single Skin Pen. LD_{50}- Rabbits (gm/kg)[a]	Inhalation by Rats Conc.	Time	Mortality	Irritation to Rabbit Skin (Draize Units)	Irritation to Rabbit Eye (Draize Units) Conj.	Iris	Cornea
Hydroxy Compounds: (Con't)									
dl, -2, 3-Dichloro-1, 4-butanediol	2.83	>2.00	—	—	—	0.5	24 hr. 16/20 48 hr. 12/20 72 hr. 11/20	5/10 4/10 5/10	20/80 34/80 40/80
Diresorcyl Sulfide	4.29	—	—	—	—	0	Severe[b]	Severe[b]	Severe[b]
2, 4-Di-t-amyl-phenol	0.33	>3.16	—	—	—	Corrosive	Moderate[b]	Moderate[b]	Slight[b]
1, 6-Hexanediol	7.13	>3.98	—	—	—	0	24 hr. 11/20 48 hr. 10/20 72 hr. 9/20	5/10 3/10 3/10	4/80 3/80 3/80
2, 2'-Methylene bis (4, 6-di-t-butyl-3-methylphenol)	>20.00	>3.98	—	—	—	0	24 hr. 2/20 48 hr. 0/20 72 hr. 0/20	0/10 0/10 0/10	0/80 0/80 0/80
2, 2'-Methylene bis (6-t-butyl-3, 4-xylenol)	>20.00	>3.98	—	—	—	0	24 hr. 1/20 48 hr. .4/20 72 hr. 0/20	0/10 0/10 0/10	0/80 0/80 0/80
6-t-Octylamino-methyl-4-benzoyl resorcinol	>5.00	—	—	—	—	—	24 hr. 1/20 48 hr. .6/20 72 hr. 0/20	0/10 0/10 0/10	0/80 0/80 0/80
n-Propanol	5.40	6.73	20,000 ppm 20,000 ppm	1 hr.[f] 1 hr.[f]	0/5 0/5	0	24 hr. 16/20 48 hr. 16/20 72 hr. 15/20	5/10 4/10 4/10	19/80 22/80 27/80
Resorcinol, Flaked Grade	0.98	3.36	—	—	—	4.4	24 hr. 20/20 48 hr. 20/20 72 hr. 20/20	5/10 5/10 5/10	80/80 80/80 80/80
2, 6-Xylenol	0.4	1.00	—	—	—	Corrosive	24 hr. 15/20 48 hr. 14/20 72 hr. 13/20	5/10 5/10 5/10	40/80 40/80 40/80

See end of table for footnotes.

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RANGE-FINDING TOXICITY DATA (Continued)

Material	Single Oral LD_{50}-Rats (gm/kg)[a]	Single Skin Pen. LD_{50}-Rabbits (gm/kg)[a]	Inhalation by Rats Conc.	Time	Mortality	Irritation to Rabbit Skin (Draize Units)	Irritation to Rabbit Eye (Draize Units) Conj.	Iris	Cornea
Acids:									
9, 9'-Fluorenedi-propionic Acid	2.14	—	—	—	—	0	Slight[b]	Negative[b]	Negative[b]
Norcamphoric Acid	3.25	>3.98	—	—	—	2.0	24 hr. 13/20 48 hr. 14/20 72 hr. 13/20	5/10 5/10 5/10	40/80 50/80 35/80
Aldehydes:									
Diphenaldehyde (2, 2'-Diformyl-biphenyl)	2.83	—	—	—	—	Moderate[b]	Severe[b]	Severe[b]	Severe[b]
Paraformaldehyde	1.55	—	—	—	—	—	—	—	—
Esters:									
Dibutyl Norcam-phorate	6.50	>15.8	0.025 mg/l[c]	8 hrs.	0/6	0	24 hr. 0/20 48 hr. 0/20 72 hr. 0/20	0/10 0/10 0/10	0/80 0/80 0/80
Dimethyl Norcam-phorate	—	—	—	—	—	0	Severe[b]	Severe[b]	Severe[b]
Ethyl-α-(hydroxy-methyl) acrylate	0.62	0.36	150ppm[c] (approx.)	8 hrs.	0/6	Moderate[b]	Severe[b]	Severe[b]	Severe[b]
1% in water	—	—	—	—	—	Negative[b]	Slight[b]	Negative[b]	Negative[b]
Isopropyl Chloroformate	1.07	11.3	—	—	—	Slight[b]	Severe[b]	Severe[b]	Severe[b]
Isopropyl Percarbonate	2.14	—	—	—	—	—	—	—	—
45% in 1:1 Benzene-Cyclohexane	6.9	4.0 ml/kg	—	—	—	Corrosive[b]	Severe[b]	Severe[b]	Severe[b]

See end of table for footnotes

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RANGE-FINDING TOXICITY DATA (Continued)

Material	Single Oral LD_{50}-Rats (gm/kg)[a]	Single Skin Pen. LD_{50}-Rabbits (gm/kg)[a]	Inhalation by Rats Conc.	Time	Mortality	Irritation to Rabbit Skin (Draize Units)	Irritation to Rabbit Eye (Draize Units) Conj.	Iris	Cornea
Esters: (Con't)									
Propylene Glycol Monoacrylate	0.59	—	—	—	—	—	—	—	—
Tri-β-Chloroethylphosphate	1.23	—	—	—	—	—	—	—	—
Ethers:									
2, 3, 5, 6-Tetrachloronitroanisole	0.26	3.36	111 mg/m³[e]	7 hrs.	0/5	—	—	—	—
Trimethylolpropane Diallyl Ether	6.50	>15.8	—	—	—	—	—	—	—
Trimethylolpropane Monoallyl Ether	4.93	>15.8	—	—	—	—	—	—	—
Amines & Nitrogen Compounds:									
9, 9'-Fluorenedipropionitrile	2.18	—	—	—	—	0	Negative[b]	Negative[b]	Negative[b]
9, 9'-Fluorenedipropylamine	0.62	—	—	—	—	Corrosive	Severe[b]	Severe[b]	Severe[b]
10% in water	—	—	—	—	—	—	Severe[b]	Severe[b]	Severe[b]
1% in water	—	—	—	—	—	—	Severe[b]	Severe[b]	Severe[b]
Indene Tripropylamine	0.54	0.50	—	—	—	Corrosive	24 hr. 20/20 48 hr. 20/20 72 hr. 20/20	5/10 5/10 5/10	74/80 80/80 80/80
Isopropyl N-(3-Chlorophenyl) Carbamate	5.0-7.5[d]	—	—	—	—	—	—	—	—

See end of table for footnotes.

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IN RE: ABRAMS November 1992

RANGE-FINDING TOXICITY DATA (Continued)

Material	Single Oral LD_{50}-Rats (gm/kg)[a]	Single Skin Pen. LD_{50}-Rabbits (gm/kg)[a]	Inhalation by Rats Conc.	Time	Mortality	Irritation to Rabbit Skin (Draize Units)	Irritation to Rabbit Eye (Draize Units) Conj.	Iris	Cornea
Amines & Nitrogen Compounds: (Con't)									
N, N, N', N'-Tetrakis (2-dihydroxyboroxy-propyl) ethylene-diamine	4.93	>3.98	—	—	—	0	24 hr. 1/20 48 hr. 0/20 72 hr. 0/20	0/10 0/10 0/10	0/80 0/80 0/80
Miscellaneous:									
1, 2-Bis (3, 7-dimethyl-5-n-butoxy-1-aza-5-bora-4, 6-dioxocyclooctyl-1) ethane	5.66	>3.98	—	—	—	5.0	24 hr. 9/20 48 hr. 8/20 72 hr. 5/20	2/10 2/10 2/10	20/80 20/80 20/80
dl-Butadiene Dioxid	0.21	0.80	56 ppm	4 hrs.	LC_{50}	—	—	—	—
Diketene	0.54	6.73	200 ppm 20,000 ppm	1 hr. 1 hr.	0/10 10/10	4.9	24 hr. 20/20 48 hr. 20/20 72 hr. 20/20	5/10 5/10 5/10	70/80 70/80 60/80
2-Hydroxymethyl-2'-carboxybiphenyl	6.50	—	—	—	—	0	Moderate[b]	?[b]	Slight[b]
Phthalazone	0.37	>3.98	—	—	—	0	Slight[b]	Negative[b]	Negative[b]
Trioxane	8.19	>3.98	—	—	—	0	24 hr. 9/20 48 hr. 6/20 72 hr. 4/20	2/10 1/10 0/10	6/80 2/80 2/80

a - Values indicated by > represent the largest dose administered, and there was no mortality at this level.
b - No Draize Scores obtained. Designations of grade based on description of effect rather than quantitative comparisons. In the case of eye tests, 0.5 ml of material was administered rather than 0.1 ml as in present Draize method.
c - Saturated Vapor
d - No constant ratio between dosage levels.
e - Material mixed with Kaolin (73 mg/m³) to produce a dust cloud. Total concentration of TCNA-Kaolin - 184 mg/m³.
f - Static Exposure

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IN RE: ABRAMS November 1992

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Discussion:

The toxic doses and irritation scores given in Table 1 for various materials represent quantitative results on animals from specified test procedures. To the person familiar with the procedures, the doses and scores have approximate meanings in terms of hazard to man. However, in the interest of providing guidelines to persons unfamiliar with extrapolation of animal data, it was felt worthwhile to make some interpretive comments.

With respect to toxicity, from swallowing, skin penetration and inhalation, Hodge and Sterner[8] have suggested the use of toxicity classes with a commonly used designation for certain dose ranges and have indicated a probable lethal oral dose for man on the basis of animal data. If data on humans indicate a variance, either positively or negatively, such data will, of course, take precedence. The Hodge and Sterner tabulation of toxicity classes is given in Table 2.

The Federal Hazardous Substances Labeling Act makes use of a slightly different grouping of toxic doses. It designates as "highly toxic" those substances wherein, for half or more than half of a statistically significant group of animals, the lethal oral dose to rats is 50 mg/kg or less, the lethal dermal penetration in rabbits is 200 mg/kg or less, and the lethal concentration to rats exposed for one hour is 200 ppm or less by volume of gas or vapor or 2 mg/l or less of mist or dust. Further, it designates as "toxic" those substances with lethal doses greater than those of the "highly toxic" category but less than 5 gm/kg for oral doses to rats, less than 2 gm/kg for dermal penetration on rabbits, and less than 20,000 ppm by gas or vapor or less than 200 mg/l of mist or dust for rats exposed for one hour.

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Table 2

COMBINED TABULATION OF TOXICITY CLASSES*[8]

Various Routes of Administration				
Commonly Used Term	LD_{50} Single Oral** Dose Rats	Inhalation 4 hr Vapor Exposure Mortality 2/6-4/6 Rats	LD_{50} Skin Rabbits	Probable Lethal Dose for Man
Extremely toxic	1 mg or less per kg	10 ppm	5 mg or less per kg	A taste, 1 grain
Highly toxic	1-50 mg	10-100	5-43 mg	1 tsp. 4 cc
Moderately toxic	50-500 mg	100-1000	44-340 mg	1 ounce 30 gm
Slightly toxic	0.5-5 g	1000-10,000	.35-2.81 g/kg	1 pint 250 gm
Practically non-toxic	5-15 g	10,000-100,000	2.82-22.59 g/kg	1 quart
Relatively harmless	15 g and more	100,000	22.6 or more g/kg	> 1 quart

* Hodge, H.C. and Sterner, J. H. American Industrial Hygiene Association Quarterly, 10:4, 93, Dec. 1943.

** Standards for intravenous LD_{50} for rats and rabbits may be obtained approximately by dividing the oral toxicity standards for rats by 10.

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With respect to interpretation of dermal irritation scores, materials tested by the prescribed techniques of the FHSLA and yielding Draize scores of 5.0 or greater are designated "primary irritants" and must bear appropriate labeling if they are considered "household chemicals." The practice of labeling industrial chemicals follows the same criterion in general. Draize scores of less than 5.0 merely show the relative irritation potential. While not standardized, some toxicologists have utilized an arbitrary procedure wherein a score of less than 0.5 is insignificant, 0.5-2.0 represents mild irritation, 2.0-5.0 represents moderate irritation, and greater than 5.0 represents severe irritation.

A corrosive substance is one that causes visible destruction or irreversible alterations in the tissue at the site of contact. A substance would be considered corrosive either by human experience that tissue destruction occurs or, if when tested on rabbits by the Draize technique discussed above, the animal skin is destroyed or irreversibly changed in 24 hours or less.

The scoring of eye irritation tests is rather complicated and a complete explanation here might be more confusing than helpful. Perhaps it will be sufficient to suggest that any effect on cornea or lens represents an undesirable condition and average scores of 10/20 or greater for the conjunctivae represent fairly intense irritation. One must not, however, overlook the importance of progression of scores with time. While one material may produce an effect which is rapidly reversible with the eye regaining normal or near normal appearance within 48 to 72 hours, another material may not recover but may become worse with time.

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All of the above points, oral toxicity, dermal toxicity, inhalation toxicity, dermal irritation and eye irritation, need to be considered in the assessment of potential hazard from a chemical and the need for caution and/or protective equipment during handling. The likelihood of contact and possible damage must be postulated in terms of the use (amounts and frequency) and toxic or irritant potential of the substance. Each manufacturer and user of hazardous substances must analyze his own process and draw his own conclusions (possibly with the help of qualified industrial hygiene personnel).

References

1. Smyth, H.F., Jr. and Carpenter, C.P.: Place of the Range-Finding Test in the Industrial Toxicology Laboratory, J. Indust. Hyg. & Toxicol. 26: 269, 1944.

2. Smyth, H.F., Jr. and Carpenter, C.P.: Further Experience with the Range-Finding Test in the Industrial Toxicology Laboratory, J. Indust. Hyg. & Toxicol. 30: 63, 1948.

3. Smyth, H.F., Jr., Carpenter, C.P., and Weil, C.S.: Range-Finding Toxicity Data: List III, J. Indust. Hyg. & Toxicol. 31: 60, 1949.

4. Smyth, H.F., Jr., Carpenter, C.P., and Weil, C.S.: Range-Finding Toxicity Data: List IV, AMA Arch. Indust. Hyg. & Occ. Med. 4:119, 1951.

5. Smyth, H.F., Jr., Carpenter, C.P., Weil, C.S., and Pozzani, U.C.: Range-Finding Toxicity Data: List V, AMA Arch. Indust. Hyg. & Occ. Med. 10: 61, 1954.

6. Smyth, H.F., Jr., Carpenter, C.P., Weil, C.S., Pozzani, U.C. and Striegel, J.A.: Range-Finding Toxicity Data: List VI, Amer. Indust. Hyg. Assoc. J. 23: 95, 1962.

7. National Academy of Sciences—National Research Council: Principles and Procedures for Evaluating the Toxicity of Household Substances, Publication 1138, Washington, D.C., 1964.

8. Hodge, H.C. and Sterner, J.H.: Tabulation of Toxicity Classes, American Industrial Hygiene Association Quarterly, 10:4, 93, Dec. 1943.

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IN REPLY REFER TO: ARMS November 1982

HWBB-0020067

NWBB-0020068

IN THE ARCHIVES November 1992

INDUSTRIAL HYGIENE FEATURES

Periodic health evaluation and some developments and practices are discussed in Abst. No. 120.

Abst. No. 125 surveys the behavioral implications of exposure to industrial chemicals.

Abst. No. 126 examines the indices of heart rate as substitutes for respiratory calorimetry.

The main functions of the pulmonary circulation are discussed in Abst. No. 132.

Abst. No. 140 investigates cigarette smoking and respiratory infections in a class of student nurses.

Abst. No. 145 is concerned with talc granulomas of the skin.

Information on lanolin dermatitis is given in Abst. No. 146.

Abst. No. 151 reports on carcinogens in a cracked petroleum residuum.

Information on sodium in drinking water a pitfall in maintenance of low sodium diet is given in Abst. No. 158.

Abst. No. 162 presents a case of acute iron intoxication which was treated by chelation.

Chronic toxicity of gadolinium oxide is described in Abst. No. 164.

Abst. No. 166 gives details on mercury exposure in a jewelry molding process.

Permanent encephalopathy from toluene inhalation is discussed in Abst. No. 169.

Details concerning graphite pneumoconiosis of electrotypers are given in Abst. No. 177.

Abst. No. 180 discusses thesaurosis and pulmonary function studies in beauticians.

A report on fiberglass conjunctivitis and keratitis is detailed in Abst. No. 181.

FOUNDATION FACTS

NEW MEMBERS: The Foundation is pleased to add the names of The American Welding & Manufacturing Company, Standard Oil Company (Indiana), and Westinghouse Air Brake Division, Westinghouse Air Brake Company to membership.

MEETINGS: A Chemical-Toxicological Committee sponsored Threshold Limit Values Workshop on February 2, attended by 40 registrants, was chaired by Dr. Emil A. Pfitzer of the University of Cincinnati's Kettering Laboratory. Dr. H.E. Stokinger (Chairman of the American Conference of Governmental Industrial Hygienists Threshold Limit Committee) was principal speaker and presented documentation in support of 1967 intended changes. He advised of a proposal that in the future the old values be retained under "Recommended Values" and intended changes appear only as a "Statement of Intent." If adopted, this should help forestall transposition of new tentative values to serve in the place of values formerly recommended, especially where these are used in legal codes. There appeared to be unanimous endorsement of this proposal by those present and Dr. Stokinger expects that his committee may be inclined to act favorably upon it. Dr. John A. Zapp, Director of duPont's Haskell Laboratory, is a member of the American Industrial Hygiene Association-American Conference of Governmental Industrial Hygienists Committee on Threshold Limits, which has proposed a revision to the preface to the Threshold Limit Values. Dr. Zapp discussed the rationale for the proposed modification, indicating that it would better fit the needs of users, and be less likely to be misconstrued if introduced into legal codes. Mr. T.F. Hatch, Professor Emeritus of the University of Pittsburgh, Graduate School of Public Health, said the most precious possession of the industrial hygienist is the knowledge that individuals may be exposed to contamination below certain levels without adverse health effects. Professor Hatch argued against inclusion of limits based on considerations other than health in the Threshold Limit list. There was general agreement that separate listing of substances for purposes of health versus housekeeping is essential to proper understanding and use of Threshold Limit Values.

At a meeting of the Board of Governors of Asbestos Textile Institute at Cherry Hill, N.J., February 9, Dr. deTreville reported progress on the Foundation's research on fibrous dusts, including asbestos. (Medical Series Bulletin No.11, distributed in December 1966, and entitled "Asbestos Bioeffects Research for Industry" describes these studies.)

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03122398

February, 1967
Volume XXXI
No. 2

Industrial Hygiene Foundation
4400 Fifth Avenue
Pittsburgh, Pa. 15213

MWBB-002U069

NOVEMBER 1982

IN USE AIR AIMS

INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

97 The Soap and Detergent Association Survey Highlights Need For Employee Cleanliness Programs in Industry.

According to questionnaires completed and returned by 69 industrial medical directors representing 220,000 workers in about 100 plants in 1964, skin health hazards are present in almost every form of industrial endeavor. Principal causes of skin irritations included plastics and synthetic resins—55%, (Within this group, and of greater concern because of the hazards involved, 82% are handling epoxy resins);solvents and lubricants—77%; acids—75%; alkalies and cements—75%; greases and lubricants—67%; and cutting and cooling oils—58%. Others, potentially harmful to the skin, in regular use are: biologic agents—5%; chromates and chromic acid—40%; cleaning compounds—68%; coal tar products—33%; dyes and dye intermediates—26%; furs and hides—2%; metals and metal plating—34%; paints and varnishes—56%; plants and woods—7%; rubber and its compounds—26%; and vegetable oils, fats and waxes—34%. Manufacturers of chemicals and allied products constituted the largest single industry whose plants were surveyed. Every one of the companies surveyed provide their employees with hand washing products. Some make available two, three and even four different types for efficient removal of all kinds of soil. Employees are cooperating with employers to keep skin troubles out of their plants—only seven of the medical directors felt that the wash-up facilities provided were insufficiently utilized by production workers. Speakers and visual aids on plant and personal hygiene are available according to the organization which made the survey: The Soap and Detergent Association, Industrial Division, 295 Madison Avenue, New York, N.Y. 10017.

98 Asbestos-Dust Deaths Rising in PHS Study.

Exposure to high levels of asbestos dust 20 to 30 years ago was probably responsible for a 21% increase in the death rate among certain workers in a large group recently studied by the U.S. Public Health Service. This excess mortality—in the asbestos textile industry—was due to cancer of the lung and gastrointestinal tract and to asbestosis. The report was presented to experts on environmental disease attending a Conference on Asbestos Research sponsored by occupational health officials of the Public Health Service in Cincinnati. "While dust levels have been sharply reduced in the asbestos textile industry, the finding adds to the growing evidence that asbestos exposure is associated with cancer of the lung," said Dr. Murray C. Brown, chief of the Division of Occupational Health. Dr. Brown's report was based on research being conducted by Dr. Philip Enterline, of McGill University, and Dr. Mildred Kendrick, of the Division.
-- Medical News 1, 3 (Jan. 2, 1967)

99 Fluorides May be Useful in Preventing Atherosclerosis and Osteoporosis.

Fluorides in drinking water may help to prevent hardening of the arteries and to reduce osteoporosis, Dr. Mark Hegsted of the Harvard School of Public Health told the annual meeting of the American Dietetic Association at the Sheraton Boston Hotel. He was reporting on a study of 1,000 North Dakota residents over 45 years of age. Three hundred lived in an area with high natural fluoride content in the water, the remaining 700 in a low fluoride area. All had x-rays of their spines and, incidently, of their aortas, during an investigation of osteoporosis, calcium loss in the bone. It was the x-rays of the aortas, primarily an after thought, that disclosed there were far fewer cases of calcium deposit in the people from the high fluoride areas. Calcification of arteries, often present in the last stages of atherosclerosis, is commonly a precursor of arteriosclerosis or hardening of the arteries. Assuming that the North Dakota findings can be confirmed, Dr. Hegsted said, the data indicated that somehow fluoride helps to keep the calcium in the bone and prevent its deposition in the blood vessels, where it does not belong. In the high fluoride areas there was substantially less osteoporosis, whether judged from the relative bone density or from the presence or absence of collapsed vertebrae. In low fluoride areas, reduced bone density was very prevalent in older women, reaching 85% in those 65 or over, much higher than in men in the same area. In the high fluoride area the difference between the sexes was less, suggesting that fluoride is markedly effective in women but relatively unimportant in men. Further investigation is needed to determine how much fluoride should be added to drinking water to prevent osteoporosis.
-- Conn. Health Bull. 80, 302 (Dec. 1966)

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100 Aflatoxin.

Aflatoxin, the cancer-causing agent found in edible nuts, has been fully characterized as mutagenic and carcinogenic by a team of Food and Drug Administration (FDA) scientists. FDA's Bureau of Science group, headed by Dr. Marvin Ligator, says the agent causes breakage at the long arm of chromosomes, apparently through an alkylating complex with deoxyribonucleic acid. Dr. Ligator's work, performed with white blood cells and kangaroo rat kidney cells, is the first aflatoxin study on mammalian cells. It complements the DNA complex research on the mycotoxin performed by Dr. A.W. Wogan at the Massachusetts Institute of Technology. Aflatoxin's cancer-causing properties have thrown scares into the peanut industry, which now is effectively monitoring its products. -- Chem. Eng. News 45, 33 (Jan. 23, 1967)

101 Smog Chamber to be Constructed.

The construction of a smog chamber is planned to begin this month (January) at the Battelle Memorial Institute, Columbus, Ohio. The National Paint, Varnish and Lacquer Association (NPVLA) has agreed to finance operation of the chamber for three years as part of its program of pollution abatement. During this time, the chamber will be used for evaluating smog-forming tendencies of organic solvent vapors. The Battelle unit will be only the sixth smog chamber in this country having a capacity of more than 100 cubic feet.

-- Chem. Eng. News 45, 47 (Jan. 16, 1967)

102 Occupational Health Nursing.

The American Nurses' Association has announced the publication and availability of a report prepared by a Special Committee to Identify Occupational Health Nursing. This publication is entitled Selected Areas of Knowledge or Skill Basic to Effective Practice of Occupational Health Nursing. It is available free in limited quantities, from the American Nurses' Association, Inc., 10 Columbus Circle, New York, N.Y. 10019. Please specify publication I-25 when requesting. The publication contains a section listing and briefly discussing the distinctive characteristics of occupational health nursing and follows this with a survey of the many-faceted skills and knowledge which the occupational health nurse must possess. The publication defines the practice of occupational health nursing and provides a summation of basic concepts which can be useful in both nursing education and practice. (See Ind. Hyg. Digest 30:10, p. 3-4, Oct. 1966.)

-- Am. Ind. Hyg. Assn. J. 27, 532 (Nov.-Dec. 1966)

103 Alcoholism in Industry.

A 24-page booklet entitled Alcoholism in Industry, recently released by the Industrial Medical Association, tells how to recognize and manage problem drinkers in industry and details of starting an industrial alcoholism program. Copies of the booklet are available at $1.00 each from the Industrial Medical Association, 55 East Washington Street, Chicago, Illinois 60602.

-- Am. Ind. Hyg. Assn. J. 27, 558 (Nov.-Dec. 1966)

104 American Industrial Health Conference.

The 1967 American Industrial Health Conference will meet April 10-13, 1967 in New York City with headquarters at the Americana Hotel. The Conference is cosponsored by the Industrial Medical Association and the American Association of Industrial Nurses. Further information may be obtained by writing to the American Industrial Health Conference, 55 East Washington Street, Chicago, Illinois 60602. -- Am. Ind. Hyg. Assn. J. 27, A-4 (Nov.-Dec. 1966)

105 National Congress on Environmental Health Management.

The National Congress on Environmental Health Management will be conducted by the American Medical Association in New York City, April 24-26, 1967 at the Hotel Americana. The Congress is convened to explore the varied aspects of the management approach to environmental health problems. For further information write to the Department of Environmental Health, American Medical Association, 535 North Dearborn Street, Chicago, Illinois 60610.

-- Am. Ind. Hyg. Assn. J. 27, A-4 (Nov.-Dec. 1966)

106 Hygienic Guide Series.

The following additional Hygienic Guide Series are now available: Ethyl Acrylate (Ethyl Propenoate) $CH_2 = CHCOOC_2H_5$ and Ethylene Glycol Dinitrate (Nitroglycol, Dinitroglycol, EGDN, EGN, Ethylene Nitrate) $C_2H_4(ONO_2)_2$. They are given in the November-December 1966 AIHA Journal pages 571-577 and can be obtained from the American Industrial Hygiene Association, 14125 Prevost, Detroit, Michigan 48227, at 50 cents each. -- Am. Ind. Hyg. Assn. J. 27, 571-577 (Nov.-Dec. 1966)

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COMING EVENTS

107	Mar. 1- 3	International Conference on "Malnutrition, Learning and Behavior," Cambridge, Mass.
	Mar. 4-11	CAMDA (Canadian-American Medical and Dental Association) Vail, Colo.
	Mar. 5- 9	International Anesthesia Research Society (41st Congress) Bal Harbour, Fla.
	Mar. 9-11	AMA-ABA National Medicolegal Symposium, Miami Beach, Fla.
	Mar. 10-11	National Conference on Rural Health (20th), Charlotte, N.C.
	Mar. 10-12	American Association of Pathologists and Bacteriologists, Washington, D.C.
	Mar. 12-15	International Academy of Pathology, Washington, D.C.
	Mar. 19-24	American College of Allergists, New Orleans, La.
	Mar. 21-31	American College Health Association, Washington, D.C.
	Mar. 22-25	American Orthopsychiatric Association, Washington, D.C.
	Mar. 23-25	Society of Toxicology, Atlanta, Ga.
	Mar. 29-Apr. 1	Conference on the Microcirculation as Related to Shock, Boston, Mass.
	Mar. 30-Apr. 5	American Leprosy Missions—USPHS Seminar on Leprosy, Carville, La.
	Mar. 31-Apr. 1	Annual Midwest Cancer Conference, Wichita, Kan.

LEGAL DEVELOPMENTS

108 Federal Grants for Air Pollution Control Programs.

On January 26, 1967, the National Center for Air Pollution Control of the Public Health Service announced three regional meetings to discuss proposed rules for awarding of Federal grants to help maintain effective air pollution control programs at the local, State, and regional levels of government. Also scheduled for discussion at the meetings are proposed certification procedures involved in establishing eligibility for the Federal tax credit now available for air pollution control equipment installed by private firms. The meetings were to be held as follows: San Francisco, January 27, State Office Building, 455 Golden Gate Avenue; Kansas City, Missouri, January 30, New Federal Office Building, 601 East 12th Street; and New York, February 2, offices of the Federal Trade Commission, 30 Church Street. The major purpose of the meetings was to give State and local officials an opportunity to present their views on proposed regulations for awarding of air pollution control program maintenance grants, as authorized by the October 1966 amendments to the Clean Air Act. Tax credit is provided under provisions of Public Law 89-800, passed in November 1966. This legislation suspended the seven percent credit that had been available for investment in new commercial and industrial facilities, but it stipulated that the credit remain available for air and water pollution control facilities. To qualify under the law, air pollution control equipment must be used primarily to remove, alter, or dispose of air pollutants; in addition, it must be certified both by the appropriate State air pollution control agency as being in conformity with applicable State regulations and by the Secretary of Health, Education, and Welfare as being in compliance with applicable Federal regulations and the general policies of the Federal Government with respect to cooperation with States in the prevention and control of air pollution. Proposed rules for certification by the Secretary will be discussed. Further information may be obtained from Mr. Charles D. Yaffe, Chief of the Office of Program and Survey Grants of the National Center for Air Pollution Control.-- U.S. Department of Health, Education, and Welfare, Public Health Service, Washington, D.C. 20201.

109 Cobalt-Containing Drugs.

Cobalt-containing drugs for treating iron-deficiency anemia have been withdrawn from the market at the request of the Food and Drug Administration (FDA). A panel of hematologists will be set up by FDA to determine whether there are any conditions under which these drugs may be used safely and effectively. In an unrelated development, Chas. Pfizer has withdrawn its veterinary antibiotic preparation Mastalone because residues were found in milk from cows treated (for mastitis, an udder infection) after the time specified for the milk to be discarded. Hailing Pfizer's voluntary action, Dr. James L. Goddard, Commissioner of FDA, says, "It is a good example of self-regulation by a manufacturer in the interest of protecting the public health."

-- Chem. Eng. News 45, 29 (Jan. 23, 1967)

110 Labels on Irradiated Foods.

The Food and Drug Administration (FDA) has issued the final rules for labels to be used on irradiated foods. The FDA says that comments received after the rules were proposed in mid-1966 are not significant enough to warrant a public hearing on the subject. It turned down a proposal that "pasteurized" be used instead of "treated" and that "sterilized" be substituted for

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"processed." The agency claims that the commonly accepted meanings "pasteurized" and "sterilized" do not apply to the status of irradiated foods. The FDA agreed that the radiation (gamma, X, or electron) be specified. -- Chem. Eng. News 45, 35 (Jan. 16, 1967)

BOOKS, PAMPHLETS, AND NOTICES

111 Environmental Biology. P.L. Altman and Dorothy S. Dittmer, Editors. AVAILABLE FROM: Federation of American Societies for Experimental Biology, 9650 Rockville Pike, Bethesda, Maryland 20014. 694 pp. (1966). PRICE: $15.00.

This volume, one of a series of handbooks prepared for use by specialists and published by the Federation of American Societies for Experimental Biology presents quantitative and qualitative data on effects of environmental factors on man, other animals, and plants, specifically compiled for reference purposes. Most of the tables, graphs, and diagrams (totaling 190) were contributed especially for the Biological Handbooks series by outstanding scientists from their own collections of data and from the current literature. Contents of the volume have been authenticated by 450 leading investigators in the fields of botany, zoology, and medicine. The review process to which the data have been subjected was designed to eliminate, insofar as possible, unacceptable material and errors of transcription. Tables of interest to those in Occupational Health and Environmental Pollution Control activities in industry are found in chapters on Temperature; Radiant Energy; Sound, Vibration and Impact; Acceleration and Gravity; Atmosphere and Pollutants; and Atmospheric Pressures and Gases, all of which contain references to human factors and tolerances. It is interesting that the chapter on Water (pages 455-564) makes no reference to Quality Criteria, however (See Industrial Hygiene Digest 30:1 p.4, January 1966). "Pneumoconioses" is not mentioned in the index, nor are "disease" or "occupational." On the other hand "emphysema" appears with subheadings "acceleration; air pollution—engine exhaust, gases and vapors; decompression; and impact." Under "Pneumonitis: air pollution" are listed "acute exposure, gases and vapors; particulates and petroleum asphalt." "Maximum Breathing Capacity" is listed with "air pollution; divers, resting; and gaseous ions" but there is no mention of Maximum Acceptable Concentrations or Threshold Limit Values. "Although this reference is obviously not concerned with occupational health per se, industrial hygienists should be aware of its existence and scope of coverage." --RTPdeT

112 Civil Defense: Planning For Survival and Recovery. National Security Management. D.W. Mitchell. Industrial College of the Armed Forces, Washington, D.C. AVAILABLE FROM: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. 217 pp. (1966). PRICE: Not Given.

This text discusses the nature of the nuclear threat: the evolution of the United States civil defense program; and the problems anticipated and the preparedness measures taken and contemplated to protect lives and property, to insure the continuity of government at all levels, and to maintain or restore services and facilities essential to survival and recovery from a thermonuclear attack. Since 1961 especially, the essential components of an effective civil defense program—designed to protect the large group of people who would survive the blast and heat effects of a nuclear attack if only they could be safeguarded from radioactive fallout—have been put in place. That program is now adequately based and sufficiently broad to accommodate expansion and improvement. The central focus of the present effort is to develop it further and to prepare to put it to effective use in the event of a nuclear attack. The table of contents includes chapters on: The Nature of the Threat; The Development of Civil Defense; The New Image of Civil Defense; Postattack Rehabilitation; and Civil Defense Studies and Proposals. In chapters IV and V the following subtitles will be of special interest to those in industry: Resource Management During Recovery; Essential Services; Manufacturing; Construction; The RAND Recommendations; The Economics of Civil Defense; and Civil Defense—Project Harbor Summary Report. An appendix includes: (1) The Federal Civil Defense Act of 1950, as Amended. (2) The President's Civil Defense Message, May 25, 1961. (3) Executive Order 10952, as Amended. (4) Department of Defense Directive No. 3025, March 29, 1965, subject: Military Support of Civil Defense. Suggestions for further reading are given.

113 Programmed Cleaning and Sanitation. J.C. Gardner, Editor. AVAILABLE FROM: The Soap and Detergent Association, 295 Madison Avenue, New York, N.Y. 10017. 56 pp. (1966). PRICE: Not Given.

Maintenance of sanitation in buildings, the selection of cleaning materials for these purposes, and the organization and supervision of the cleaning program are becoming increasingly complex and needful of a higher order of handling. This booklet describes these problems and gives helpful information and guidance for their solution, directed to the management level; it is not intended

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as a janitorial handbook. Modern management is not only concerned with the costs of sanitation maintenance, but with the economies in production, the support of quality, and the promotion of employee morale, which result from clean and orderly work places. Rising capital investments in better plants, machines, and personnel facilities not only warrant but require maintenance of similar caliber. Just as a clean and attractive home is evidence of a family's pride, thrift and energy, so do clean factories, stores, office buildings, schools and institutions reflect competence of management; furthermore, a sense of social responsibility is thereby exemplified which is an essential element in our rising standards for living and working. If one in thirty represents a conservative ratio of those engaged in cleaning maintenance to those employed, we are concerned with the labor of over 2,000,000 persons. With 19,200,000 man (and women) hours applied each working day to the cleaning of buildings and equipment, at a labor cost of $1.50 per hour, in 250 working days, the annual labor cost is estimated to be $7,200,000,000. Well planned and organized industrial sanitation pays its way, not necessarily by reducing expenditures for sanitary maintenance (although this is frequently the result) but by enabling production and machine maintenance to be done with greater efficiency, and employees to work in greater comfort and safety. The office building, commercial establishment, public facility, or institution differ from the industrial plant only in that the rendering of service or the performing of desk work takes the places of production; mechanical maintenance becomes a lesser function, and sanitation maintenance increases in importance, thus placing greater emphasis on the efficiency and economy of the sanitation function, and calling for more expert supervision. In the non-industrial operation, mechanical and sanitation maintenance may be more readily combined under one supervision, as in a school system. Various methods of dust collection and removal, even though efficient in the range of 80 to 99 plus percent, still permit substantial quantities of dusts to escape or remain in the atmosphere and to be deposited on surfaces from which they must be removed. While those who are maintaining office and institutional buildings do not have the massive dust problems of some industrial plants, they still have the continual load of dust characteristic of all urban areas, varying usually from 1 to 10 million particles per cubic foot. Quantitatively, fairly clean city areas may have solids loadings in the atmosphere from 0.4 to 0.8 grains per 1,000 cu.ft. of air; city industrial sections may range from 1.0 to 2.0 grains, and heavy industrial areas from 4.0 to 80 grains. On the basis of the intermediate loading of 1.0 grain per 1,000 cu.ft., one pound of soil would be carried into an industrial enclosure with every 7,000,000 cu.ft. of outside air. While some of this air-borne soil will be carried out by the air change, some of it joins the dusts and fumes being generated within and creates the condition which normally requires each day some form of cleaning of horizontal surfaces in the lower part of the room, and periodically a cleaning or renewal of all of the room surfaces. "Clean rooms" demand the extremely high standards of environmental control and cleanliness necessary for their proper function in the process of assembling, testing and repairing of precision instruments and other highly sophisticated devices requiring infinitesimal tolerances. Special attention must be given to the selection of highly motivated and above average personnel for this job. Exacting standards, written work procedures and very selective equipment and materials must be used. Such operations are essential to our space and missile program and require the highest caliber supervision. (A United States Air Force Technical Manual, T.O. 00-25-203, deals with clean room standards.)

114 Preliminary Report on Microbiological Studies in a Laminar Down-Flow Clean Room. Research Report SC-RR-65-47. V.E. Arnold, et al. AVAILABLE FROM: Sandia Corporation, Albuquerque, New Mexico. 27 pp. (Jan. 1965). PRICE: Not Given.

Based on a preliminary investigation (and an independent confirmation study), it appears that the potential of the Sandia laminar down-flow clean room to control airborne microbiological contamination (bacteria and fungi) is approaching the absolute. Because of the significance of this information, it is reported before further tests are performed. In the original series of tests performed in the Sandia clean room, no bacteria or fungi spores were introduced as test organism. Only those organisms were used which were naturally present in the atmosphere and those which were inadvertently introduced by personnel performing the tests. In the confirmation study, tracer bacteria were introduced in one series as additional proof. Based on the results of the experiments reported here, it can be stated conclusively that the Sandia laminar down-flow clean room—using filtration and airflow control alone—can control airborne bacteria and fungi as successfully as it can airborne dust and droplets.

115 Cleanliness Meter and its Application to Solvent Cleaning. Reprint SC-R-66-865. (March, 1966). R.C. Marsh and F.W. Oswalt. AVAILABLE FROM: Technical Information Division III, Sandia Corporation, Albuquerque, New Mexico. 27 pp. (1966). PRICE: Not Given.

This paper describes the development and application of a new instrument which will measure the soluble residue content of volatile cleaning solvents. The instrument, called the Solvent Purity

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Meter, is capable of giving an instantaneous and continuous read-out of residues as low as one part per million and may be used either for batch sampling or as an on-line continuous monitor for recirculating cleaning systems. Typical laboratory studies using the meter, as well as results from in-process cleanliness testing applications on component production lines, are discussed. Evaluations of the instrument, to date, have shown it to be a useful production line monitor for testing the purity of cleaning solvents, as an indirect measure of component cleanliness, and for pointing out errors or problem areas when troubleshooting component cleaning problems.

116 Clean Room and Work Station Requirements, Controlled Environment. Federal Standard No. 209a, Aug. 10, 1966. Superseding Fed. Std. No. 209, Dec. 16, 1963. General Services Administration. AVAILABLE FROM: General Services Administration, Specifications Activity, Printed Materials Supply Division, Bldg. 197, Naval Weapons Plant, Washington, D.C. 20407. pp. I-II and 1-21. PRICE: 15 cents.

In recent years, components and systems have become more sophisticated. This sophistication has brought with it many new requirements, one of which is the demand for new cleanliness standards. Manufacturing facilities providing the environmental control necessary for this type of cleanliness are known as clean rooms, white rooms, and dust controlled facilities. Thus, a clean room may be: "A space in which airborne contamination, and if needed, temperature and humidity are controlled to a far higher degreee than conventional air-conditioned areas." Many industrial corporations, educational institutions, and governmental agencies have contributed to the advancement of the state-of-the-art clean room design and operation without adequate standardization. The need for standardization of definitions and levels of environmental control is now recognized.

117 Fire Protection Guide on Hazardous Materials. National Fire Protection Association. AVAILABLE FROM: National Fire Protection Association, 60 Batterymarch Street, Boston, Mass. 02110. 768pp. (1966). PRICE: $4.75.

This work, which is a collection in a single volume of five indispensable reference manuals, has recently been published by the National Fire Protection Association. The content of the new guide is as follows: Flash Point Index of Trade Name Liquids (NFPA No. 325A) listing flash points of more than 6,300 trade name products; Fire Hazard Properties of Flammable Liquids, Gases and Volatile Solids (NFPA No. 325M) summarizing available data on more than 1,100 substances, listed alphabetically; Hazardous Chemicals Data (NFPA No. 49) covering more than 500 chemicals which have a health or reactivity hazard or present unusual storage or fire fighting problems; Manual of Hazardous Chemical Reactions (NFPA No. 491M) listing alphabetically by chemical name the mixtures of two or more chemicals reported to be potentially dangerous as causes of fires, explosions or detonations; and Recommended System for the Identification of the Fire Hazards of Materials (NFPA No. 704M) describing the Hazard Index which simplifies identification of type and degree of health, flammability and reactivity hazard of materials; particularly in industrial and storage situations where fire hazards of materials may not be readily apparent. This authoritative reference volume has been designed for persons inspecting, handling, using, storing, pre-planning or fighting fires in chemicals (including flammable liquids, gases and volatile solids.

INDUSTRIAL MEDICAL PRACTICE

118 The Teaching of Occupational Health in Israel. K. Dror. Arch. Environmental Health 13, 220-222 (Aug. 1966).

Teaching of occupational health has progressed in Israel, in spite of the lack of a properly equipped, staffed and endowed institute of occupational health. In order to put this teaching on a firm basis, including research and contact with clinical teaching, it seems highly urgent to create such an institute of occupational health for purposes of service, teaching, and research. Such an institute, as an organic part of medical schools and their hospitals, would represent the experts' center for problems of occupational health for the whole teaching body and a place for the specialist to familiarize himself with the day-to-day problems of occupational health, methods used, and research performed. There are 10 references. -- Author's conclusions

119 Closed-Circuit Television. A Communication Technique for Industrial Medical Departments. G.H. Collings, Jr. J. Occ. Med. 8, 578-580 (Nov. 1966).

As facilities become more generally available for closed-circuit television (CCTV), large industry is finding this medium ideal for management communication between plants, offices, or other divisions of the corporate enterprise. Similarly, CCTV offers the industrial medical department a degree of communication throughout its often scattered operations which has not been possible

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before. Eventually, linkage of a company CCTV network with external locations such as hospitals, clinics, universities, and even other industrial medical departments will add still further to its usefulness. The first industrial medical conference on CCTV in the New York Telephone Company is described. A total of 25 company physicians at the four locations or from nearby points participated in the first CCTV seminar. The presentation, plus the discussion among the participants which followed lasted approximately 1-1/2 hours. Future seminars and conferences will explore some of the many other obvious uses for this new communication medium. For example, the stimulation of visiting authorities who may be present at the company medical headquarters may be shared with branch offices of the medical department; special cases which are brought to the attention of the medical director may be discussed with the entire staff; new procedures or techniques may be introduced and explained; and a demonstration of new equipment may be made once, yet be seen by all.

120 Periodic Health Evaluation: Some Developments and Practices. N.J. Roberts. J. Occ. Med. 8, 581-588 (Nov. 1966).

Arrangements can be made to examine any population in depth and detail, if the needed funds, personnel, and facilities are available. However, the best periodic health examination is not necessarily the one that costs the most money, consumes the most time, or includes the most study and testing. The law of diminishing returns is as applicable to periodic examinations as it is to cameras, coats, and cars. To gain the greatest amount for a cost (in terms of money, time, people, and facilities) that can be widely afforded, the most promising routes would seem to be through more efficient and less extensive use of physicians; greater use of nurses, technicians, and especially automation; and development of better examination techniques. In doing periodic health examinations, physicians should be willing to face the somewhat unpalatable proposal that some historical information is better and more economically elicited by a questionnaire completed by the literate patient. A questionnaire*several pages long, with ample wording and spaciousness, can be completed in only 20-30 minutes of the patient's time at home. In addition to helping assure thoroughness, a properly designed questionnaire completed at home with the help of the patient's spouse often gives more information and more accurate information, at least with reference to certain subjects, than we customarily elicit in interviews. For example, most wives remember family and personal histories better than their husbands do and they can often stimulate the admission of a wheeze or of an appreciably more exact estimate of tobacco or alcohol use. Even the best questionnaire has deficiencies, most notably the impossibility of seeing or feeling the patient's reaction to questions which he may not understand or which may be emotionally charged for him. But the effectiveness and depth of an interview can be appreciably increased by structuring it with the help of a questionnaire. As automation techniques become more widely and practically available, valuable information concerning the probability that an individual has certain diseases will be obtainable promptly from his responses to a questionnaire. Such data would help shape the patient's subsequent interview, his physical examination, and the X-ray, laboratory, and other studies performed. Some periodic health examination programs have already moved in this direction. Patients sort into "Yes" and "No" boxes data-processing cards on which individual questions are printed, allowing prompt electronic handling of their responses. (*Samples of such questionnaires are available from the author on request: Dr. Norbert J. Roberts, Associate Medical Director, Standard Oil Co. (N.J.), 30 Rockefeller Plaza, New York, N.Y. 10020.)

121 Some Economic Estimates of Job Disruption—From an Industrial Mental Health Project. W.W. Winslow, et al. Arch. Environmental Health 13, 213-219 (Aug. 1966).

A method of calculating specific costs to industry stemming from job-disruptive behavior is presented. Costs to the company, the employee, and the insurance carriers were calculated based on the following indices: (1) cost of impaired productivity; (2) cost of interpersonal frictions as manifested in grievance, disciplinary, and garnishment procedures; (3) cost of absenteeism; and (4) cost of health and accident problems as manifested in compensation and hospital-medical-surgical claims, and medical-surgical and weekly sick benefit payments. Costs were calculated for suspected problem drinking, miscellaneous problem, and problem-free samples, and cost changes over time were examined for three employee samples based on whether remedial intervention was recommended, followed through, or not followed through. Evidence is presented which demonstrates the significantly higher costs to industry accrued by problem-drinking and other-problem employees. However, this study did not demonstrate the economic value of secondary prevention or early remedial intervention within the relatively short span of follow-up which was possible in this project. There are 22 references. -- Authors' summary

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122 Suicide and Weather. Effect of Barometric Pressure and Humidity. A. D. Pokorny. Arch. Environmental Health 13, 255-256 (Aug. 1966).

This is a report of a partial replication of the study of Digon and Bock (Arch. Environmental Health 12, 279-286 (Mar. 1966)) in which they found significant relationships between suicide and (1) a barometric pressure-humidity combination, and (2) large daily change in barometric pressure. These portions of their study were replicated, using 1960 suicide and suicide attempt data from Houston, to see if these might not have been chance positive findings among the large number of analyses performed. Neither of their findings was confirmed in the present study. The same was true when the same type of analysis was applied to suicide attempts. It therefore appears likely that the two positive findings of Digon and Bock are really chance relationships, and that the negative findings in the remainder of their study are more likely to represent the true relationship between suicide and weather changes. Two references are given. -- Author's summary

123 Personality and Cognitive Characteristics of Engineering Students: Implications for the Occupational Psychiatrist. H. L. Rosett, et al. Am. J. Psychiat. 122 (10), 1147-1152 (1966).

Initial data from a longitudinal study of an entire graduating class at Cooper Union School of Engineering suggest that the concepts of ego psychology and cognitive control (perceiving, recognizing, conceiving, judging, and reasoning), as brought out by appropriate tests, offer a theoretic framework with the potential to encompass many aspects of the productive functioning of scientists in industry. A follow-up study is planned in eight years to determine the practical significance of the preliminary findings that the engineering students showed a predominance of compulsive personality types with high field articulation. The concept of the "clinically normal compulsive personality" who is over-conscientious and has an inordinate capacity for work seems to be descriptive of many effective engineers and scientists. The severity of the compulsive character traits was not significantly related to the cognitive approach. Ultimately industry must adopt a clinical approach in dealing with the uniqueness of the individual scientist.
-- J. Occ. Med. Absts.

124 Your Psychiatric Patient at Work. A. A. McLean. J. Kentucky State Med. Assn. 64 (2), 129-133 (1966).

Work has an increased psychological and social meaning and workers have a greater recognized incidence of psychiatric disorder. Three areas of importance are brought to the attention of people who serve the mental health of the working population. (1) One of the most common prescriptions — time off for emotional disturbance — is incompatible with contemporary thinking in psychiatry, and should be used sparingly when the illness is not completely incapacitating. (2) The industrial medical consultant and industrial management must be aware of the stressful factors impinging upon the life of an employee to intelligently alter his work situation without triggering the development of emotional difficulty. (3) Appropriate medical care for the employee with psychiatric problems requires not drug therapy alone, but drug therapy with more definitive psychological counseling. The overwhelming majority of disrupting emotional disturbances perceived in industry are amenable to treatment. -- J. Occ. Med. Absts.

125 Behavioral Implications of Exposure to Industrial Chemicals. H. V. Brown. J. Occ. Med. 8, 561-566 (Nov. 1966).

When a layman says that a substance is poisonous or toxic, he usually means that it is capable of causing death. An industrial hygienist or an industrial physician describing a toxic material usually implies that it may damage an important organ system such as the liver, lungs, or kidneys. He may possibly mention skin irritation, and, as an afterthought, he may make a comment concerning headaches or dizziness. This order of effects, ranging from severe systemic injury to the minor headaches, is not the order in which they appear in industrially encountered intoxications. Most frequently, the headache and dizziness appear first, then organ damage, and then death. By far the earliest indications of systemic poisoning are the effects on the nervous system. The need for investigating the psychotoxic effects of industrial chemicals has been voiced by a number of people working in the fields of industrial medicine, industrial hygiene, and industrial toxicology. In the face of such interest by nonpsychiatrists, it is surprising to note that little apparent interest in these aspects of industrial mental health has been evidenced by psychiatrists. For example, the author of a recent book on occupational psychiatry devoted less than two pages to a discussion of physical and chemical agents, and another did not even mention the idea that industrial chemicals can affect one's emotional health. Perhaps Kety* was correct when he commented that psychiatrists tend to relegate to medicine or neurology those mental disorders resulting from biochemical agents. He said: ". . . Once a mental disorder is reasonably well understood and has had its etiology and pathogenesis adequately explained, it ceases to be part of psychiatry, as if we insisted that only the mysterious ailments were psychiatric in nature." Although it has been known for centuries that behavioral changes can result from industrially encountered toxic materials, only within

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the last five or six years has any great attention been given to measuring quantitatively the behavioral changes induced in animals in order to predict similar effects in humans. Because psychiatrists do not appear to have much interest in this field, it will become, if only by default, an increasingly important part of occupational medicine. If the industrial physician is sufficiently aware, properly astute, and observant, and if he keeps detailed records, serious intoxications can be prevented by watching for the subtle behavioral changes which usually precede more serious intoxications. There are 35 references. (*Kety, S. The heuristic aspect of psychiatry. Amer. J. Psychiat. 118:385, Nov. 1961.)

126 Indices of Heart Rate as Substitutes For Respiratory Calorimetry. R. B. Andrews. Am. Ind. Hyg. Assn. J. 27, 526-532 (Nov.-Dec. 1966).

The most promising potential substitutes for respiratory calorimetry are regression equations that relate caloric expenditure to heart rate. This study evaluates multiple regression equations, employing seven indices derived from the time pathway of the heart rate, as a means of increasing the precision of the heart rate method. Regression equations are based on the aggregation of different tasks and subjects as well as on the single task and subject. The multiple regression equations are compared with simple regression equations and with respiratory calorimetry in terms of the errors of estimation that each introduces into the measurement of caloric expenditure. The results show that multiple regression equations based on a single subject and single task are as precise as respiratory calorimetry. There are 14 references. -- Author's abst.

127 Hand, Wrist, and Forearm Injuries. The Result of Repetitive Motions. L. Hymovich and Miriam Lindholm. J. Occ. Med. 8, 573-577 (Nov. 1966).

Experience is reported with 47 persons sustaining 62 injuries of hand, wrist, and forearm, attributable to repetitive work in the electronics industry. While most of the injuries were not serious and responded satisfactorily to simple therapeutic measures, some were more resistant, requiring surgical intervention and involving considerable disability as measured in days off work. In two cases, permanent partial disability necessitated the separation of the worker from this type of job. The following program was suggested: (1) An analysis of the hand motions that had been performed by the injured workers to determine whether other methods of doing the same work could be developed and employed by all those doing the same types of work. (2) Proper instruction and continued supervision of each worker doing this type of work to be sure that errors previously made would not be repeated.(This involves repeated review of presently used methods and a course of continuing instruction to the employees.) (3) Use of spring suspension or counterweighting to make heavier tools easier to hold, the substitution of power-activated tools for those that require force in their use, especially for obviating the rotation of the wrist and the moderately great hand force required in using a screwdriver, plus redesigning of tools, where practicable. (4) Rotation of workers among several jobs in the order shown to be most practicable by hand-motion studies, when relief from repetitive motions cannot be provided by the methods given above.

128 Cytodynamics in the Respiratory Tract of the Rat. R.G. Shorter, J.L. Titus, and M.B. Divertie. Thorax (London) 21, 32-37 (Jan. 1966).

The cytodynamics of cells in the respiratory tract have been studied in normal adult Sprague-Dawley rats after the parenteral injection of tritium-labeled thymidine combined with autoroentgenography. The findings in the epithelia of the trachea and large bronchi showed an apparent migratic time of labeled cells of six to seven and seven to eight days, respectively. Nuclear labeling in the epithelial cells of the small bronchi persisted for five to six days. The results indicate that two populations of alveolar macrophages exist, one with a life span of seven days, and the other of two to three weeks. The phase of synthesis of deoxyribonucleic acid (S phase) for the tracheobronchial epithelial cells and alveolar macrophages was eight hours. The classification of the cell population into "renewing cell populations" is discussed. Differences in labeling were seen in bronchi showing purulent bronchitis. -- Am. Rev. Resp. Dis. Absts.

129 Low-Cost Tuberculin Screening for Large Populations. L.M. Hursh. Arch. Environmental Health 13, 622-624 (Nov. 1966).

A rapid, low-cost technique is described for mass tuberculin screening using a jet injector and tuberculin PPD (purified protein derivative of tuberculin; Protoderm) properly diluted. Standardization procedures and statistical analyses were used in accord with the 1958 British Pharmacopoeia. One milliliter of tuberculin PPD Protoderm provided enough purified protein derivative to test over 30,000 patients with a five tuberculin unit dose. A summary of relative costs of several techniques is listed. Three references are given. -- Author's summary

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130 Comparative Responses of Elderly Persons to Aqueous and Depot Influenza Vaccines.
D.W. Voth, H.A. Feldman, and A. Steinschneider.
Arch. Environmental Health 13, 576-585 (Nov. 1966).

After randomly distributing 119 elderly persons into three groups, sera were obtained and each person was injected with either a saline placebo, aqueous, or adjuvant, polyvalent influenza vaccines. By means of the application of the law of initial values, serial HI (hemagglutinating-inhibiting antibodies) titers against nine influenza antigens over a 44-week period demonstrated a greater, more persistent, and broader immunologic response to the repository agent. No serious or residual reactions were observed. The maximal response to a single dose of influenza vaccine was not observed in all vaccinees until some weeks after its administration. Measurements of HI antibodies made on follow-up specimens obtained 14 days after vaccine administration provide incomplete information on the response to it. Antibodies to a 1963 strain of equine influenza virus was demonstrated in 34% of the subjects. There are 15 references. -- Authors' summary

131 Passive Immunization With Gamma Globulin. T.J. McDonagh.
J. Occ. Med. 8, 567-572 (Nov. 1966).

The present concepts and recommendations on the use of human immune serum gamma globulin in passive immunization against measles, rubella, chickenpox, infectious hepatitis, and serum hepatitis are reviewed. Limitations of previously accepted procedures and newer areas of application are discussed, with particular consideration of the problems of immunization for industrial personnel sent to areas of endemic hepatitis. In a limited inquiry into industrial practices, it appears that not many industries have set up a definite program for immunization of their employees who are to visit or reside in areas of endemic hepatitis. A strong case can be made for giving prophylactic gamma globulin to employees under such circumstances. Certainly the policies of the World Health Organization, the Peace Corps, and Army, and the State Department could be cited in support of this proposal. The reports reviewed and the opinions of the majority of medical experts sampled also tend to agree with the use of prophylaxis. It is true, however, that the use of gamma globulin in short- and long-term residency in areas of endemic hepatitis is not as well documented in the literature as the use of gamma globulin in institutions and cases of exposure. Of importance is the absence of a recommendation for the use of gamma globulin in overseas travelers in the authoritative handbook Immunization Information for International Travel, published by the Public Health Service and used as a reference by many industries. However, the reporting of infectious hepatitis is not carried out by the health services of various countries with the same degree of dedication and one would have to define endemic, for the purposes of this potential program, as an incidence of infectious hepatitis many times greater than the rate in the United States. Although some data are available for this type of classification, it certainly is not adequate. Much more information is necessary before a definitive statement can be made about the use of gamma globulin in the modification of infectious hepatitis in overseas personnel. Since this problem affects industry, it may be time for industrial physicians to become more interested in this problem, and to aid in defining it further. An analysis of industrial records, combined with prospective studies of the problem of hepatitis in overseas activities and the results of gamma globulin usage, might add significant information to the literature on this problem, which at the present time is not very extensive. The Public Health Service has expressed an interest in working with industry along these lines.

132 The Main Functions of the Pulmonary Circulation. J.H. Comroe, Jr.
Circulation 33, 146-158 (Jan. 1966).

The five main functions of the lung are discussed in some detail: (1) participation in pulmonary gas exchange, a function long known; (2) service as a blood reservoir for the left ventricle, demonstrated quantitatively only recently; (3) provision for the nutrition of the alveoli and alveolar ducts, discovered in the past two years; (4) filtration of particles from the mixed venous blood (this sometimes results in dysfunction, but is, instead, a function sometimes abused); and (5) removal of excess fluid from the alveoli, known for over 90 years. In the future, unsuspected functions of the lung and the pulmonary circulation may be found. Why, the writer asks, is the lung rich in histamine, heparin, adenosine deaminase, and in certain proteolytic enzymes? Why are leukocytes, separated briefly from blood and then reinjected, trapped preferentially in the pulmonary circulation? Why do certain bacteria, given intravenously, stay in fine pulmonary vessels although they are small enough to pass through any capillary bed? Why do certain diseases of the lung lead to inappropriate secretion of an antidiuretic hormone? Why is bronchial carcinoma often associated with clubbing of the fingers although there is no arterial hypoxia? The answers to these questions will be interesting. -- Am. Rev. Resp. Dis. Abstr.

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133 Metabolism of Pulmonary Phospholipids in Normal Lung and During Acute Pulmonary Edema. W.R. Harlan, Jr., S.I. Said, and C.M. Banerjee. Am. Rev. Resp. Dis. 94, 938-947 (Dec. 1966).

When radiolabeled (C-14 and H-3) palmitic and oleic acids were injected intravenously into normal dogs, the fatty acids were quickly incorporated into pulmonary lipids. Incorporation was four times as rapid for palmitic as for oleic acid, and occurred principally into phospholipids—lecithin and phosphatidyl ethanolamine, and into triglyceride. Following induction of pulmonary edema by intravenous infusion of dextran, there was a significant decrease in total phospholipid and in the radioactivity of phospholipids. The loss of phospholipids was nonselective. Radioactivity was present in the pulmonary edema fluid and its characteristics suggested a mixed origin from pulmonary phospholipid and plasma. Atelectatic areas of edematous lung, having decreased surface activity, also showed significantly less phospholipid and tissue radioactivity than aerated areas. These observations are compatible with an important role for phospholipids, particularly lecithin, in preventing alveolar collapse, and shed some light on the dynamics of pulmonary lipids in the intact animal and during acute pulmonary edema. There are 20 references.-- Authors' summary

134 Urban Factor and Prevalence of Respiratory Symptoms and "Angina Pectoris." R. Cederlöf. Arch. Environmental Health 13, 743-748 (Dec. 1966).

An investigation was performed to elucidate (1) whether urban and rural population groups differ in regard to the prevalence rate of angina pectoris, cough, and bronchitis and, if so, (2) whether these differences can be explained by group incompatibilities with regard to constitutional factors or smoking habits or both. The investigation was based on a population of Swedish same-sex twins born between 1886-1925, provided that both twins in each couple were still alive and living within the country at the time of compilation (1961-1962). The following conclusions were drawn. The prevalence of angina pectoris was higher among smoking men in urban than in rural areas, as judged on the basis of the population sample. This hypermorbidity was less apparent in the analyses according to the twin-control method. The prevalence of the respiratory symptoms was higher among smoking men in urban than in rural areas, as judged on the basis of the population sample as well as on the analyses of the twin pairs (twin-control method). This speaks in favor of a specific urban factor that is in some way interacting with smoking. The study does not reveal what constituent in the urban factor is the causative agent; air pollution must be suspected. There are 19 references. -- Cond. from author's summary

135 Epidemiology of Coronary Disease in Industrial Workers. II. Absentee Rates and Serum Lipids. J.W. Meigs and Margaret J. Albrink. Arch. Environmental Health 13, 645-655 (Nov. 1966).

Absenteeism and serum lipids were studied in a group of 164 male production workers of a factory, in relation to coronary disease. After exclusion of groups with excessive absence rates and men with nonheart disease causes of abnormal serum lipids, 98 men without evidence of IHD were available for comparison with 17 survivors and nonsurvivors of IHD. A number of trends and statistical differences between groups supported the hypothesis that subjects with IHD differed, perhaps genetically, from the normal men, and that the differences point toward underlying factors promoting resistance to noncoronary diseases in some men with a predisposition to ischemic heart disease. There are 22 references. -- Authors' summary

136 Epidemiology of Coronary Disease in Industrial Workers. III. Absentee Rates and Parental Disease Histories. J.W. Meigs. Arch. Environmental Health 13, 655-661 (Nov. 1966).

Absenteeism was studied in relation to reported causes of parental deaths in a group of 98 men, aged 50 and over, and free of diagnosed coronary disease, other atherosclerotic disease, or diabetes over a 12-year period of observation. There was statistical associations between low absentee rates and reported parental death from coronary disease. In general, reported parental death from atherosclerosis or diabetes, as well as coronary disease, associated with lower absentee rates. The results support the hypotheses that genetic factors play a part in the occurrence of ischemic heart disease and that these factors have, under proper environmental circumstances, a potential for health as well as disease. There are 10 references. -- Author's summary

137 Prevention of Urolithiasis. Education to Adequate Fluid Intake in a New Town Situated in the Judean Desert Mountains. M. Frank and A. deVries. Arch. Environmental Health 13, 625-630 (Nov. 1966).

A study was carried out on the effect of education to high fluid intake on urine output and on the incidence of urolithiasis in the newly established town of Arad, situated in the arid Judean desert mountain region. Settlers of the nearby town Beersheba, not subjected to the educational program,

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served as a control. Preliminary results, summarizing a three-year period of study, suggest that education is capable of raising urine output and of preventing urolithiasis in a hot, dry climate. Four references are given. -- Authors' summary

138 Brain Potentials Studied by Computer Analysis. C. Xintaras, et al. Arch. Environmental Health 13, 223-232 (Aug. 1966).

Brain responses to flashes of light in the freely moving rat can be examined with on-line summation techniques (Xintaras, et al., Toxicol. Appl. Pharmacol. 8, 77-87 (1966)). This development encouraged a study to furnish additional information about response morphology, particularly as it might vary as subjects move from alert wakefulness through drowsiness and into deeper stages of spontaneous or induced sleep. Male rats were implanted with cortical and subcortical recording electrodes and placed in an electrically shielded chamber. Photic stimuli were presented to the rat, and conventional EEG recordings obtained. Cortical potentials evoked in response to each light flash were either averaged on-line by computer or recorded on a tape recorder for later averaging. Computer-summated responses (30-350 light flashes) were also graphically displayed by an x-y plotter. In the transition from wakefulness to sleep, specific components of the evoked response were attenuated whereas others were markedly augmented. Carbon monoxide and pentobarbital induced changes in the response that appeared similar to the changes recorded during the subjects normal transition from wakefulness to spontaneous sleep. Consistent relationships were noted between the spontaneous EEG and the magnitude of the visual evoked response. This was particularly evident with wave IV during paradoxical sleep and with wave V during the onset of light sleep. The findings suggest that the alterations in the evoked response during light spontaneous or induced sleep may be associated with a general lowering of the level of vigilance and may be related to the integrative functions necessary to awareness and for processing sensory signals into something meaningful—perception. There are four references. -- Authors' summary

139 Smoking and Cancer of the Urinary Bladder in Males in Poland. J. Staszewski. Brit. J. Cancer 20, 32-35 (March, 1966).

In a retrospectic study, a significant association was found in males between smoking and urinary bladder cancer, as manifested by the percentage of smokers, average intensity of smoking (number of grams of tobacco smoked daily), and the smoking index (number of cigarettes smoked daily multiplied by the duration of smoking in years). The risk of male smokers' developing urinary bladder cancer was 2.7 times greater than that of nonsmokers, a figure close to that found by other investigators. Inhaling of smoke was more common and smoking of pipes or cigars less common for the bladder cancer patients than for the controls. The results of the present study are compatible with the view that cigarette smoking increases the risk of cancer of the urinary bladder. An excess of coal miners and of white collar workers, as well as of individuals with a history of pulmonary tuberculosis or peptic ulcer, was noticed in the group of bladder cancer patients as compared with the control group. -- Am. Rev. Resp. Dis. Absts.

140 Cigarette Smoking and Respiratory Infections in a Class of Student Nurses. J.L. Parnell, D.O. Anderson, and C. Kinnis. New Engl. J. Med. 274, 979-984 (May 5, 1966).

The incidence and duration of pure infections of the upper respiratory tract, tracheitis-bronchitis-pneumonia, and coryza syndrome were determined from September 1, 1963 to August 31, 1964, for two groups of senior student nurses at the Vancouver General Hospital School of Nursing. The comparison groups consisted of 47 students who were regular smokers from September 1, 1963, to May, 1964, when these smoking habits were determined by questionnaire, and a group of 47 nurses who had never smoked regularly. The incidence and incidence rate for respiratory diseases were less in nonsmokers: coryza syndrome and tracheitis-bronchitis-pneumonia were found to occur more often in smokers than in nonsmokers; and the total number of days off duty per student per year was greater for smokers. For nonrespiratory diseases the incidence was also greater in smokers, although the duration was greater in nonsmokers. -- Am. Rev. Resp. Dis. Absts.

141 An Epidemiological Study of Certain Aspects of Lung Cancer in New South Wales. D.L. Jones. Med. J. Australia 1, 765-770 (May 7, 1966).

An epidemiologic study of certain aspects of lung cancer in New South Wales was undertaken for a 12-month period October, 1963 to September, 1964. The following factors were selected for investigation: smoking, chronic bronchitis, previous tuberculosis, residential history, and familial predisposition. The survey was undertaken by means of a questionnaire administered by an interviewer, and the patients were matched with suitably chosen controls. In no case did a patient fill in his own questionnaire. In this study the only etiologic factors which have been demonstrated to bear a causal relationship to lung cancer are the smoking of cigarettes and the presence of chronic bronchitis. Suggested, but not established, is a possible role of urban life with its

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associated air pollution. It is possible that much of the effect of chronic bronchitis is attributable indirectly to cigarette smoking and to air pollution. There is in New South Wales a highly significant relationship between cigarette smoking and lung cancer. It was found that the greater the number of cigarettes smoked, the greater was the risk of lung cancer.

-- Am. Rev. Resp. Dis. Abstr.

142 Influence of Respiration on Venous Return in Pulmonary Emphysema. F.K. Nakhjavan, W.H. Palmer, and M. McGregor. Circulation 33, 8-16 (Jan. 1966).

The influence of respiration on the flow of blood from the abdominal vena cava into the thorax was studied in 15 patients with pulmonary emphysema and in ten control subjects without thoracic disease or heart failure. During quiet breathing in the control subjects, blood flowed into the thorax throughout the respiratory cycle at a rate which was greatest during inspiration. Simultaneously, the transmural pressure of the abdominal vena cava fell and transmural right atrial pressure increased. The same pattern of flow was observed in nine of the patients with emphysema. In the other six patients, however, flow was greatly reduced or completely arrested during inspiration, with simultaneous increase in transmural caval pressure and reduction in transmural atrial pressure. This inspiratory obstruction at the thoracic inlet was associated with gross hyperinflation of the lungs and low diaphragmatic position. It probably was not the result of the high negative and positive intrathoracic pressures that develop during inspiration and expiration, respectively, in such subjects. It is possible that this phenomenon may account for the peripheral edema that occurs in patients who have emphysema without associated hypertension or cardiomegaly.

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

143 The Effect of Posture on Respiratory Function in Patients With Obstructive Pulmonary Emphysema W.S. Erwin, D. Zolov, and H.A. Bickerman. Am. Rev. Resp. Dis. 94, 865-872 (Dec. 1966).

Respiratory function as measured by arterial blood gases and ventilometry is assessed in various positions ranging from the erect to the 20° Trendelenberg in ten patients with documented obstructive pulmonary emphysema. There were no significant differences in the values of blood gases, pH, or residual volume of patients tested in the various positions. In general, the vital capacity, functional residual capacity, and flow rates were lowered when the patients were placed at 20° Trendelenberg, or with a 15 pound weight over the lower abdomen in the supine position. A significant reduction, averaging 20%, in the minute ventilation breathing room air occurred with both the 20° and 10° head-down positions as compared with the erect positions. The finding was not associated with any alteration in the blood gases, suggesting a more efficient pulmonary ventilation. The 10° head-down position was more comfortable for the patient and, significantly, higher flow rates were recorded than for the 20° angle. There are 20 references.

-- Authors' summary

144 Experimental Production of Acute Pulmonary Emphysema in Newborn Piglets. Elinor M. Glauser. Am. Rev. Resp. Dis. 94, 873-881 (Dec. 1966).

The results of prolonged severe hyperventilation in newborn piglet littermates were studied. It was found necessary to combine both low oxygen and high carbon dioxide in the inspired gas to achieve this stressful hyperventilation to a degree of four to five times the level of the control animals. Exposure to 10% carbon dioxide and 7% oxygen for 24 hours resulted in marked hyperventilation. At autopsy the lungs were found to be over-inflated, weighed more, and showed some hemorrhage in contrast to the control littermates whose lungs were collapsed at death. Microscopic findings of distended alveoli with ruptured walls and thinning of the walls gave a picture microscopically resembling pulmonary emphysema in man. The hyperventilated piglets had a greater weight loss without a greater urinary excretion. Arterial blood analysis showed the hyperventilated piglets to have a lower pH, Po_2 and per cent saturation, and an elevated Pco_2. These findings are consistent with the picture of acute pulmonary emphysema. There are 29 references.

-- Author's summary

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SKIN DISEASES AND BURNS

145 Talc Granulomas of the Skin. M.J. Tye, K. Hashimoto, and F. Fox. J. Am. Med. Assn. 198, 1370-1372 (Dec. 26, 1966).

Surgical glove talc can cause granulomas in various intestinal and pelvic organs. In the skin, localized silica granulomas due to the glove talc have been observed in surgical scars and as the result of the impregnation of the skin by silicious particles, such as glass or sand, following an injury. Extensive talc granulomas of the skin have not been reported, to the authors' knowledge. In the present case hundreds of talc granulomas of the skin had developed in a 45-year-old women. It is postulated that the talcum powder gained entrance through the skin at the sites of draining or incised furuncles. Electron microscopic studies showed the electron-dense lamellae to be morphologically indentical to that of talc in many phagocytic cells. X-rays diffraction studies confirmed the foreign crystal to be talc. There are 11 references.

146 Lanolin Dermatitis. E. Cronin. Brit. J. Dermatol. 78, 167 (March, 1966).

Sheep fleece consists of several components among which wool wax and its principal derivative, lanolin, are the most important. The manufacture and uses of lanolin are described and the results of a study encompassing 40 lanolin-sensitive patients are reported. Of interest was the finding that varicose and facial eczema were the most common patterns seen in the patients and that the facial eczema due to lanolin sensitivity, presumably in cosmetic preparations, was found only in women. Different materials and techniques of patch testing are compared in an effort to find a reliable method for diagnosing lanolin sensitivity. -- J. Occ. Med. Absts.

147 Office Management of Acne Vulgaris. E.H. Tuttle. N.Y. State J. Med. 66, 259-265 (Jan. 15, 1966).

Acne vulgaris accounts for approximately one of every five patient visits in the private office practice of dermatology. The following categories of treatment are discussed: hormonal, antibiotic, corticosteroid, topical, dietary, x-radiation, ultraviolet light, local surgical, and psychotherapy. The cleansing agents and lotions used as topical therapy possess merit only if they incorporate one or more of the following medications: sulfur, salicylic acid, or resorcinol. Ultraviolet light therapy was thought to be beneficial. The systemic administration of broad spectrum antibiotics has markedly improved the management of these patients. It is felt that androgenic hormones are the primary cause of acne and the use of estrogens is well justified in certain patients. Attention is called to the social and psychological problems of the acne patient. Since the problem requires long-term therapy, consideration should be given to the cost of medication prescribed. -- J. Occ. Med. Absts.

148 Studies in Burns: II. The Role of Hydrational Status on Water Loss From the Body Surface. C. Jelenko and R.W. Buxton. Am. Surg. 32, 781-793 (Nov. 1966).

Measurements of water loss were made upon the surface of intact skin, burn eschars, and open wounds on humans and on rabbits in vivo under varying conditions of body hydration utilizing a modified gas chromatographic technique. The prior state of hydration did not seem to significantly affect the pattern or gross amount of surface water loss occurring upon parenteral administration of saline at similar times post-burn. The burn eschar of a man or animal dehydrated prior to being burned, required a much longer time to attain maximum water retentivity than the eschar of those normally hydrated. The immediate post-burn water loss of a man or a rabbit, dehydrated prior to being burned, is significantly less than that lost by the eschar of the normally hydrated subject. Nonetheless, the total water lost by the eschar as it becomes maximally water retentive is as great, and perhaps greater, if the subject was dehydrated prior to burning. A marked increase in water loss occurred from the eschar of a man or an animal redehydrated, when the original burns occurred during a time of partial body dehydration. Hydrational state did not seem to significantly alter the pattern or total amount of water lost from intact skin or open wounds. -- J. Am. Med. Assn. References & Reviews

149 Macroscopic Appearance of Malignant Melanoma of the Skin. N.C. Davis, J. Herron, and G.R. McLeod. Med. J. Australia 2, 883-886 (Nov. 5, 1966).

A malignant melanoma of the skin may develop from a pre-existing nevus or de novo. A history of recent change is of paramount importance of the diagnosis. The patient's attention may be attracted to the mole by itching, weeping, or bleeding on minor trauma. He may notice that the lesion has increased in size: an irregular extension at the periphery is particularly significant. The lesion may become raised and palpable, whereas it was previously flat. A change in color

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may occur, and this is usually from brown to black. This is often seen as an uneven black speckling within the mole, or as a dark staining at the periphery. Less commonly, pale non-pigmented areas or fleshly tumors are seen. The doctor should suspect the lesion on the history before he even examines the patient. If suspicions of malignant melanoma are supported by the appearance of the lesion, wide surgical excision should be recommended as an initial procedure.
-- J. Am. Med. Assn. References & Reviews

NWBB-0021076

150 Detection of Chromate Sensitivity: Intradermal Versus Patch Testing. S. Epstein. Ann. Allergy 24, 68 (Feb. 1966).

Three cases are described which demonstrated clinical contact allergy to chromium with negative patch tests. However, each individual developed positive reactions to intradermal testing with weak dilutions of potassium dichromate. In addition to discussing the indications for intradermal testing versus patch testing, the reliability and risks involved with intradermal tests are described.
-- J. Occ. Med. Absts.

CHEMICAL HAZARDS

151 Carcinogens in a Cracked Petroleum Residuum. The Contributions of Various Polycyclic Aromatic Hydrocarbons to the Carcinogenic Potency of a Catalytically Cracked Oil. R. Tye, et al. Arch. Environmental Health 13, 202-207 (Aug. 1966).

Fractionation by several techniques and bioassay have been applied to a petroleum residuum that had come from a process that had involved catalytic cracking. The major carcinogens in this oil were categorized according to whether they were found in the relatively high boiling portion (438-455 C) characterized by the presence of 5-ringed or alkyl 4-ringed polycyclic aromatic hydrocarbons (PAH), in intermediate fractions (404-438 C) characterized by unsubstituted and methyl substituted 4-ringed PAH, and in lower boiling fractions characterized by assorted smaller compounds including alkyl 3-ringed PAH. In the same order the percentages by weight (of the whole oil) of characteristic carcinogens found in each category were as follows: benzo(a)pyrene, 0.4%; benz(a) anthracene and alkyl homologs 0.4%; and benzo(c)phenanthrenes, 0.01%. Larger quantities of benzo(c) phenanthrenes may have been present in the intermediate fractions, which were not analyzed for these compounds. In spite of the small percentage that was found, the presence of this class of carcinogens may be significant because they were the dominant carcinogens in the most volatile portion of the oil. There are six references. -- Authors' summary

152 The Estimation of a Euglobulin by Ion-Exchange Chromatography. C.H. Powell, et al. Arch. Environmental Health 13, 199-201 (Aug. 1966).

A chromatographic appraisal of a euglobulin was developed utilizing a column of finely divided amberlite IRC-50. A concentrate of the human euglobulin was chromatographed at -1C ± 2C, pH 5.38 with a flow rate of 8 ml/hr. The eluted fractions were subjected to a bioassay for euglobulin and absorbance was measured at 278 mμ. A peak of concentration of protein corresponded closely with the peak of biological activity. Sera from experimental animals were tested by both techniques and a linear relationship was found between the level by bioassay and the quantity of protein as indicated by the absorbances of a chromatographic peak. There are 13 references. -- Authors' summary

153 Eye Irritation Response at Low Concentrations of Irritants. E.A. Schuck, et al. Arch. Environmental Health 13, 570-575 (Nov. 1966).

The linear relationship between reported eye irritation and formaldehyde concentration in simulated atmosphere experiments does not hold when the formaldehyde concentration is below 0.3 parts per million (ppm). Subjects may experience equal irritation at irritant concentrations differing by an order of magnitude. Thus most subjects experienced the same irritation intensity at 0.05 ppm of formaldehyde as they did at 0.5 ppm. At irritant concentrations less than 0.3 ppm, the rate of blinking determines to an important extent the intensity of eye irritation which the subject detects. The eyes of human subjects can readily detect and react to as little as 0.01 ppm formaldehyde. From these simulated atmosphere experiments, one can predict that the concentrations of formaldehyde and peroxyacetyl nitrate found in atmospheres polluted with photochemical air pollution can account for most of the detected eye irritation. It should be noted that the experimental design used in these experiments does not preclude the postulated presence of an unknown short-lived irritant formed in the early stages of the photochemical reactions. However, these results indicate that such postulated irritants are not required in order to account for the observed irritation. There are nine references. -- Authors' summary

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154 Calcium Disodium Edetate Nephrosis in Inbred Rats. Variation in Marshall, Buffalo, Fischer, and ACI Strains. M. D. Reuber and C. W. Lee.
Arch. Environmental Health 13, 554-557 (Nov. 1966).

Calcium disodium edetate (calcium disodium ethylenediamine tetraacetate; Calcium Disodium Versenate) has resulted in nephrosis in human beings treated for lead poisoning. Toxicity studied in rats includes hydropic swelling and necrosis of the proximal convoluted tubules. The age, strain, and sex of the rats have varied. Many investigators did not give such information; others referred to their animals as albino rats; some gave weights. Random bred Sprague-Dawley male rats have generally been used. In this investigation the incidence and severity of renal lesions varied in inbred male rats of four unrelated strains (Marshall, ACI, Fischer, and Buffalo) given daily intraperitoneal injections of calcium disodium edetate. There was least involvement in Marshall rats and greatest in ACI rats. Marshall rats had minimal and Buffalo rats had moderate hydropic swelling of the proximal convoluted tubules. Advanced lesions with disruption of tubular cells were present in Fischer and ACI rats. In ACI rats, there was also regeneration of epithelial cells. The severity of lesions in the different strains may be related to genetic differences, the most important being differences in hormones. There are 13 references.

155 Poisoning of Industrial Origin in a Community. H. Oyanguren and E. Perez.
Arch. Environmental Health 13, 185-189 (Aug. 1966).

The occupational health worker should always bear in mind that toxic hazards originating in industry may also affect groups in the population near factories and in certain avenues of commerce. Likewise, the general practitioner or the pediatrician, in the presence of poisoning, should look for the source in the environment; the sources of arsenic poisoning of occupational origin may extend to neighboring populations without appearing as poisoning, per se, but simply as a degree of absorption of a toxic material, which may give rise to serious effects, at long range, under appropriate conditions. Lead poisoning of industrial origin in the community may arise out of unusual conditions. It has been found especially among children, who live near smelters, or come in contact with lead-containing wastes of old industrial plants, or in homes in which lead-containing materials are handled or processed. The physician who encounters illness suggestive of lead poisoning in children should first substantiate or exclude lead as the toxic agent by appropriate trustworthy analytical means, and, if lead is convicted, should seek out the source in the environment of the child, so as to prevent recurrence of the illness in his patient, or further cases of poisoning from the same source. There are four references. -- Authors' summary

156 Reproducibility of Single Oral Dose Toxicity Testing. C.S. Weil, et al.
Am. Ind. Hyg. Assn. J. 27, 483-487 (Nov.-Dec. 1966).

The single peroral dose toxicity of 26 chemicals was estimated each year for 12 years to determine the reproducibility of the test and of commercial production. For 11 years the resultant median lethal doses were relatively unaffected by the different samples of each chemical received annually, by changes in the stock of rats, by the diluted or undiluted state of the materials, or by the change of personnel performing the tests. Only one variable, the weight of the rat, appeared to have a significant effect on the LD50. -- Authors' abst.

157 Spectrographic Determination of Microgram Quantities of Tellurium in Biologic Materials.
R.E. Kinser and R.G. Keenan. Am. Ind. Hyg. Assn. J. 27, 501-505 (Nov.-Dec. 1966).

A spectrographic method for the determination of microgram amounts of tellurium in biological materials is described. The residues of wet-ashed samples are converted to the chloride form for excitation. Waterproofed electrodes containing the internal standard (thallium), the sample, and 5 mg. of spectroscopic buffer are capped with boiler caps. Each electrode is excited as anode in a 10-ampere 220-volt direct-current arc. The intensity ratio of the tellurium 2385.8-A line to the thallium 2379.7-A line (the internal standard line) is calculated. Replicate determinations of tellurium in standard samples prepared from a liver ash matrix gave a detection limit of 0.1 microgram of tellurium per 2 mg. of tissue ash. Repeated analysis of liver ash standards yielded an overall relative standard deviation of 10.6%. The method is particularly valuable for the analysis of small body organs containing submicrogram quantities of tellurium. There are 12 references. -- Authors' abst.

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158 Sodium in Drinking Water, Pitfall in Maintenance of Low Sodium Diet. G. E. Garrison and O. L. Ader. Arch. Environmental Health 13, 551-553 (Nov. 1966).

It is well established and widely accepted that restriction of dietary sodium is an important component of therapy in chronic congestive heart failure, hypertension, certain types of renal disease, advanced cirrhosis of the liver, and during a large percentage of pregnancies. The sodium content of most foods has been determined, and this information is widely utilized in sodium restricted diets. On the other hand, less attention has been given to the concentration of sodium in water that is ingested. Available information indicates that water supplies contain marked variations in sodium concentration; some supplies have sodium concentrations that make even mild sodium restricted diets impossible to follow if the usual water is used. It is, therefore, extremely important to know the concentration of sodium in the water that is consumed by a patient on a sodium-restricted diet. Data are presented on the sodium concentration in water from the muncipal supply and from selected wells in a county (Durham) in North Carolina; in addition, information is provided on the increase in the sodium concentration produced by home water softeners. There are four references. -- Authors' introduction

159 Limits of Detection of Beryllium in Tissues by Microemission Spectrography. S. F. Brokeshoulder et al. Am. Ind. Hyg. Assn. J. 27, 496-500 (Nov.-Dec. 1966).

The metal beryllium has been successfully and unequivocally demonstrated by microemission spectrography on a semiquantitative basis in tissue sections 50 microns thick. The beryllium was localized in individual pulmonary granulomas in dogs exposed to beryllium. The determination of the lower limit of detection could indicate the threshold level of beryllium in tissue that can induce injury. Beryllium acetylacetonate dissolved in technical-grade xylene was used to prepare a series of working standards. Initial results indicate that as little as 1.48×10^{-12} gm. of beryllium is a sample of paraffin weighing about 2.91×10^{-8} gm. has been detected. Similar or greater quantities of beryllium have been demonstrated in similar-size samples of embedded lung tissue from dogs exposed to beryllium. -- Authors' abst.

160 Hypertension in Rats from Injection of Cadmium. H. A. Schroeder, et al. Arch. Environmental Health 13, 788-789 (Dec. 1966).

Cadmium acetate was injected into rats at dosages of 2 mg/kg. Arterial hypertension resulted, at incidences similar to or exceeding those resulting from partial constriction of one renal artery. Six references are given. -- Authors' summary

161 Determination of Cobalt in Air and Biological Material. D. M. Hubbard, F. M. Creech, and J. Cholak. Arch. Environmental Health 13, 190-194 (Aug. 1966).

A procedure combining various ideas obtained from the literature was developed for the determination of cobalt in a variety of biologic materials, such as urine, blood, and tissue. The method involves the removal of iron by treating the solutions of the ashed sample with cupferron, followed by complexing the cobalt with sodium diethyldithiocarbamate and extracting the metal complex into chloroform. Cobalt in the chloroform extract is then determined colorimetrically by forming the cobalt-Nitroso-R-Salt complex. It was found that the levels of concentration of cobalt in the urine and blood were extremely low, varying from 1 microgram to 7 micrograms liter of urine, and less than 0.25 microgram/100 gm of blood. There are ten references.-- Authors' summary

162 Acute Iron Intoxication. A Case Treated by Chelation. G. Whelan, V. Fazio, and J. C. Biggs. Am. J. Med. 41, 626-628 (Oct. 1966).

Iron salts, usually regarded as harmless and of proved therapeutic value in iron deficiency, can lead to death when taken in excessive quantities by young children. Fatal iron poisoning accounts for a significant proportion of the deaths in this age group from accidental ingestion of potentially lethal substances. Aldrich reviewed the literature in 1958 and found that the overall mortality was 50% in reported cases of iron intoxication. Ferrous sulfate was usually implicated and the fatal doses ranged from 3 to 18 gm. Survival has been reported after ingestion of 15 gm. of ferrous sulfate. This paper gives a description of a two-year-old girl who ingested an ordinarily fatal dose of ferrous sulfate (20 gm). The early oral and parenteral administration of an iron-chelating agent (desferrioxamine) undoubtedly had a favorable influence on the ultimate outcome, which was early and complete recovery.

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163 Lead, Chromium, and Molybdenum by Atomic Absorption. J.O. Pierce and J. Cholak. Arch. Environmental Health 13, 208-212 (Aug. 1966).

Atomic absorption spectrophotometry for the routine analysis of trace metals, especially lead, in biological systems of urine and blood is now possible. For the determination of lead, 25 ml of urine and 5 ml of blood are required. The analysis is rapid, free of interferences, and involves few manipulations. Most of the methods reported in the literature involve the extraction of lead as a chelate into an organic solvent. This procedure is quick and reliable, but fresh urine is usually required and whole blood must be used. For samples from which the lead cannot be extracted, ashing may be used satisfactorily. For samples of comparable and suitable size, the sensitivity of detection and the accuracy of analysis are equal to those obtained by present chemical and spectrographic methods. For handling traces of lead in samples of less than 1 gm or less than 1 ml in volume, only the spectrographic method is suitable. Analyses for chromium may be achieved by ashing the samples, whereas, in the case of molybdenum, the procedure lacks sensitivity and interferences add to the difficulties of analysis. The atomic absorption spectrophotometer has considerable potential as an analytical tool for the industrial hygienist. The speed of analysis and the possibility of the elimination of complex manipulations for most applications make the procedure very attractive for handling biological specimens as well as dusts and fumes collected from the atmosphere in the impinger, electrostatic precipitator, or on filter media. In the analysis of biological materials for trace metals by atomic absorption, consideration must be given to the absolute quantity of the specific metal present, as well as to the size of sample available. This technique may be used to supplement existing methods, but does not,in itself, solve all of the problems associated with microchemical analyses. There are 14 references.
-- Authors' summary

164 Chronic Toxicity of Gadolinium Oxide for Mice Following Exposure by Inhalation. R.A. Ball and G. VanGelder. Arch. Environmental Health 13, 601-608 (Nov. 1966).

The increased industrial use of rare earth metals has led to a realization that much remains to be learned about their toxicity, especially the chronic effects. Their use, therefore, may be attended by a real or potential health hazard to personnel using them. In the present investigation mice exposed to gadolinium oxide aerosol for 20 to 120 days were studied for evidence of chronic toxicity. Two to five weeks after exposure started, there was a marked increase in deaths due to pneumonia in mice inhaling the dust. There was also a trend toward shorter life spans in the mice which survived the exposure. Analyses of weight gains and hematologic values failed to show significant differences in exposed mice compared to controls. Although some rare earth dust was removed from the alveoli to the regional nodes, the large amounts left in the lungs several months postexposure suggest that the mouse has an inadequate clearing mechanism for removing this compound. The histological features support the conclusion that even at heavy exposure levels, gadolinium oxide ranks as a low-grade pulmonary irritant for mice, inciting focal areas of interstitial thickening around macrophages which contain rare earth dust, and with very little tendency towards pulmonary fibrosis. An unusual histological finding was pulmonary calcification in the region of the alveolar basement membranes and elastic laminae of small pulmonary vessels of exposed mice. The approximately equal incidence of primary lung tumors, mostly bronchial adenomas, in both exposed and control groups, indicates that gadolinium oxide is not a lung tumor accelerator for this strain of mice. There are 31 references.

165 Acute Tetramethyl Lead and Trimethyl Lead Chloride Intoxication in the Rat. Histopathological and Serological Data. M. Gherardi and A. Gnudi. Med. lavoro 57, 53-59 (Jan. 1966).

Rats were intoxicated with tetramethyl lead administered by inhalation, or with trimethyl lead chloride given intraperitoneally. As observed by previous authors, the rats were very little affected by the action of tetramethyl lead, even if inhaled, while they became severely intoxicated when treated with trimethyl lead chloride. The symptoms produced by the two substances were identical, the only difference lying in the different degree of toxicity. This fact stresses the determining role played by the trimethyl lead ion in the pathogenesis of the intoxication. The main serum indexes studied during the stage of intoxication did not differ significantly from the normal values, and the histological examination of the most important organs did not demonstrate any significant specific changes. -- APCA Absts.

166 Mercury Exposure in a Jewelry Molding Process. A.T. Jones and E.O. Longley. Arch. Environmental Health 13, 769-775 (Dec. 1966).

A jewelry molding process involving the use of a low-melting-point, mercury-cadmium alloy has been investigated in seven small factories. At each, considerable exposure to mercury vapor occurred, ranging overall from 0.17 to 35.0 mg of mercury per cubic meter of air prior to,

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and 0.001 to 0.18 mg per cubic meter following, installation of control measures. Of 36 employee one showed definite symptoms of mercurialism, while others exhibited vague changes. There appeared to be no correlation between mercury exposure and urinary levels of mercury. The cadmium portion of the alloy did not appear to constitute an exposure problem. There are six references given. -- Authors' summary

NWDB-0020078

167 A Note on Methyl Bromide. G.R. Simpson. Arch. Environmental Health 13, 673-674 (Nov. 1966).

Methyl bromide is one of the three declared noxious substances under the New South Wales Fumigation Regulations. Because it is colorless, practically odorless and tasteless it is not apparent to the operator when a toxic atmosphere is encountered. As a result, severe cases of methyl bromide poisoning from house fumigation and from fire extinguishers and some milder ones in agriculture have occurred. During the last few years the use of methyl bromide has gained popularity in New South Wales, particularly as a total herbage destroying agent for golf and bowling greens. The method of application to such greens, the concentrations found, and the necessary precautionary measures are described in this paper. The author concludes that tests for methyl bromide in air during fumigations for total herbage destruction on golf or bowling greens indicated a severe potential hazard for the operator. It is essential respiratory protection be afforded at all times and dermal protection as well while gassing.

168 Hydrocarbon Pneumonitis in Rats. R. Ring and J.D. Nelson. Arch. Environmental Health 13, 749-752 (Dec. 1966).

Hydrocarbon pneumonitis in rats due to kerosene and mineral seal oil furniture polish (Old English) was compared by inducing aspiration in a standardized fashion. The death rate within 24 hours from pulmonary congestion and edema was the same in both groups (60%). The extent of pneumonitis and the histopathologic changes in those that survived four days were indistinguishable in the two groups. The clinical observation that pneumonitis in children due to mineral seal oil furniture polish is more severe than that due to kerosene cannot be supported by these studies as being related to difference in aspiration hazard or toxicity. It has been suggested that the clinical observation may be related to the volume consumed, the furniture polish being more appealing to the child than kerosene. In the second set of experiments an attempt was made to evaluate the hazard of gastric lavage following intragastric instillation of kerosene in rats. Gastric lavage neither increased nor decreased the incidence and extent of pneumonitis in rats. These findings are in agreement with results of the cooperative clinical study of hydrocarbon poisoning in children. There are six references. -- Authors' summary

169 Permanent Encephalopathy From Toluene Inhalation. J.W. Knox and J.R. Nelson. New Engl. J. Med. 275, 1494-1496 (Dec. 29, 1966).

Inhalation of glue vapors in an attempt to induce euphoria has recently become quite popular, particularly among teen-agers. The desired effects are probably produced by toluene, the major component of the vapors. The acute central-nervous-system symptoms after toluene inhalation are transient euphoria, exhilaration and excitement, but in high doses confusion, headache, nausea, tinnitus, ataxia, tremors and fasciculations often occur. Acute, reversible hepatic decompensation and bone-marrow suppression are also prominent effects of exposure to high concentrations of toluene. The severity of the acute symptoms correlates well with the concentration of toluene vapor, and specific safeguards have been established for industrial workers who must be exposed to this highly used solvent. Although acute toluene encephalopathy in human beings is well documented, irreversible brain damage after chronic exposure to toluene vapors has not been conclusively proved. In 1961 Grabski (Am. J. Psychiat. 118, 46 (1961)) briefly reported the first case in which long-term toluene inhalation had apparently led to cerebellar degeneration. The present paper describes the same patient in more detail after eight additional years of exposure to toluene and documents permanent central-nervous-system damage from nearly daily inhalations of large quantities of toluene over a 14-year period. The clinical findings of ataxia, tremulousness, emotional lability, a marked snout reflex and a Babinski sign on the right side were accompanied by diffuse electroencephalography. A plea is made for greater investigation of the extent of chronic toluene habituation in adults. There are eight references.

170 A Summary of Work on Aldrin and Dieldrin Toxicity at the Kettering Laboratory. F.P. Cleveland. Arch. Environmental Health 13, 195-198 (Aug. 1966).

The level of agricultural productivity in the United States depends upon the use of effective broad spectrum insecticides. Two of the most efficacious insecticides are aldrin and dieldrin. While these substances are highly toxic to insects and experimental animals, no definitive evidence is available that any harm has resulted to mankind. The incidence of tumors in male and female

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rats fed on diets containing aldrin and dieldrin for a period of two years was of the same order of magnitude as that observed in control animals. Thus, on this basis, aldrin and dieldrin are neither tumorigenic nor carcinogenic substances. Although it is essential to protect the health of the general public, it is equally essential that any decision to restrict the use of aldrin and dieldrin by enforcement agencies must be based on sound and factual data, first establishing that a hazard in reality exists. There are 15 references. -- Author s summary

171 Organochlorine Insecticides: Concentrations in Human Blood and Adipose Tissue. J. Robinson and C.G. Hunter. Arch. Environmental Health 13, 558-563 (Nov. 1966).

The mean (geometric) concentrations of HEOD (1, 2, 3, 4, 10, 10-hexachloro-6, 7-epoxy-1, 4, 4a, 5, 6, 7, 8, 8a-octahydro-1, 4, 5, 8-endo, exo-dimethanonaphthalene), the major constituent of technical dieldrin, in the whole blood and depot fat of 44 persons with no known occupational exposure were 0.0014 ppm and 0.22 ppm respectively; the corresponding concentrations of total DDT-type compounds were 0.013 and 4.0 ppm respectively. The ratio of the concentrations in the blood and depot fat were 159 and 306 for HEOD and total DDT-type compounds respectively. In these people no significant relationships were found for either type of compound between the concentrations in the whole blood and depot fat; this is considered to result from the errors present in the observations as a significant correlation is found if the results for males with elevated body burdens of HEOD (arising from occupational or deliberate exposure) are taken into account. No significant change in the HEOD concentration of the bloods of the general human population of England has occurred over the period 1962-1965, and it is concluded that a state of equilibrium had been established between the intake and elimination of this compound. There are 11 references. -- Authors' summary modified

172 Methoxychlor Toxicity. Comparative Studies in the Dog and the Swine. A.S. Tegeris, et al. Arch. Environmental Health 13, 776-787 (Dec. 1966).

Methoxychlor (DMDT) mixed in the feed at 1, 2, and 4 gm/kg body weight per day, was given to three groups of dogs and three groups of swine seven days a week for six months. Most of the dogs in the medium and high dose groups started convulsing within six weeks after initiation of the experiment, and most of them died within three weeks thereafter. All dogs on pesticides lost weight during the experiment. There were no hematological abnormalities noted. Biochemically, alkaline phosphatase and both serum transaminases were significantly elevated in the DMDT dogs in a dose-dependent relationship. At autopsy the mucosa of the small intestine was congested. The swine receiving methoxychlor lost weight during the first month of the experiment, but afterwards the low and mid-dose groups regained their original weight while the high dose group never did. There was a striking degree of mammary gland hypertrophy in the sows of the experimental groups, observed as early as seven weeks after initiation of the experiment. There were no hematological abnormalities. Biochemically the blood urea nitrogen was elevated. At autopsy there were striking changes in the kidneys of all methoxychlor-treated swine compatible with chronic nephritis. The uteri of all the sows from the high dose group and of some sows from the other two pesticide groups were grossly hypertrophic. Microscopically, the uteri from all the pesticide-treated sows showed a thick hyalinized layer separating the endometrium from the myometrium; the mammary gland of the sows from all the DMDT animals were both hypertrophic and hyperplastic in a dose-dependent relationship. In a subsequent experiment it was found out that no toxicity signs developed when methoxychlor suspended in 1% gum tragacanth was administered to dogs by gastric tube for as long as six months. There are 25 references. -- Authors' summary

173 Degradation of Insecticides by the Human and the Rat Liver. Metabolic Fate of Carbaryl, Malathion, and Parathion. F. Matsumura and C.T. Ward. Arch. Environmental Health 13, 257-261 (Aug. 1966).

The results of a survey on the human and rat liver capacity to degrade three different insecticides indicated (1) the general degradation patterns of the livers from these two different species are very similar, (2) aging at room temperature and freeze-storing had some denaturation (or deactivation) effects upon malathion phosphatases and, to a less extent, upon carbaryl oxidative degradation enzymes, (3) malathion carboxyesterases and parathion phosphatases seem to be very stable enzymes against the above treatments, and (4) no detectable evidence to suggest a relationship between the enzyme activities toward these substrate insecticides and the age, sex, the cause of death, postmortem period (aging), and freeze-storing period of each liver sample: except for one case with carbaryl, where the liver samples from male patients showed a higher rate of water-soluble metabolites production as compared with those from female patients. There are 17 references. -- Authors' summary

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174 Rapid Determination of Blood Cholinestrase Activity. J.H. Holmes and Lucy Jankowsky. Arch. Environmental Health 13, 564-569 (Nov. 1966).

Two rapid methods for measurement of plasma cholinesterase activity, the Acholest test paper and the bromothymol blue test kit, were investigated in relation to their effectiveness in diagnosis of organophosphorus insecticide exposure. Both methods provided reasonable correlation with measurements of the plasma cholinesterase activity by the Michel method, and proved of diagnostic value for 117 patients with suspected exposure to the organophosphorus insecticides. The Acholest test gave more consistent results (with two exceptions) and a better quantitative correlation with the Michel measurements. The tests did not correlate well with changes in RBC cholinesterase activity (Michel method) and thus would have limitations in atypical toxicity problems. While the tests described are diagnostically effective, there is still a need for development of a more definitive test for use in small hospitals in regions where extensive spraying operations are in progress. There are 13 references. -- Authors' summary

175 Subacute Oral Toxicity of a Biodegradable Linear Alkylbenzene Sulfonate. J.H. Kay, F.E. Kohn, and J.C. Calandra. Toxicol. & Appl. Pharmacol. 7, 812 (Nov. 1965).

A linear, biodegradable sodium dodecylbenzene sulfonate was fed to rats at dietary levels of 0.02%, 0.1%, and 0.5% for 90 days. No adverse effects were found on the following parameters: growth, food consumption, food utilization, survival, hematologic values, urinary analytical values, organ weights, and organ/body weight ratios. There were no gross or microscopic tissue changes attributable to ingestion of the test material. The study was conducted to determine any toxicologic differences between this type of molecule and the non-linear (ABS) type.
-- J. Occ. Med. Absts.

176 Discussion of the Interpretation of Threshold Limit Values. J. Novak and V. Vasak. Am.Ind. Hyg. Assn. J. 27, 555-558 (Nov.-Dec. 1966).

In the calculation of threshold limit values for mixtures, the assumption of ideal behavior of liquid mixtures can lead to results considerably apart from actual conditions. Better results can be obtained by taking into account the activities of the components of such mixtures. The necessary equations and several examples are presented. There are 12 references.
-- Authors' abst.

INDUSTRIAL DUSTS

177 Graphite Pneumoconiosis of Electrotypers. E.A. Gaensler, et al. Am. J. Med. 41, 864-882 (Dec. 1966).

Lung disease resulting from work with natural graphite has received scant attention despite the fact that this crystalline form of carbon is used in a wide variety of industrial processes. The few reports that appeared prior to 1950 are not easily interpreted because they dealt with roentgenographic findings only or because they concerned workers who had also been exposed to large amounts of rock dust, sand or clay. Among the eleven recorded cases with tissue studies, it appears that only three patients were exposed to natural graphite alone. Graphite lung disease has not been described in this country. The present paper is a report of four patients who were electrotype molders for 18 to 40 years. Their chief complaint was dyspnea and two died of cardiopulmonary insufficiency. Chest roentgenograms, available in three, showed, respectively, fine reticulation, coarse nodulation and progressive massive fibrosis with cavitation. Lung function studies in three patients revealed severe respiratory impairment. In two the changes were those associated with the "alveolar-capillary block" syndrome with severely reduced diffusing capacity and markedly increased A-a oxygen gradients, venous admixture and physiologic deadspace, while in the third the picture was largely one of obstructive emphysema. A lung biopsy in one patient showed massive infiltration with black dust and a coarse interstitial fibrosis. Postmortem examination in three revealed heavy black lungs filled with graphite, interstitial fibrosis, perifocal emphysema, massive fibrosis with "graphite cyst," severe vascular sclerosis and cor pulmonale. This picture was indistinguishable from that seen in coal workers with progressive massive fibrosis. Analysis of electrotypers graphite and lung tissue revealed no detectable silica in two instances and 5% alpha cristobalite in one case. Heat and acid-treated slides showed a close relationship between silica and pathologic changes in one case and not in the other. Tuberculosis was ruled out as a cause of progressive massive fibrosis. Silica was thought to have played a small role, if any, because the pathologic picture did not resemble silicosis, because of the absence of significant amounts of silica in the lung tissue in two of three cases, and because pneumoconiosis with progressive massive fibrosis, as seen here, can be produced by silica-free

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soot or carbon black. Progressive massive fibrosis was most likely the result of the physical presence of large amounts of carbon interfering with the normal pulmonary drainage mechanism aggravated by repeated episodes of infection. There are 36 references.
NOTE: The following appears in the authors' acknowledgment: "We also gratefully acknowledge the assistance of Dr. Paul Gross, Director of the Research Laboratory, Industrial Hygiene Foundation of America, Inc., at the Mellon Institute who interpreted some of the microscopic sections and who prepared for us the special slides illustrated in Figure 11."

178 The Deposition of Unipolar Charged Particles in the Lungs of Animals. D.A. Fraser. Arch. Environmental Health 13, 152-157 (Aug. 1966).

This investigation has shown that the degree of retention of particles in the respiratory tracts of animals could be doubled by placing a charge of 1,000 electrons per particle on these aerosols. A qualitative analysis of the mechanisms which account for the deposition of airborne particles in the respiratory tract indicates that, in each case, the effect of placing a unipolar electrical charge on the particles would be to increase the rate of deposition of the particles. A quantitative analysis, to predict the magnitude of this effect, is impractical because of the complexity of the respiratory tract and the fact that such physical properties of the particles as density, size, shape, and dielectric constant, will differ with every dust and so influence the results. The qualitative prediction, however, is in agreement with the experimental observations. The increase in retention in the entire respiratory tract does not appear to be related to the size of the particles inhaled, within the limits of size investigated. This would suggest that the image force of attraction which is induced between the charged particle and the vessel wall is the most significant factor contributing to the increased rate of deposition for charged particles. It was originally thought that the existence of electrical charges on either naturally occurring aerosols or those produced in industry might have a significant effect on the retention of these particles in the lungs. Under normal circumstances, however, these particles would not acquire charges of more than ten or perhaps 20 electrons per particle. It has been demonstrated that the increase in the deposition of particles bearing charges of this magnitude could not amount to more than 1% or 2%. Such an increase would not ordinarily have any significance. There are 20 references.
-- Cond. from author's conclusions

179 Identification of Vehicle Tire Rubber in Roadway Dust. R.N. Thompson, C.A. Nau, and C.H. Lawrence. Am. Ind. Hyg. Assn. J. 27, 488-495 (Nov.-Dec. 1966).

A technique combining pyrolysis and chromatography for the detection of vehicle tire abrasion products in roadway dust is described. Samples of elastomers used in tire formulations were volatilized and separated by gas-liquid chromatography to provide characteristic chromatograms. These identifying patterns appeared consistently in the chromatographic separations of the pyrolyzates of compounded tire rubber and various roadway dusts. To confirm the technique two chromatographic procedures were used for the identification of specific components of the thermal degradation products of raw elastomers, compounded rubbers, and roadway dusts. There are eight references.
-- Authors' abst.

180 Thesaurosis. Pulmonary Function Studies in Beauticians. O.P. Sharma and M.H. Williams, Jr. Arch. Environmental Health 13, 616-618 (Nov. 1966).

Pulmonary function studies were done in 62 beauticians and 33 controls. Although a wide range of values for lung volumes and diffusing capacity was encountered, there was no significant difference between the two groups. Part of this variation was due to smoking habits among the beauticians, and cigarette smoking was associated with significant reduction of diffusing capacity and duration of work as a beautician, and the authors conclude that there is little evidence for the concept that exposure to hairspray is associated with significant impairment of pulmonary function or disease. There are 16 references.
-- Authors' summary

181 Fiberglass Conjunctivitis and Keratitis. E.O. Longley and R.C. Jones. Arch. Environmental Health 13, 790-793 (Dec. 1966).

Fiberglass dust is suggested as a probable cause of conjunctivitis and keratitis. There appears to have been a clear relationship between exposure to fiberglass and development of symptoms on a number of occasions. Four other employees who did the same work as the patient reported here all wore glasses, and none was affected by irritation of the eyes although all had experienced fiberglass skin irritation. In the light of this experience, it appears reasonable to suggest that protective goggles should be worn if employees handling fiberglass develop sorness of the eyes, as keratitis is always a serious condition often resulting in corneal scarring. The authors would be interested to hear of other cases of keratitis in which fiberglass might be implicated.
-- Authors' comment

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182 Rheumatoid Factor in Serum of Individuals Exposed to Asbestos. B. Pernis, et al. Ann. N.Y. Acad. Sci. 132, 112-120 (Dec. 31, 1965).

The presence and titer of rheumatoid factors in the sera of 315 asbestos insulation workers and of 103 controls were determined by conditioned hemagglutination with tanned red cells coated with aggregated human or rabbit gamma globulins. The asbestos workers were exposed to the dust for periods from 1 to 54 years, and most of them showed x-ray evidence of asbestosis that was graded into grades from one to three. A definite increase in frequency and titers of rheumatoid factors in the controls of same age and sex, was found in workers with asbestosis of grades in two and three. Similar serological abnormalities are found in cases of pulmonary fibrosis of different origin, idiopathic, silicosis, coal workers' pneumoconiosis, and sarcoidosis.

-- APCA Absts.

183 Occupational Hazards of Pipe Insulators. W.T. Keane and M.R. Zavon. Arch. Environmental Health 13, 171-184 (Aug. 1966).

In this survey the attempt has been made to investigate all of the substances with which insulators come in contact in the normal pursuit of their trade. In the present state of technology, and in light of existing medical and toxicological data, the majority of the substances examined proved incapable of presenting a serious health hazard to insulators. The only insulating substance which justifies concern is asbestos. This report and other available scientific data at the present time are insufficient to provide an adequately based conclusion. The most convincing data are those of Selikoff. The further results of his and other investigations will be awaited and should contribute toward sound judgment of this matter. There are 155 references. -- Authors' summary

184 Malignancies in Asbestos Workers. J. Lieben. Arch. Environmental Health 13, 619-621 (Nov. 1966).

A study of 68 hospital admissions with asbestosis from an asbestos textile and friction materials plant included 21 malignancies— 13 of these were carcinoma of the lung and eight carcinomas of other organs. Eighteen of the patients had exposures to asbestos in their occupational environment for a period of 10 to 36 years. Only three patients had their first exposure after 1940. Extensive dust control measures have been instituted by the plant. There are six references.

-- Author's summary

185 Exposure to Asbestos and Malignancy. Anonymous. London Clin. Med. J. 7, 10-11 (Jan. 1966).

Recent surveys have shown asbestos bodies to be present in many of the otherwise normal lungs of those living in clean, non-industrial communities, suggesting that environmental contamination with asbestos dust is widespread. Perhaps this is not altogether surprising considering the variety of domestic asbestos products that exist and their wide use in modern building. Present evidence suggests that there is a wide spectrum of pathological changes resulting from asbestos inhalation. Prominence was given recently to the relationship between asbestos exposure and mesothelioma. Possible widespread community contamination by asbestos clearly calls for a full assessment of its carcinogenic properties. Both crysotile and crocidolite have been associated with bronchial carcinoma and mesothelioma, but amosite has not. It follows that both qualitative and quantitative analyses of asbestos in tissues could be most helpful in the further elucidation of this problem. In addition the relationship between asbestos exposure, smoking, and neoplasia formation, requires analysis. -- APCA Absts.

186 Pleural Calcification as a Sign of Silicatosis. M. Kleinfeld. Am. J. Med. Sci. 251, 215-224 (Feb. 1966).

Of the agents capable of producing a pneumoconiosis, only asbestos, talc, and mica (and rarely, free silica) have so far been incriminated in the production of pleural calcifications. Such calcifications following silicate exposure may vary from a few linear or circular plaques over the dome of either or both leaves of the diaphragm or the lateral chest wall to formation of an extensive shell over the whole lung field. The configuration may be bizarre, but the nature of the calcification usually is readily apparent on standard posteroanterior and lateral films. Pleural calcification is usually asymmetric. The plaques are most frequently located over the dome of the diaphragm rather than in other lung areas. Clinical and environmental evaluation was made of eight workers showing varying degrees of pleural calcification from exposure to talc, asbestos, or mica. The minimal duration of exposure was 23 years and the longest, 54 years. Respiratory symptoms, chiefly dyspnea, were present in six. Four of the six showed clubbing. In five,

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the pleural calcification was confined to the diaphragmatic regions. The chest roentgenograms of five showed varying degrees of pulmonary fibrosis. Of the five individuals given pulmonary function tests, the findings were abnormal in four. Of these four, two had impairment in both ventilation and diffusion capacity and two demonstrated ventilatory dysfunction indicative of a restrictive breathing disorder. -- Am. Rev. Resp. Dis. Absts.

187 Deposition and Fate of Inhaled Iron-59 Oxide in Rats. L. J. Casarett and B. Epstein. Am. Ind. Hyg. Assn. J. 27, 533-538 (Nov.-Dec. 1966).

The fate of inhaled Fe_2-$59O_3$ in rats at short intervals of time after inhalation has been studied primarily to evaluate this material for cytokinetic studies of the lung. Following "nose only" types of exposures, complete analyses were performed on tissues and excreta. Upper and lower respiratory tract retention has been presented in two ways. The differences in clearance rates thus obtained are due to a significant early absorption or transport as reflected in carcass values. Suitability of Fe_2O_3 for cell studies is concluded to be adequate, but further emphasis is given to the need for characterization of this aerosol, particularly for solubility and ultrafiltrability in other test uses. There are 17 references. -- Authors' abst.

188 Dust Counting Variability. R. G. Edwards, Jr., C. H. Powell, and Mildred A. Kendrick. Am. Ind. Hyg. Assn. J. 27, 546-554 (Nov.-Dec. 1966).

A dust counting study is described, involving seven people with various amounts of experience, two methods of lighting (lightfield and phase contrast), 30 concentrations, and the counting of two types of particles (grains and fibers). The purpose of this study was to determine the effect of these variables on dust count results. An analysis of variance was made by means of a computer on 8,400 values comprising the basic data. The biggest single source of variation in results is individual differences of the counters. Methods of keeping this variance to the minimum are discussed. Other methods of improving dust count reliability are also presented. There are nine references. -- Authors' abst.

189 Ultra-Clean Operating Rooms. J. G. Whitcomb, et al. Sandia Corp. Reprint SC-R-65-965. 5 pp. (Aug. 1965). Issued by Technical Information Division III, Sandia Corp., Albuquerque, New Mexico.

Air-borne bacteria are held suspect in the pathogenesis of postoperative wound infections. A plan is presented for the definitive control of bacterial contamination in the atmosphere of operating rooms by using the ultra-clean, laminar, down-flow technique. Bacterial monitoring of the air in a laminar flow, industrial clean room substantiates the validity of this concept of air conditioning for use in operating rooms of the future.

190 Applying "Downflow" to Dust-Fume Control in a Plastics Facility. J. A. Kenagy. Sandia Corp. Reprint SC-R-66-922. 3 pp. (June, 1966). Issued by Technical Information Division III, Sandia Corp. Albuquerque, New Mexico.

Toxic components of plastics systems call for special dust-and-fume-exhausting facilities during potting and encapsulating procedures. Sandia Corporation found that a complete laminar down-flow clean room, rather than the bench approach, is the answer for this purpose. The plastic objects involved are produced for a specific aerospace application; but the article is applicable to numerous other plastics operations.

191 The Adaptability of Laminar Air Flow for Contamination Control. R. C. Marsh. Sandia Corp. Reprint SCR-691. 6 pp. (April, 1964). Issued by Technical Information Division, Sandia Corp., Albuquerque, New Mexico.

Laminar air flow in clean rooms is presently much discussed. In this article the author states the Contamination Control requirements for various processes and operations, and the laminar air flow "approach" for each, plus descriptions of available devices for accomplishing these various purposes.

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PHYSICAL ASPECTS OF THE ENVIRONMENT

192 Long-Term Study Relating Temporary and Permanent Hearing Loss. J. Sataloff, et al. Arch. Environmental Health 13, 637-640 (Nov. 1966).

In 1961 a longitudinal study in a large paper plant was initiated in an attempt to answer certain questions concerning the effect of industrial noise on temporary threshold (TT) and on permanent threshold (PT). The authors were especially interested in determining whether permanent threshold shift due to noise could occur in the absence of temporary threshold shift measured within ten minutes after exposure and whether ears exhibiting some amount of temporary threshold shift (TTS) in turn incurred more permanent damage than did ears exhibiting no TTS. There are nine references.

RADIOACTIVITY AND X-RADIATION

193 Chromosome Studies on Women Formerly Employed as Luminous-Dial Painters. J. T. Boyd, et al. Brit. Med. J. 1, 377-382 (Feb. 12, 1966).

Sixty-two former luminizers were found to have a radium body content ranging from not measurable to as high as 0.56 microcurie. A control population of 57 women was chosen within the age limits 35-64 years. Blood cultures were made, and the chromosome abnormalities in lymphocytes counted. It was found that the incidence of abnormal chromosomes was higher in the luminizer group, and that there was a consistent gradient when a grouping by body content of radium was made. The control group was older than the luminizer group. Consequently, the difference may actually be larger, since an increase in abnormal forms with age has been reported.

-- J. Occ. Med. Absts.

194 Effects of Radiation on Learning Ability. J. H. Schulte and J. W. Schulte. Arch. Environmental Health 13, 662-663 (Nov. 1966).

In the past 20 years, the total production of radioisotopes in the United States has increased from less than 100 curies to more than two million curies. During the same period of time, the number of industrial plants using radioactive sources expanded from less than 100 to more than 7500. There are also more than 500 nuclear power reactors which have been constructed during this brief time and there are more than half a million people who are engaged in some form of employment which involves exposure to ionizing radiation. Soviet scientists have extensively studied the effects of radiation on cortical functions as they relate to conditioned reflexes, behavioral reactions, and electrophysiological responses. The purpose of this study was to determine whether or not alterations in the functions of some of the higher learning centers in the central nervous system could be demonstrated in animals exposed to sublethal doses of ionizing radiation. There are five references.

195 The Standard Man in Relation to Internal Radiation Dose Concepts. W. S. Snyder. Am. Ind. Hyg. Assn. J. 27, 539-545 (Nov.-Dec. 1966).

The extension of the Standard Man concept, insofar as radiation protection is concerned, is considered to provide a basis for estimation of dose when exposure of a population is in question. Discussion is organized around three main considerations: (1) data of a physical and chemical nature concerning the principal organs and tissues; (2) data of metabolic nature concerning bodily intake and excretions; and (3) ranges of individual variation that are not uncommon and means of allowing for these differences. There are 12 references. -- Author's abst.

196 Detection of Effects of Ionizing Radiation by Population Studies. G. Hems. Brit. Med. J. 1, 393-396 (Feb. 12, 1966).

By interpolation, one would expect any effects of the low population radiation doses produced by occupational exposure or variation in natural background to be of very low incidence. For statistical significance, then, large populations would be necessary to draw meaningful conclusions concerning this association. Calculation shows that the minimum population size of tens of thousands of man-years would be necessary to detect radiation-induced leukemia, and even more man-generations for the detection of radiation-induced dominant mutations. It appears unlikely that populations of sufficient size with sufficient exposure will be found. Additional problems would attend the selecting of a suitable control population.

-- J. Occ. Med. Absts.

IN REPLY REFER TO: ARLIAMS November 1982

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197 The Evaluation of Risks From Radiation. R.S. Russell.
Health Physics 12, 239 (Feb. 1966).

The imprecision of assessing risks from radiation permits only a definition of the range or "orders of risk" within which effects they may lie. For the somatic effects quantitative estimates of risk have been attempted only for the induction of cancer. "There is no clear evidence, from the human studies, that radiation in small doses will give rise to appreciable 'non-specific life shortening' or to other serious consequences to the exposed individual other than cancer." Radiation-induced leukemia will appear in about 20 persons per million during a period of 10 to 20 years after exposure to 1 rad. The total yield of all other fatal malignancies appears to be comparable to that of leukemia. Thyroid carcinoma appears to have a comparable incidence which is described as a fifth order risk (1×10^{-5}—10×10^{-5} probability). The only comprehensive parameter available currently to assess the effects of radiation on future generations is "genetic death." The exposure of a parental generation of 1 million persons to 1 rad may cause approximately 2,000 genetic deaths during the next ten generations; this "fourth order of risk" corresponds to 0.1% of the natural incidence. A number of reasons are suggested why estimates of genetic death may represent the possible upper limit of the total genetic injury. The average annual occupational exposure of 0.5 rad per year represents a fifth order risk as compared to a fourth order risk of deaths due to other occupational injury, i.e., 100-200 deaths per million male workers in all occupations in England and Wales. -- J. Occ. Med. Absts.

198 Radiobiologic Aspects of the Supersonic Transport. A.C. Upton.
Health Physics 12, 209 (Feb. 1966).

The supersonic transport (SST) will fly at altitudes of 60,000-80,000 ft. At this upper altitude, the galactic cosmic radiation is estimated not to exceed 1-2 mREM/hr. Solar flare radiations, produced intermittently in outbursts associated with sunspots, may be expected to contribute on the average only a small fraction of the total exposure to occupants of the SST. On rare occasions, perhaps once or twice during an 11-year period, a major flare may deliver peak dose rates of as much as 1-10 REM/hr. at 80,000 ft. on polar flights with 0.5-5 REM or more in the first hour and decreasing amounts during the succeeding 12-48 hr. A warning system is necessary to direct the SST to descend to a lower altitude if necessary. If major solar flares are avoided, the cumulative exposures to the crew and passengers should be within permissible limits.
-- J. Occ. Med. Absts.

ENVIRONMENTAL MEASUREMENTS

199 The Evaluation of Efficiency and Variability of Sampling for Atmospheric Nitrogen Dioxide.
F.L. Meadows and W.W. Stalker. Am. Ind. Hyg. Assn. J. 27, 559-566 (Nov.-Dec. 1966).

A study of the efficiency and variability of the sampling system used to collect nitrogen dioxide in the Alabama Air Pollution and Respiratory Disease Study is described. Experimental sampling was conducted with single and multiple bubblers in series, equipped in each case with either fritted-tip or restricted opening air dispersers. Comparative evaluations of 0.4 to 0.5 lpm and 0.2 to 0.3 lpm air-flow rates indicated that higher collection efficiency, but greater variability, can be expected with lower air-flow rates. Fritted-tip bubblers were found to be more efficient, but restricted-opening bubblers are preferable because their variability is about half that of the fritted-tip bubblers. Sampling variability apparently was not affected by ambient air temperatures, humidity, or the concentration of collecting solution used. Collection efficiency, variability, and the method of empirically determining these factors should be specified when reporting ambient atmospheric nitrogen dioxide. There are 13 references. -- Authors' abst.

PREVENTIVE ENGINEERING

200 Practical Designs for Noise Barriers Based on Lead. B. Fader.
Am. Ind. Hyg. Assn. J. 27, 520-525 (Nov.-Dec. 1966).

Acoustical theory predicts that sheet lead and soft plastic materials loaded with finely divided lead should be excellent sound barriers. Seven case histories are given to show how this "limp mass" has been applied in practical problems. -- Author's abst.

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NNBB-0020082

COMMUNITY AIR HYGIENE

201 Animal Exposure Chambers in Air Pollution Studies. R.G. Hinners, J.K. Burkart, and G.L. Contner. Arch. Environmental Health 13, 609-615 (Nov. 1966).

The main objectives in the design and construction of an animal inhalation facility are performance and ease of operation. Any design features, however, that would result in poor performance should be eliminated regardless of contribution to ease of operation and maintenance. The following requirements were considered mandatory in the design and installation of the animal exposure facility described in this report: (1) a source of clean filtered air supply; (2) a constant flow of air; (3) controls to vary air flow over a suitable range; (4) instruments for accurately metering air flow; (5) apparatus for injecting an aerosol or gaseous contaminant into the input air stream; (6) uniform distribution of the input air stream throughout the exposure zone; (7) an air supply cooling system to maintain a constant exposure chamber temperature, despite the animal heat load and variations in ambient temperature; (8) signal devices to indicate failure of operating equipment; (9) provision for exhausting air from the chambers; (10) maintenance of a slight negative pressure to prevent outward leakage from the exposure units; (11) a means of conveniently cleaning the exposure chambers; (12) facilities for taking representative samples of the exposure chamber atmosphere; (13) appropriate sampling ports from which any part of the exposure chamber may be probed; (14) ease of acess to exposure chamber interior, (15) suitable observation windows; and (16) automatic control and recording of exposure chamber variables, such as temperature, humidity, and contaminant concentration. The preceding conditions were all incorporated into the current long-term study. Seven references are given. -- Authors' summary

202 Bacterial Air Pollution From Activated Sludge Units. C.W. Randall and J.O. Ledbetter. Am. Ind. Hyg. Assn. J. 27, 506-519 (Nov.-Dec. 1966).

Large numbers of potentially pathogenic bacteria were collected from the air surrounding activated sludge units, and many persisted for a considerable time and distance. Significantly, the airborne enteric pathogens were greatly outnumbered by bacteria of proved pathogenicity in the respiratory tract. Klebsiella pneumoniae was the pathogen isolated most frequently, and several studies concerning the spread, longevity, and factors of pathogenicity of this organism were conducted. The potential health hazard of the emitted respiratory pathogens was considerably increased by the fact that a large percentage of the aerosol particles transporting viable bacteria were of a size permitting lung penetration. There are 31 references. -- Authors' abst.

203 Effects of Environment Upon Respiratory Function. II. Daily Studies in Patients with Chronic Obstructive Lung Disease. W.S. Spicer, Jr., W.A. Reinke, and H.D. Kerr. Arch. Environmental Health 13, 753-762 (Dec. 1966).

The effects of selected meteorlogic changes and air pollutants upon the mean daily values of ten respiratory function tests obtained from small groups of patients with chronic bronchitis or bronchial asthma has been assessed for two seven-week study periods. A logical biostatistical approach, which places chief reliance upon the multiple regression technique, has been used to sort out major effects from a mass of data. The most important environmental-physiologic relationships appeared to be those associated with temperature, wind speed, barometric pressure, and sulfur dioxide levels. Two distinct patterns of physiologic response were found. In the final analyses, total lung capacity (TLC) and residual volume (RV) were used to exemplify the volume group and airway resistance at functional residual capacity and percentage of the forced vital capacity exhaled in three seconds ($FEV_{3.0}$%) the "resistance" group. Airway resistance and TLC increased as temperature decreased. Airway resistance increased and $FEV_{3.0}$% fell in both patient groups and RV increased in patients with asthma either 14 or 38 hours (or both) following a rise in sulfur dioxide in the second study where the range of sulfur dioxide levels was greater than in the first study. Airway resistance increased and $FEV_{3.0}$% decreased 24 hours after a fall in barometric pressure while TLC and RV rose in patients with chronic bronchitis 14 hours after a drop in wind speed. Particular care has been taken to point out that a direct cause and effect relationship cannot be implied from these significant findings. There are 12 references.
-- Authors' summary

204 Air Pollution and Asthma in Yokkaichi. K. Yoshida, H. Oshima, and M. Imai. Arch. Environmental Health 13, 763-768 (Dec. 1966).

In Yokkaichi (in the central part of Japan along the Pacific coast) where electric power stations, oil refineries, and petrochemical plants exist, growing numbers of bronchial asthma patients have been observed since the plants were put in operation. At Isozu district, where air pollution is the most severe, the prevalence of bronchial asthma involved 2.3% of the total population and

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7.1% of inhabitants over 40. Studies covering the whole of Yokkaichi reveal that the average value of sulfur dioxide by the lead-peroxide method in 13 districts was directly proportional to the prevalence of bronchial asthma. The results of skin tests (house dust) showed positive reactions for only 6.4% of the asthmatic patients in contrast to classical asthma, in which positivity is 50%-90% in Japan. These results suggest that Yokkaichi asthma differs from classical asthma. As for chronic bronchitis, increasing numbers of cases were found by mass screening techniques in polluted districts. There were two to six times as many as in nonpolluted districts. Judging by $FEV_{1.0}$, the number of cases of obstructive impairment among the inhabitants was also increased two to six times. There are six references. -- Authors summary

205 Status of Committee Work on Air Pollution Control Equipment. K.J. Caplan. Am. Ind. Hyg. Assn. J. 27, 567-570 (Nov.-Dec. 1966).

A number of professional societies and trade groups are highly interested in various aspects of the application, performance, and testing of air pollution control equipment. An AIHA manual on the subject is nearing publication. As a matter of current interest, and perhaps leading toward better coordination of effort, all such organizations and committees having a probable interest in this field have been contacted. Their activities are reported, with some detail as to scope and status of highly active groups. An analysis is presented of overlap in individual committee membership. Especially bothersome roadblocks to progress are discussed.

MANAGEMENT ASPECTS

206 Making Off-the-Job Safety Pay — With Interest. M.J. Caserio. J. Occ. Med. 8, 589-592 (Nov. 1966).

The problem of off-the-job safety is a great responsibility and challenge, a matter which should be of great personal concern to all. The industrial physician can help to make the homes and communities of the employees whom they serve better and safer places in which to live. Not only are in-plant programs needed, but community-wide and individual efforts as well. The contributions which the industrial physician can make will produce valuable dividends—life instead of death, health instead of injury, and happiness instead of misery. Off-the-job safety can pay—with interest. -- Author's conclusion

ACCIDENTS AND PREVENTION

207 Barehand Live Line Working on High Voltage. A.C. Chapman. Elec. Eng. 42, 18-19, 21, 23, 25, 27 (Nov. 1965).

Problems in barehand live line working are discussed, including insulation requirements of a suitable platform, the availability and type of suitable equipment, operating controls, safety precautions, hydraulic rams, training of aerial work platform operators and electrical testing of mobile work platforms; also types of jobs which can be carried out barehand. There are 15 references. -- J. Am. Soc.Safety Eng. Absts.

MISCELLANEOUS

208 Environmental Hazards. Urban Solid-Waste Management. M.W. First. New Engl. J. Med. 275, 1478-1485 (Dec. 29, 1966).

Solid wastes, often called refuse, include a wide variety of discarded, and generally useless, materials, resulting from normal community activities. Garbage and rubbish from households, institutions and commercial establishments comprise the largest fraction of municipal waste collections, but bulky objects, such as stoves and refrigerators and, especially, abandoned automobiles, represent more difficult municipal collection and disposal problems. Industrial refuse from factories, power plants and food-processing plants may contain waste materials not usually found in municipal collections, but more often the difference is quantitative rather than qualitative since industrial processes, by their very nature, generate large amounts of one, or a few, kinds of waste products. By contrast, ordinary municipal collections tend to be extremely diverse. An urgent need for better methods of solid-waste management in all sectors of the economy, combined with the powerful stimulus provided by Solid Waste Act funds, is opening up a period of active development and experimentation in solid-waste technology that will result in the rapid introduction of the modern systems now needed. The need will be even more urgent by the end of the century. A most hopeful sign is the current interest among universities and research institutions in tackling solid-waste problems as an interdisciplinary study involving the special skills of urban planners, sociologists and economists, with those of sanitary engineers, public-health administrators and public-works specialists.

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ADDRESSES OF JOURNALS ABSTRACTED

Am. Ind. Hyg. Assn. J.
American Industrial Hygiene Association Journal
U.S. Public Health Service
1014 Broadway
Cincinnati, Ohio 45202

Am. J. Med. Sci.
American Journal of Medical Science
Lea & Febiger
Washington Square
Philadelphia, Pa. 19106

Am. J. Med.
American Journal of Medicine
466 Lexington Avenue
New York, N.Y. 10017

Am. J. Psychiat.
American Journal of Psychiatry
10 Allen Street, P.O. Box 832
Hanover, New Hampshire 03755

Am. Rev. Resp. Dis.
American Review of Respiratory Diseases
1790 Broadway
New York, N.Y. 10019

Am. Surg.
American Surgeon
Williams & Wilkins Co.
428 East Preston Street
Baltimore, Maryland 21202

Ann. Allergy
Annals of Allergy
2542 University Avenue
St. Paul, Minn. 55114

Ann. N.Y. Acad. Sci.
Annals of the New York Academy of Sciences
2 East 63rd Street
New York, N.Y. 10021

Arch. Environmental Health
Archives of Environmental Health
535 North Dearborn Street
Chicago, Illinois 60610

Brit. J. Cancer
British Journal of Cancer
H.K. Lewis & Co., Ltd.
136 Gower Street
London, W.C. 1, England

Brit. J. Dermatol.
British Journal of Dermatology
H.K. Lewis & Co., Ltd.
136 Gower Street
London, W.C.1, England

Brit. Med. J.
British Medical Journal
Tavistock Square
London, W.C.1, England

Chem. Eng. News
Chemical & Engineering News
1155 Sixteenth Street, N.W.
Washington, D.C. 20036

Circulation
American Heart Association
44 East 23rd Street
New York, N.Y. 10010

Conn. Health Bull.
Connecticut Health Bulletin
State Office Building
165 Capitol Avenue
Hartford, Conn. 06115

Elec. Eng.
Electrical Engineering
American Institute of Electrical Engineers
33 West 39th Street
New York, N.Y. 10018

Health Phys.
Health Physics
Pergamon Press, Inc.
122 East 55th Street
New York, N.Y. 10022

J. Am. Med. Assn.
Journal of the American Medical Association
535 North Dearborn Street
Chicago, Illinois 60610

J. Kentucky State Med. Assn.
Journal of the Kentucky State Medical Assn.
3522 Janet Avenue
Louisville, Kentucky 40205

J. Occ. Med.
Journal of Occupational Medicine
Hoeber Medical Div. of Harper & Row Publishers
2 Park Avenue
New York, N.Y. 10016

London Clin. Med. J.
London Clinic Medical Journal
London Clinic, 20 Devonshire Pl.
London, W.1, England

Med. J. Australia
Medical Journal of Australia
Australasian Medical Publishing Co., Ltd.
Seamer Street, Glebe
Sydney, Australia

Medical News
Medical News, Inc.
120 East 56th Street
New York, N.Y. 10022

Med. lavoro
Medicina del lavoro
Cia S. Barnaba 8, Milan, Italy

New Engl. J. Med.
New England Journal of Medicine
10 Shattuck Street
Boston, Mass. 02115

N.Y. State J. Med.
New York State Journal of Medicine
750 Third Avenue
New York, N.Y. 10017

Thorax
British Medical Association
B.M.A. House, Tavistock Square
London, W.C. 1, England

Toxicol. Appl. Pharmacol.
Toxicology & Applied Pharmacology
Academic Press
111 Fifth Avenue
New York, N.Y. 10003

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also available which are convenient and inexpensive. A very simple one is the Johnson-Williams "Gas Indicator Test Kit" which contains sealed gas ampoules filled with methane at atmospheric pressure. For use, an ampoule is broken inside a plastic bottle to give a methane-air mixture equivalent to 22% LEL. Since methane is somewhat more difficult to oxidize than other gases, satisfactory performance on a methane standard assures normal response to other combustible gases and vapors.

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IN THE ABRAMS November 1992

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APPENDIX

Occupancy Classes and Atmospheric Groups*

Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

Class II locations are those which are hazardous because of the presence of combustible dust.

Group A, Atmospheres containing acetylene;

Group B, Atmospheres containing hydrogen, or gases or vapors of equivalent hazard such as manufactured gas;

Group C, Atmospheres containing ethyl ether vapors, ethylene, or cyclopropane;

Group D, Atmospheres containing gasoline, hexane, naphtha, benzine, butane, propane, alcohol, acetone, benzol, lacquer solvent vapors or natural gas;

Group E, Atmospheres containing metal dust, including aluminum, magnesium, and their commercial alloys, and other metals of similarly hazardous characteristics;

Group F, Atmospheres containing carbon black, coal or coke dust;

Group G, Atmospheres containing flour, starch, or grain dust.

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* Taken from 1965 National Electrical Code of the National Fire Protection Association.

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IN THE ARMS November 1967

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INDUSTRIAL HYGIENE FEATURES

The burden of responsibility in suicide and homicide are discussed in Abst. No. 230.

The effect of alcohol on hemopoiesis is described in Abst. No. 231.

Abst. No. 235 surveys the problems of contact lenses in industry.

Information on the ventilatory performance of American physicians is given in Abst. No. 241.

Abst. No. 246 investigates the effect of posture on the plasma cholesterol level.

Abst. No. 253 is concerned about the smoking habits and survival of lung cancer patients.

A report on skin tumorigenesis by an extract of amber petrolatum is given in Abst. No. 262.

Activated charcoal vs "universal antidote" as an antidote for poisons is discussed in Abst. No. 265.

Acute occupational cadmium poisoning is reviewed in Abst. No. 269.

Details on mercury hazard in the manufacture of artificial jewelry are presented in Abst. No. 272.

Liver disease secondary to tetrachloroethylene exposure is discussed in Abst. No. 275.

Abst. No. 278 presents metabolic studies on men exposed to nitrobenzene vapor.

A report on experiments on elimination of dust from human lungs is given in Abst. No. 284.

Data on silica excretion in relation to the chemotherapy of silicosis are given in Abst. No. 287.

Asbestos dust and its measurement is the title of Abst. No. 288.

See Abst. No. 295 for observations from a 26-year sulfur dioxide survey.

FOUNDATION FACTS

STAFF ACTIVITIES:

Dr. Paul Gross, Director of the Foundation's Research Laboratory, will attend a meeting of the American Conference of Governmental Industrial Hygienists TLV Committee to be held in Washington, D.C. on March 30 and 31, 1967

Dr. Robert T.P. deTreville, Managing Director, attended a conference, "Emotional Health—An Industrial Problem," held in Pittsburgh on March 9, 1967 and sponsored by the Tristate Industrial Association and Pennsylvania Mental Health, Inc. On the program were two members of the Faculty of the Foundation's experimental course on Employee Mental Health (See Industrial Hygiene Digest 28:7, pp. i-ii, July 1964 and Nursing Series Bulletin No. 1): Dr. John MacIver, Director Psychiatric Services, U.S. Steel Corporation, and Dr. Jack A. Wolford, Chief, Social Psychiatry, Western Psychiatric Institute and Clinic, University of Pittsburgh. Foundation Trustee Dr. Robert B. O'Connor also participated. (See Editorial on pages ii-v).

PUBLICATIONS: The Foundation is pleased to enclose with this Digest its 1966 Annual Report and a copy of the Engineering Series Bulletin No. 7 entitled "Combustible Gas and Vapor Detectors." Bulletins in preparation by other committees are: "The Pneumoconioses" and "Critical Incident Technique." Material is also being assembled for the second Engineering Committee "Information Exchange Capsule." Comments so far received have been uniformly favorable concerning the new capsule service and its possible application to other technical and professional areas is under consideration.

TRANSACTIONS OF THE 31st ANNUAL MEETING, October 18-19, 1966, have been mailed to the membership. These contain information of importance to industrial management and should be brought to the personal attention of top management. It has been said that, in truth, industrial hygiene is too important today to leave entirely to industrial hygiene technicians. Additional copies available at $2.00 a copy to members, $3.00 to non-members.

32nd ANNUAL MEETING: Plans are being made for the 32nd Annual Meeting, October 10-11, 1967. Members having suggestions for inclusion in the Technical Conferences are urged to forward them directly to the Managing Director for consideration.

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NOVEMBER 1966 ARCHIVES

ADVISORY FELLOW TO ASSIST INDUSTRIAL HYGIENE FOUNDATION RESEARCH

Dr. Ian T. T. Higgins, Professor of Community Health Services and Epidemiology and Director of the Adult Health and Aging Unit, University of Michigan School of Public Health has accepted an appointment of Advisory Fellow to the Industrial Hygiene Foundation.

Dr. Higgins received his medical degree (M. B.) from the London Hospital Medical School in London, England in 1946 subsequently holding hospital appointments in general medicine, pediatrics and diseases of the chest. He obtained his M. D. (the equivalent of Ph. D. in the United States) in 1951. His academic distinctions include the Charrington Prize in Anatomy and the Arnold Thompson Prize in Diseases of Children.

In 1953 he became a member of the scientific staff of the British Medical Research Council's Pneumoconiosis Research Unit advancing to the office of Assistant Director of the Unit in 1962. In 1963 he joined the staff of the University of Pittsburgh Graduate School of Public Health as Professor of Chronic Disease Epidemiology, leaving in December, 1966 to accept his present position.

Among his appointments are Consultant to the Division of Occupational Health, U.S. Public Health Service, and Consultant to the Epidemiology Branch, Communicable Disease Center, Atlanta, Georgia. He is a member of the Committee on Standardization of Techniques for Respiratory Surveys of the American Thoracic Society and the Air Pollution Training Grants and Fellowships, U.S. Public Health Service.

Society memberships in the United Kingdom include Fellow of the Royal Society of Medicine, Member of the Tuberculosis Association, Associate Member of the Thoracic Society and Member of the Society for Social Medicine. In the United States he is a Fellow of the Council on Epidemiology of the American Heart Association, a Member of the American Epidemiological Society and the Council on Arteriosclerosis.

While at the University of Pittsburgh, Dr. Higgins carried forward studies in mining communities in Britain and the United States (West Virginia) to compare prevalence of chronic respiratory disease between miners and non-miners and to obtain international comparisons as well. His talk to the Symposium on "Emphysema in Industry"* indicates the scope of work in which he is currently involved. He also participated in IHF discussions of a central data repository of environmental exposure information and central management of industrial mortality and morbidity experience.

Dr. Higgins' excellent background of training and experience, his unique accomplishments and his desire to extend epidemiologic studies in industry and its workers should aid the Foundation in implementing several of its new and important research undertakings.

* Proceedings published as the IHF Medical Series Bulletin No. 10 "Emphysema in Industry" (1966).

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EDITORIAL

Dr. O'Connor gave this presentation at a conference sponsored by the National Association of Manufacturers and the Center for Occupational Mental Health "Mental Health and the Business Community" in New York on October 21, 1966. He also participated in a similar meeting "Emotional Health—An Industrial Problem" sponsored by the Tristate Industrial Association and Pennsylvania Mental Health, Inc. This paper will soon appear in a book Mental Health and the Business Community.* Dr. O'Connor is a Trustee of IHF. (See Industrial Hygiene Digest 27:8, p. i, (Aug. 1963).

THE CHALLENGE TO AMERICAN INDUSTRY

By

Robert B. O'Connor, M.D.
Vice President-Health Services
United States Steel Corporation

A major challenge to American industry stems from the fact that human beings persist in acting like human beings.

Industrial management is comfortable with measurable, predictable things. Machines, materials, money and manufacturing operations are not uncomplicated, but they are susceptible to measurement, and to a considerable degree causes and effects are predictable. But human beings appear to be human enigmas. Even the most astute executive, with a high degree of intuitive understanding of people, wishes he could measure and manage the people part of his business as confidently as the material part.

This is true in the supervisor's day-to-day relationships with his subordinates. It becomes blatantly and confusingly true if an emotional problem or mental illness is involved. And so, although the title of this conference is Mental Health, a significant part of it will be devoted to mental illness.

Mental illness is not an ideal term here because it is too apt to connote major mental aberrations such as schizophrenic and manic depressive reactions. Industry is concerned with the whole range of human behavior and so a more widely inclusive term, perhaps "emotional problems," would be more useful for us.

Although the problem case presents the more immediate and obvious need, mental health should be the more fruitful long term goal.

Whatever the terms, we will at the outset be talking about people who have some degree of disablement in one or more of the functions of living. From the famous Manhattan study we know that the incidence of emotional problems is high, probably as high as one in four in the general population. One would expect that it would be considerably lower in the industrial population because there is selection at the time of employment and continuing further selection because of continuing at work. There are no equivalent studies of the industrial population, but a good guess-estimate might be one in eight or ten. However, all of us are likely at one time or another to have an emotional problem of a greater or lesser degree of seriousness. So, while mental illness is surprisingly ubiquitous, the incidence of emotional problems in any group, over a long enough time span, will approach 100 per cent.

Most of the major industries today have industrial medical programs of one sort or another. To a significant degree their focus is on organic medical illness. Yet a case of emotional illness can have a far more pervasive and disruptive effect on the functioning of a department. It can be far more subtle and difficult to identify, evaluate and treat.

Subtle, pervasive and disruptive are useful adjectives to describe the characteristics of a majority of emotional problem cases in industry; subtle because the behavior of the individual is often not blatantly normal; pervasive because it can involve a unit or section for a considerable period of time before being properly identified, and disruptive because it so often distorts interpersonal relationships and such relationships are at the core of effective functioning of a unit.

* From the forthcoming book, Mental Health and the Business Community, edited by Dr. Alan McLean, to be published by The Macmillan Company. Copyright © The Macmillan Company, 1967.

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Identification is not always difficult. I once saw a man in industry, at the request of his supervisor, because the man was found regularly using an unconnected telephone that hung on the wall near his machine. Before making any decision he would use that phone to talk with and obtain advice from three sources. They were Bing Crosby, Harry Truman and God—in that order. Without impugning the consultative qualifications of these three sources, one can say with a fair degree of confidence that this was not normal behavior.

On the other hand paranoid ideas (delusions of persecution) may be described with seeming clarity and logic by an individual who appears to be quite intact.

There are numerous clues to identification of an emotional problem, such as manner, demeanor, interpersonal relations, deterioration of work performance, and the like. But in many instances there are no obvious clues. The individual may be bottling up within himself and masking from the rest of the world a painful anxiety or depression. And it must be accepted too that some of these are transient or self-limited, or are resolved more or less successfully by the individual without intrusion or intervention by others.

Once the case is identified, the next step is evaluation, parallel in many ways to determining diagnosis and prognosis in organic medicine. Evaluation in industry is often provided by the industrial physician—with greater or lesser degrees of expertise. Answers are needed to questions such as these: Is the patient dangerous to himself or others? Can he be safely kept at work? Does he have a true psychosis? Would he benefit by referral to an outside psychiatrist? Expert appraisal, that provides more competent answers to questions such as these, is one of the important reasons for having an industrial psychiatrist in the company medical department.

From such appraisal the next step, disposition of the problem case, is derived. Without it, disposition is apt to be fumbling and fumbling is all too common.

These three aspects, identification, evaluation and disposition, will be discussed in greater depth in later sections of this conference.

This brings us to the other side of the coin—the matter of mental health. The great contribution of Freud was to provide information about, and to focus attention on, the molding effect of the multitude of things that surround the evolving personality of infancy and childhood. There is growing awareness, however, that this is but one of four major cause and effect relationships in mental health. In addition to psychological, there are also biological, societal and cultural causes and effects. Knowledge of changes in mood produced by chemicals is growing. "Cultural deprivation" and its effects are in the popular press. As more understanding of the inter-relations of these four factors emerges, the true foundations of mental health will become clearer, and better understanding of the seemingly endless variety of individuality will develop. There are many things we now know, but there are so many yet to be learned that I doubt that anyone can today, in complete confidence, define a practical course that will assure mental health for everyone. To use Elton Mayo's terms, we have now come a long way from the "traditional society" in which the farmer's son inevitably becomes a farmer. Instead we have moved far into an "adaptive society," minus the comforting anchors and roots of tradition, requiring endless adaptation to an almost dizzying rate of change. The ability to adapt to change is one of the hallmarks of mental health.

It is important to note that mental health carries no connotation of loss of individuality nor conformity to some concept of an "average man." Individuality is a part of the very essence of human beings. A search for an average man in an industry is as absurd as a search for an "average" book in a library. All books have covers, and pages and words, arranged in meaningful sequence. But there is an infinite variety of arrangement of words and of the meanings conveyed. And there is a similar variety among human beings.

Also the "normal range" has a blurred periphery. There are some psychoneurotics and obsessive-compulsive personalities whom supervision in industry would classify among their very best workers, because these individuals set such a high standard of performance for themselves. They work well in industry, but at considerable cost and discomfort to themselves.

And now to a question that is especially significant for this conference, a question for which too few facts are as yet available. What is the relationship between mental health and mental illness and the work environment? If the occurrence of emotional problems of greater or lesser severity approaches 100% in a long enough time span, it is patently impossible for industry to contemplate conducting its affairs only with employees who are never subject to emotional problems. While it

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is expected that at the time of the employment consideration the individual who is sufficiently out of touch with reality to merit hospitalization will probably be screened out, it is equally expectable that those who will be employed will bring with them the whole variety of human foibles and frailties. There will be some whose degree of emotional stability is enviable. There will be some who have been wobbling along through life on such an uneven keel that most of their energy is used to keep their own boat bailed out with little energy left over for working and living. The remainder, including you and me, will be somewhere between these two extremes.

In a gross sort of way it is possible for industry to match people and job assignments: the introspective, creative individual may do well in the research department and the hearty, gregarious person may be better suited for the sales department. But when one considers the infinite variety of individualities and our serious inability to measure the emotional content of each job and job situation, it seems highly unlikely that a complete matching of each individual's specific psychiatric make-up with the emotional factors of each job assignment can be accomplished, at least with the present state of the art.

Lacking specifics then, we are led to generalize, and generalizations are always hazardous. Regarding the individual we have said that, beyond Freud's concepts of the psychological molding of infancy and childhood, there are in fact four factors—biological, psychological, societal, and cultural—which interplay in cause and effect relationships in personality structuring. The same four factors can readily be identified in the industrial setting, have a bearing on the emotional climate in an industry, a company or a specific job, and add formidably to the complexity of the subject. During the past several decades there have been, and continue to be, many attempts to extract from these complexities certain "truths" that have broad applicability.

Adam Smith contended that the thing that moved and satisfied men was money. Current theories accept this with some reservations but consider that other things of equal or perhaps greater importance must be in the mix. The famous Hawthorne experiment suggested that attention to the human aspects of the work situation was more important to productivity than the adequacy of light at the work bench. The theory of the "hierarchy of needs" is receiving increasingly wide acceptance, viz., that as the more basic needs of man are fulfilled, needs of a higher order become dominant. Another theory divides human needs into satisfiers and motivators, meaning that fulfillment of certain needs will lead only to satisfaction and not to motivation; other needs are involved with motivating. The theory of "participatory management" has had its ups and downs in recent years. As with other current theories, this one too probably contains a nugget of truth, its application needs more study, and it is too simplistic to be the whole answer. The management theory of Macgregor's "X and Y," Blake's managerial grid, the use of so-called sensitivity training, and many others have their proponents, indeed their ardent supporters today.

There is a truism in medicine to the effect that when a great many types of treatment are in use for a condition, the true etiology of the disorder is unknown and the kinds of treatments available are not wholly effective. This is undoubtedly true regarding interpersonal relations and "emotional climates" in industry. Nevertheless, the fact that so many theories have been developed and so much attention is being given to these matters is salutary and one can hope that a continuance of these efforts will be increasingly productive.

We have said that an employed group contains the variety of foibles and frailties of human beings and that these varying personality characteristics come with the individual to the job. And we have emphasized the individuality of individuals. A monotonous job can be terribly disturbing to one individual, while the same monotony can act as a soothing sedative to another. This is not to say, however, that the emotional climate of the work situation is not important. One can conceive of a climate that is conducive to maximum job satisfaction and optimal productivity as well as minimally disturbing to the emotional state of employees, or even emotionally supportive. Conceiving of such a climate and knowing how to produce it, however, are two different things.

Knowledge in the whole spectrum of the behavioral sciences is growing. Studies range from the microbiology of nervous tissue and computer stimulation of nerve networks, the rapidly emerging science of psycho-pharmacology and clinical studies of various emotional states, to studies of group phenomena of psychologists, psychiatrists, sociologists and others. Industries have departments of personnel research.

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Universities continue their studies of animals and man in controlled and manipulated laboratory environments. But to a growing extent, universities and industries are joining hands to study man at work in the actual work environment. Much knowledge that is useful can be expected to come from this combined effort.

We are in the midst of a "knowledge explosion" in all fields, including the behavioral sciences. As our understandings and insights increase, we face a growing awareness of the need for a loom on which to weave all this into a useful fabric.

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4th AMA NATIONAL CONGRESS ON ENVIRONMENTAL HEALTH MANAGEMENT

Americana Hotel, New York City, April 24-26, 1967

PROGRAM

MONDAY—April 24

Registration

Opening Remarks—James H. Sterner, M.D.

Welcoming Remarks—Charles C. Edwards, M.D.

KEYNOTE: "What Quality of Environment Do We Want?" R. Buckminster Fuller

PANEL I: Medical Determinations

Clinical and Epidemiological Determinations. Richard A. Prindle, M.D.
Evaluation of Biological Findings from Molecular Biology to Man in Final Decision-Making. G. Burroughs Mider, M.D.
Genetics and Environmental Health. Arno G. Motulsky, M.D.
Relating Biochemical Effects to Psychological and Physiological Disorders and Environmental Stress. Lawrence E. Hinkle, Jr., M.D.

Discussion

Luncheon

PANEL II: Operations

Patterns of Environmental Health Agencies in the U.S. and Abroad. Malcolm H. Merrill, M.D.
Organizing Environmental Health Information Systems and Centers. Mel Weisburd
Coordinating Regional Operations: Water Pollution and Supply. Hollis S. Ingraham, M.D.
Coordinating Regional Operations: Air Pollution. S. Smith Griswold
Organization of Industrial Programs in the Development and Manufacture of Control Equipment. Charles M. Heinen

Discussion

TUESDAY—April 25

PANEL III: Responsibilities

Bringing the Scientific Community into Government Decision-Making. R. Keith Cannan, D. Sc.
Environmental Health: A New Challenge to University Education and Research. Barry Commoner, Ph.D.
The Role of Professional Organizations in Environmental Health. Berwyn F. Mattison, M.D.
Utilizing Industrial and Commercial Resources in the Community. E.M. Adams, Ph.D.
The Problem Shed as a Primary Control Jurisdiction. Allen V. Kneese, Ph.D.

TUESDAY—April 25 (continued)

Luncheon—Basic Science Aspects of Research in Environmental Health. Paul Kotin, M.D.

PANEL IV: New Approaches

Restoring the Quality of Our Environment—One Year Later. John W. Tukey, Ph.D.
Urban Ecology—The New Challenge. Arthur A. Atkisson
Potentialities of Systems Approaches. John A. Logan, D.Sc.
Aerojet-General's "California Waste Management Study." B.D. Culver, M.D.
System Analysis and Planning for Public Health Care in New York City. Harvey M. Adelman, Ph.D.

Discussion

WEDNESDAY—April 26

PANEL V: Medical Organizations As Action Units

The Role of the Physician in Environmental Health. James G. Telfer, M.D.
The Role of the Medical Society in Environmental Health. Norman J. Ashenburg, M.D.
Diagnosing Environmental Health Problems and Evaluating the Performance of Official Agencies. Leonard Greenburg, M.D.
Progress Report: Action for Clean Air Committee. Stephen M. Ayres, M.D.

Discussion

Concluding Remarks—James H. Sterner, M.D.

Congress Adjourns at Noon

* *

For further information write to:

Department of Environmental Health
American Medical Association
535 North Dearborn Street
Chicago, Illinois 60610

03122448

March, 1967
Volume XXXI
No. 3

Industrial Hygiene Foundation
4400 Fifth Avenue
Pittsburgh, Pa. 15213

HWBB-0020100

IN IRTA: ARIRAMIS
NOVEMBER 1993

INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

209 Insurance Booklet Tells Research On Drinking-Driving Accidents.

Research into the drinking-driving accident situation in the United States is summarized in a new booklet The Way To Go, by Kenneth A. Rouse, director of rehabilitation services, Kemper Insurance Group, Chicago. The nature and extent of accidents resulting from drinking and driving are beginning to be revealed by current research findings. This research also shows the directions in which more effective prevention and control measures must move. "Considering that there are 98 million drivers in the United States and that 93-1/2 million persons drink," Rouse said, "there must be a substantial overlap of adult drinking and driving." Percentages: This overlap is further indicated by the fact that 79% of men and 63% of women over 21 drink. National Safety Council figures show drinking a factor in as many as half of the fatal motor vehicle accidents which claimed 49,000 lives in 1965. A man weighing 150 pounds and consuming two to three ounces of whiskey, gin or rum of standard 80-90 proof in an hour, would reach a blood-alcohol level of around .05%. The effects would be more severe, where his existing mood may be heightened. Accident Factor: Rouse quoted data from a University of Indiana report which said "Blood-alcohol levels over .04% are definitely associated with increased accident involvement." Copies of the booklet are available by writing the Public Relations Department, Kemper Insurance Group, 4750 North Sheridan Road, Chicago, Illinois 60640. -- AMA News 10, 10 (Feb. 6, 1967)

210 Seat Belts.

The president of the Insurance Institute for Highway Safety said that all states should pass laws making the use of seat belts mandatory. Russell I. Brown, addressing the Texas section of the Institute of Traffic Engineers, said the life-saving and injury-preventing advantages of seat belts are so well established that their use should be compulsory. -- AMA News 10, 2 (Feb. 6, 1967)

211 Air Pollution Apathy.

Industry apathy toward air pollution control drew a blast from John Gardner, Secretary of Health, Education, and Welfare. At hearings recently on S.780, a pollution control bill, he said, "Some firms have made an outstanding effort, but on the whole, industry has tended to do only what public pressure required it to do. If we can bring about a dramatic reversal in this situation, we will move rapidly toward a solution." If little action is taken now, he warned, the public will demand drastic controls no matter how costly, disruptive, or inefficient they may be.
-- Chem. Eng. News 45, 31 (Feb. 13, 1967)

212 No Oil-or Gas-Fired Boilers for Power Plants.

Los Angeles' smog chief will not allow any new oil- or gas-fired boilers for power plants and will also reject applications to replace existing ones. Louis J. Fuller, head of the county's Air Pollution Control District, told a U.S. government task force that all future increases in electric generating capacity must come from nuclear generation or from sources outside the Los Angeles basin. By applying the ban to replacements, Mr. Fuller serves notice that power companies will eventually have to phase out existing fossil-fueled plants. The edict is a new application of a rule now in effect and does not have to be approved by county supervisors.
-- Chem. Eng. News 45, 15 (Feb. 13, 1967)

213 HEW Proposes Evaporation Limits.

John W. Gardner, Secretary of Health, Education, and Welfare (HEW), has proposed additional standards to control air pollution from new motor vehicles. The standards prescribe limitations on evaporative losses from fuel tanks and carburetors and would be effective for new model automobiles and light trucks sold in the U.S. beginning in 1969. On an average trip, an automobile evaporates about 10 grams of gasoline from its carburetor. It also loses about 30 grams daily through the tank cap as a result of pressure changes from the tank's thermal expansion and contraction. HEW estimates that 1 billion gallons of gasoline annually pollute the atmosphere as a result of these evaporations. The new standards limit these losses to 2 grams of gasoline per "test" as specified to manufacturers. The testing procedure simulates an average trip and one gas-tank volume change per day. Recent technological improvements have been made that could reduce these evaporative losses by more than 90%, HEW says.
-- Chem. Eng. News 45, 12 (Feb. 13, 1967)

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214 Analysis Kit for Pesticides.

A portable chemical analysis kit contains laboratory equipment to analyze pesticide residues in food crops. The prototype model, developed by scientists at the Midwest Research Institute, Kansas City, Mo., under a contract with the Department of Agriculture, shows the feasibility of running field analyses on grain, vegetables, fruit, milk, and meat to check whether pesticide residue content exceeds tolerance levels set by the Food and Drug Administration. With little chemical training, food inspectors and graders could measure the residue levels of pesticides from any of the three major classes—chlorinated hydrocarbons, organophosphates, and carbamates. The kit comprises three cases of chemicals, glassware, a 12-volt battery-powered motor which runs a blender and centrifuge, an electrolytic heater fueled with propane, and an ultraviolet light for reading spots on chromatographic plates. -- Chem. Eng. News 45, 47 (Feb. 13, 1967)

215 Radiation Report.

Radioactive Iodine-131 was detected in milk from 28 of 63 U.S. sampling stations since the fifth Chinese Communist nuclear weapons test on December 27. The U.S. Public Health Service said that the highest level found was 210 picocuries per liter of milk in samples in the Charleston, S.C. area. This is far below the level considered as a public health hazard, the Public Health Service said. -- AMA News 10, 2 (Feb. 6, 1967)

216 FDA and the Drug Industry.

The FDA and the drug industry are at it again—this time on the generic vs. brand name issue. The Pharmaceutical Manufacturers Association (PMA) said recently that over the past five months it has asked the Food and Drug Administration (FDA) repeatedly to supply "more meaningful information" on the agency's survey on drug potency. But each time, it claims, FDA failed to do so. The PMA statement follows FDA's release of the names of the companies and products involved in the survey. The study was limited to certain drug categories in which variation in potency is medically significant. FDA claims that 7.7% of the generic drugs tested were above or below acceptable potency levels, compared to 8.8% of the brand name products tested. But "because of FDA's failure to provide (the information)," PMA claims, "it is impossible to determine (the test's) validity." -- Chem. Eng. News 45, 31 (Feb. 13, 1967)

217 LSD Policy.

The Ohio State Medical Association recommended restrictions on the use of lysergic acid diethylamide (LSD), stating that it and other hallucinogens should be administered only by physicians trained in its use. It called on county medical societies to prepare educational materials to enable physicians to easily recognize hallucinogenic, barbiturate, and amphetamine toxicity.
-- AMA News 10, 2, (Feb. 6, 1967)

218 Larynx Replaced.

Physicians at the Massachusetts Eye and Ear Infirmary, Boston, said a 25-year-old Marine was continuing to improve after they replaced his shattered larynx with an artificial tube and valve made from skin taken from the patient's thigh. They said the procedure could be used to restore the voices of many patients who have their larynxes removed because of cancer.
-- AMA News 10, 2 (Feb. 6, 1967)

219 Emphysema Deaths Increase.

Data compiled so far show 20,208 deaths in the United States attributed to emphysema and chronic bronchitis in 1964—a nearly ninefold increase from the 1945 total of 2,300—the new National Center for Chronic Disease Control reports. Further, said Albert Roberts, M.D., chief of the Center's chronic respiratory disease program, these no longer can be considered "male diseases." Of the 1964 death total, 3,145 were women—a quadrupling in a decade.
-- J. Am. Med. Assn. 199, adv. p. 32 (Jan. 30, 1967)

220 American Industrial Health Conference.

The 52nd annual meeting of the Industrial Medical Association and Silver Anniversary meeting of the American Association of Industrial Nurses will be held at the Americana Hotel, New York, April 10-13, 1967. This is the first time that the AIHC has been held in New York.

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221 Need for Mental Health Center.

Only 1.5 of 19 million "disturbed" persons receive some form of treatment. Such disturbances cause 50% of present sick absence, costing about $5 billion a year. Over the next decade, $2 billion in federal support will help build and staff 2,000 Mental Hospital Centers. State and local governments must add $30 billion. -- Business Week (Nov. 5, 1966)

COMING EVENTS

222	April 2- 9	American Petroleum Institute, 7th World Petroleum Congress, Mexico City, Mexico.
	April 7- 9	American Society of Internal Medicine, San Francisco, California.
	April 9-14	American Chemical Society, 153rd National Meeting, Miami Beach, Florida.
	April 9-14	American Pharmaceutial Association, Annual Meeting, Las Vegas, Nevada.
	April 10-12	Institute of Environmental Sciences, 13th Annual Technical Meeting and Equipment Exposition, Washington, D.C.
	April 10-13	American Industrial Health Conference, New York, N.Y.
	April 10-13	Aerospace Medical Association, Washington, D.C.
	April 13-15	American Society for Cancer Research, 58th Annual Meeting, Chicago, Illinois.
	April 16-21	Federation of American Societies for Experimental Biology, Annual Meeting, Chicago, Illinois.
	April 17-19	American Association for Thoracic Surgery, New York, N.Y.
	April 17-21	American Society for Experimental Pathology, Chicago, Illinois.
	April 17-19	TAPPI, 4th Water Conference, Philadelphia, Pennsylvania.
	April 18-19	American Zinc Institute, Annual Meeting, Chicago, Illinois.
	April 18-20	American Federation of Information Processing Societies, Spring Joint Computer Conference, Atlantic City, New Jersey.
	April 20-22	Institute of Sanitation Management, Western Regional Conference, Los Angeles, California.
	April 24-26	National Academy of Sciences, Annual Meeting, Washington, D.C.
	April 24-26	National Congress on Environmental Health Management, 4th AMA Congress, New York, N.Y.
	April 24-29	American Academy of Neurology, San Francisco, California.
	April 26-27	International Lead Zinc Research Organization, Annual Meeting, Montreal, Quebec, Canada.
	April 26-28	American College of Clinical Pharmacology and Chemotherapy, Atlantic City, New Jersey.

LEGAL DEVELOPMENTS

223 The New Law and the Mentally Ill in Pennsylvania.

This law exemplifies local application of Federal legislation. Industry has much to gain from assisting in this community effort. There is doubt that the program can succeed without industrys interested involvement. This legislation, which provides opportunity for progress in mental health, climaxed two years of work on the part of 3,000 volunteers in Pennsylvania. The degree of interest by industry is indicated in an editorial by Dr. Robert B. O'Connor, Vice President-Health Services, United States Steel Corporation—See pages ii-v, this issue.
-- Pa. Mental Health Bulletin (Jan. 1967)

BOOKS, PAMPHLETS, AND NOTICES

224 Toxicity and Metabolism of Industrial Solvents. Ethel Browning. AVAILABLE FROM: American Elsevier Publishing Company, Inc., 52 Vanderbilt Avenue, New York, N.Y. 10017. xi + 739 pp. (1965). PRICE: $32.50.

Dr. Browning's "Toxicity of Industrial Organic Solvents," published in 1953 (now out of print) has become a standard reference for toxicologists and occupational physicians. Dr. Browning's personal experience included pathology (Assistant Pathologist at St. Paul's Hospital, London) and institutional medicine (School Medical Officer in Liverpool) before beginning her association

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with industrial medicine. In 1940, she was appointed H.M. Medical Inspector of Factories, Ministry of Labour and National Service, London. She was especially concerned with hematological studies of workers with ionizing radiation, and later with all toxic solvents. She has received awards in physiology (The Holt Medal) and pathology (The Kauthack Medal). She is an advisor on toxicology to the Courtauld Organization and an Honorary Member of the American Industrial Hygiene Association. In addition to the above text on solvents, she has written numerous other books, including "Toxicity of Industrial Metals" and "Harmful Effects of Ionising Radiation." "Toxicity and Metabolism of Industrial Solvents" has been completely rewritten, with special attention to the latest information on metabolic effects. In her preface, the author thanks Drs. F.A. Patty (Editor of "Industrial Hygiene and Toxicology" Interscience Publishers, N.Y.) and R. Tecwyn Williams (author of "Detoxication Mechanisms"—Chapman and Hall, London) whose "innumerable references not only to published articles but also to their personal researchers, have been invaluable..in providing.. at least a starting point..into this vast subject." The author's richly referenced but narrative style provides the reader with an entré to the world's literature on each solvent covered. She adds value judgments based on extensive personal experience. Of the first 140 pages, devoted to aromatic hydrocarbons, the first 65 deal with benzene alone in great detail. Each solvent's properties, formula, economy, sources and uses are given, as well as its biochemistry (estimation in the atmosphere, in biologic tissues and fluids) metabolism and toxicology (symptoms of intoxication, changes in the organism and toxicity to human beings). Profuse references are provided—in the case of Benzene alone there are 11 pages of bibliography. Reference is made in the text to authors and dates rather than to numerical bibliographic reference.

225 Organic Pesticides in the Environment. Advances in Chemistry Series 60. R.F. Gould, Editor. AVAILABLE FROM: American Chemical Society, 1155 Sixteenth Street, N.W. Washington, D.C. 20036. x + 309 pp. (1966). PRICE: $8.50.

This is a collection of papers on the environmental hazards of organic pesticides, including their sorption and leaching in soils, residues in waterways, and translocation by air and rain. It surveys effects on mammal enzyme systems, residues in human body tissues, and the effects of chronic poisoning by organophosphorus insecticides. Methods of sampling and analysis are included, such as infrared identification of chlorinated insecticides and electron capture chromotography to determine organic insecticides in water. Of special interest are papers on: Sorption and Leaching of 4-Amino-3, 5, 6-trichloropicolinic Acid in Soils; Urinary p-Nitrophenol Concentrations in Acute and Chronic Parathion Exposures; Effects of Chronic Poisoning by an Organophosphorus Cholinesterase Inhibitor on Acetylcholine and Norepinephrine Content of the Brain; Distribution of Pesticide Residues in Human Body Tissues from Montgomery County, Ohio; Respiratory Exposure of Dairy Animals to Pesticides; Potential Hazard in Using Dichlorvos Insecticide Resin; and Persistence of 2, 6-Dichlorobenzonitrile in Aquatic Environments.

226 A Digest of State Air Pollution Laws—1966 Edition. Public Health Service Publication No. 711. U.S. Department of Health, Education, and Welfare, Public Health Service. AVAILABLE FROM: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. ii + 292 pp. (1966). PRICE: $1.50.

This publication was prepared especially for the National Conference on Air Pollution held on December 12-14, 1966 in Washington, D.C. by the U.S. Department of Health, Education, and Welfare, Public Health Service, Director of Air Pollution. It will be of great interest to all who have responsibilities requiring that they keep abreast of Federal and State Legislation in Air Pollution Prevention and Control. In view of the dynamic situation which exists in this legislative area (described by Andrew Kalmykow, American Insurance Association, in a talk "Recent Legislative Developments" presented at the Foundation's 31st Annual Meeting last October, and included in the Transactions of the meeting) information contained in this reference cannot be considered current, and must be up dated frequently by the user. Nevertheless, it should be a useful reference to readers of Industrial Hygiene Digest.

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INDUSTRIAL MEDICAL PRACTICE

MWBB-0020102

227 Occupational Inadequacy. An Inquiry Into the Inadequate Personality. D.G. Mayfield, et al. J. Occ. Med. 9, 1-8 (Jan. 1967).

This study indicates that examination of occupational performance can be quite fruitful. Performance in this sphere is a good index of global personality factors in many individuals and possibly the most revealing in some. In view of the heightened interest in psychiatric rehabilitation and the national interest in unemployment, it is likely that we will meet increasing demands on our knowledge in this area. Patients who have previously been considered inaccessible to psychiatric treatment are now projected into plans for comprehensive psychiatric programs. Our ability to deal with many of these problems is severely limited—and the inadequate personality constitutes one of the problem areas. The first step in solving the problem of causation and proper therapy is identification and verification of the syndrome under consideration. We feel that we have accomplished this with our limited study. It is hoped that a more intensive investigation of a large number of similar patients will provide the answers necessary for dealing with this baffling but most interesting entity. -- Cond. from authors' summary

228 Psychodynamic Mechanisms of Emotional Illness in Executives. S. Lesse. Int. J. Soc. Psychiat. 12 (1), 24-28 (1966).

During the early development phase, the young organization man develops a massive dependency upon the company. Teamwork is stressed and individuality is frowned upon. But the junior executive, if he is to rise in the company, must develop a happy balance between his group-dependency feelings and his need for individual expression. When he is rejected by the organization through discharge, lack of promotion, or seeing other men promoted ahead of him, emotional crises are often the result. For top executives, the stresses of work pressure, demands of stockholders, and competition from younger men can cause emotional illness and even exhaustion. Retirement, too, can become a threatening problem for those intellectually, emotionally, or culturally unprepared for it. Hypochondriasis and psychosomatic illness, both with underlying deep depression, are patterns frequently seen in executives. Aggravation, frustration, guilt feelings, and damaged self-image are also results of executive stresses. The emotional problems of executives should receive more attention from industrial psychiatry than they have so far if progress is to be achieved. -- J. Occ. Med. Absts.

229 Social Factors in Suicide. G.E. Murphy and E. Robins. J. Am. Med. Assn. 199, 303-308 (Jan. 30, 1967).

Two diagnostic groups, affective disorder (depression) and alcoholism account for the majority of urban suicides. Alcoholic suicides are more often divorced, separated, or living alone than is the general population. Suicides with affective disorder differ little from the U.S. population except in the proportion living along. Unlike the affective disorder group, alcoholics are found frequently (32%) to have experienced obvious disruption of affectional relationships within six weeks of suicide. The findings suggest that suicide is often a response to social disturbance in alcoholism, chiefly to depressive symptoms in affective disorder. The alcoholic appears particularly vulnerable to suicidal impulses on losing an important affectional relationship. This knowledge should improve suicide prevention. There are 17 references. -- Authors' abst.

230 The Burden of Responsibility in Suicide and Homicide. P. Solomon. J. Am. Med. Assn. 199, 321-324 (Jan. 30, 1967).

In all cases of possible impending suicide or homicide, the physician must assess the burden of responsibility as he evaluates the patient's total situation. Repugnant though it may be, he may have to act against the patient's wishes in order to protect the patient's life and that of others. Thoughts, threats, and plans of violence cannot be dismissed lightly; preparatory actions and attempts cannot be dismissed at all. -- Author's conclusions

231 Effect of Alcohol on Hemopoiesis. A.H. Waters, A.A. Morley, and J.G. Rankin. Brit. Med. J. 2, 1565-1567 (Dec. 24, 1966).

A study of 16 alcoholic patients without cirrhosis showed that disturbance of hemopoiesis was common even in the absence of anemia. Radioactive ferrokinetic studies with Fe-59 in six subjects showed depressed iron utilization by the bone marrow which improved after withdrawal of alcohol. There was cytoplasmic or nuclear vacuolation of early myeloid and erythroid precursors in the bone marrow of 14 of the 16 patients, and in 10 of these patients one week after withdrawal of alcohol the vacuolation had disappeared in 9, and was much less obvious in one. These observations

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suggest a direct toxic effect of alcohol on the bone marrow. There was also a high incidence of both folate (approximately 50%) and iron (approximately 30%) deficiency, but none of the patients was B_{12} deficient. -- J. Am. Med. Assn. References & Reviews

232 Death From Appendicitis and Appendectomy. J.G.R. Howie. Lancet 2, 1334-1337 (Dec. 17, 1966).

A detailed survey of 805 deaths from appendicitis or appendectomy in Scotland from 1954 to 1963 is presented. Death rates for appendicitis of different degrees of severity in adults at different ages are calculated and an estimate made of the risk of death from nonoperative treatment of mild appendicitis in the young adult. The death rate in each age group rises sharply with advance of the pathological changes in the appendix, and mortality for each pathological change advances with increasing age of the patient. Mortality for males was twice that of females in the same age and pathological group. For the young adult patient the mortality of removing a normal appendix (1/5,000) seems to be less than the mortality of failing to remove an abnormal appendix (1/850) to (1/2,300). Evidence is presented to support the belief that there has been a fall in the incidence of true appendicitis. No evidence is found to support the belief that teaching and nonteaching hospitals offer a different prognosis in their treatment of appendicitis.
-- J. Am. Med. Assn. References & Reviews

233 Results of the Surgical Treatment of Spondylolisthesis. E.D. Henderson. J. Bone Joint Surg. 48, 619 (June, 1966).

The consensus of present medical opinion is that spondylolisthesis is an acquired anomaly. Very rarely the cause is a single trauma, but the great majority are due to a series of minor traumas. The result of these traumas is a stress fracture through the pedicles of the involved vertebrae or the pars interarticularis. The lumbosacral level was involved in 190 of 216 patients operated on consecutively. Spinal fusion was performed on the majority of patients. All but 12 were allowed to be up, with belt or corset, within two weeks of operation. Nerve roots were explored at operation in more than 130 patients, and in 46 instances protrusion or extrusion of intervertebral disks was found. This is a higher incidence of this defect than most series report.
-- J. Occ. Med. Abstr.

234 Clinical Applications of a Transcutaneous Ultrasonic Flow Detector. R.F. Rushmer, et al. J. Am. Med. Assn. 199, 326-328 (Jan. 30, 1967).

Blood flow in vessels deep within the body can now be detected via ultrasonic beams emitted by transducers positioned on the skin surface. The velocity of blood flow modulates ultrasonic waves to produce audible signals in accordance with the Doppler shift principle. The transcutaneous Doppler flow detector has shown value in detecting live fetuses early in pregnancy (10 to 12 weeks) locating the placenta, and in exploring peripheral blood vessels to determine the site and severity of arterial occlusive disease, particularly in the extremities. Additional applications are currently under study. More important, this development is a small step in the acquisition of clinical information by means of nondestructive techniques which are applicable to routine clinical diagnosis. There are eight references. -- Authors' summary

235 Contact Lenses in Industry. S.L. Fox. J. Occ. Med. 9, 18-21 (Jan. 1967).

Contact lenses are causing increasing problems for the industrial surgeon. Contact lenses have no place in industry where dusty work environment or where foreign-body or chemical hazards are present. The industrial physician must make a decision in each individual situation. If contact lenses are permitted, the wearer must be identified and known to the plant medical department. The medical department should periodically test and record the employee's vision with and without contact lenses, as well as with spectacles. Special care is required in carrying out the visual-acuity testing during pre-employment physical examinations to insure that a contact lens wearer is not missed and his vision recorded as being normal, when in fact it is markedly deficient. It is also necessary to maintain a constant watch over older employees who may be fitted with contacts without reporting the same to the medical department. The patient with aphakia after an operation for cataract requires special handling if he is allowed to return to work with contact lenses. Placement of the one-eyed, the individual with contact lenses, the aphakic, and the highly myopic are all situations which the industrial physician must evaluate on the basis of the individual involved and upon the desires of management. Six references are given.
-- Author's summary

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MWB-0020103

236 Prevalence of Chronic Respiratory Disease in a Pulp Mill and a Paper Mill in the United States. B.G. Ferris, Jr., W.A. Burgess, and J. Worcester. Brit. J. Ind. Med. 24, 26-37 (Jan. 1967).

A sample of 147 men drawn from the workers in a pulp mill was compared with one of 124 men from a paper mill. The former included those exposed to chlorine and the latter to sulfur dioxide. No significant differences were found in respiratory symptoms or in simple tests of ventilatory functi in the two samples, but men working in chlorine had a somewhat poorer respiratory function and more shortness of breath than those working in sulfur dioxide. The working population of both mills together had a lower prevalence of respiratory disease than that of the male population of Berlin, New Hampshire, previously studied, suggesting that working populations may not be representative of the general population. Further, a low prevalence of disease in a working population exposed to pollutants may not indicate their "safety" in general populations. -- Authors' abst.

237 Museum Preparations of Segments of Human Lung. D.H. Tompsett. Med. Biol. Illus. 17, 2-4 (Jan. 1967).

A detailed method is given for the preparation of colored segmental lung specimens. Full expansion of the lung is ensured by filling each segment with gelatin. Sufficient colored synthetic resin is injected before the gelatin solution sets to differentiate each segment clearly. The result is greatly superior to that produced by injecting colored gelatin.
-- J. Am. Med. Assn. References & Reviews

238 Chronic Bronchitis in Miners and Non-Miners: An Epidemiological Survey of a Community in the Gold-Mining Area in the Transvaal. G.K. Sluis-Cremer, L.G. Walters, and H.S. Sichel. Brit. J. Ind. Med. 24, 1-12 (Jan. 1967).

An epidemiological survey to determine the prevalence of chronic bronchitis in a mixed mining and non-mining population of Carletonville on the Witwatersrand is described. Eight hundred and twenty-seven men over the age of 35 years were investigated. Chronic bronchitis is shown to be significantly more common in miners than in non-miners for every age and smoking categroy with the exception of the non-smoker. In the non-smoker no significant difference exists in the prevalence of chronic bronchitis between the mining and non-mining groups. Smoking habits were found to have overwhelming effects on the prevalence of chronic bronchitis in both groups. It is suggested that a synergistic interplay of smoking and general underground aerial pollution (rather than dust inhalation alone) is responsible for the excess prevalence of chronic bronchitis in the miner who smokes. -- Authors' abst.

239 Long-Term Efficacy of Oil-Adjuvant Influenza Vaccine in an Industrial Population. R.W. Howell. Brit. J. Ind. Med. 24, 66-70 (Jan. 1967).

The mild influenza epidemic of mixed A and B strains early in 1966 provided an opportunity to assess the efficacy of an oil-adjuvant influenza vaccine which had been administered more than two years earlier to 1,341 volunteers at two U.K. Atomic Energy Authority establishments. At the 5% confidence level, a statistically significant reduction in sickness absence due to influenza was found in this vaccinated group when compared with a control group of 918 employees. This trend was observed at both establishments. Some confirmation was thus obtained of serological predictions that protection would last two to three years or longer after inoculation. There was some indication that the vaccine might be more effective in older workers. This trial suggests the need for more long-term evaluation of oil-adjuvant influenza vaccines. -- Author's abst.

240 Ventilatory Function in Relation to Mining Experience and Smoking in a Random Sample of Miners and Non-Miners in a Witwatersrand Town. G.K. Sluis-Cremer, L.G. Walters, and H.S. Sichel. Brit. J. Ind. Med. 24, 13-25 (Jan. 1967).

The ventilatory capacity of a random sample of men over the age of 35 years in the town of Carletonville was estimated by the forced expiratory volume and the peak expiratory flow rate. Five hundred and sixty-two persons were working or had worked in gold mines and 265 had never worked in gold mines. No difference in ventilatory function was found between the miners and non-miners other than that due to the excess of chronic bronchitis in miners. -- Authors' abst.

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241 Ventilatory Performance of American Physicians—A Pilot Study. F. J. McIlreath and B. M. Cohen. Am. J. Med. Sci. 252, 35-41 (July, 1966).

Between one-third and one-quarter of the 262 physicians surveyed presented ventilatory evidence suggesting the presence of obstructive ventilatory disease. Abnormalities of ventilatory capacity testing were more common among cigarette smokers than among pipe or cigar smokers or non-smokers. There are 27 references. -- Public Health Eng. Absts.

242 Epidemiological Study of Sudden and Unexpected Deaths Due to Arteriosclerotic Heart Disease. L. Kuller. Circulation 34, 1056-1068 (Dec. 1966).

A study of sudden and unexpected nontraumatic deaths among Baltimore residents between the ages of 20 to 64 was conducted between June 15, 1964, and June 14, 1965. After adjusting for sampling, it was estimated that 1,178 (32%) of 3,648 deaths were sudden; arteriosclerotic heart disease (ASHD) accounted for 58% of these. Sixty percent of all ASHD deaths were sudden. Of 1,033 ASHD deaths in Baltimore city, between the ages of 40 to 64, 20.6% occurred outside of a hospital, 46.2% were dead on arrival, and only 18.9% occurred after 24 hours of hospitalization. Approximately half of the ASHD sudden deaths had a history of heart disease and 24% had seen a physician within a week prior to death. Because of the rapidity and high frequency of deaths that occur outside of a hospital, a combination of better hospital treatment and earlier diagnosis is needed to reduce ASHD mortality. -- J. Am. Med. Assn. Reference & Reviews

243 Cardiovascular Disease, Diabetes Mellitus, and Anthropometric Evaluation in Polynesian Males on the Island of Niihau (1963). D.R. Bassett, et al. Circulation 34, 1088-1097 (Dec. 1966).

A study of 30 adult Polynesian males living on the isolated Hawaiian island of Niihau was conducted in October 1963. These relatively pure Polynesians were distinctly overweight, had a high prevalence of diabetes, and were hypertensive. Hematocrit and whole blood viscosity were elevated. Serum uric acid levels were normal. Although Hawaiians generally have a high mortality from coronary heart disease, the average serum cholesterol level for this group was 30 to 40 mg./100 cc. lower than in most populations having a high prevalence of coronary heart disease.
-- J. Am. Med. Assn. References & Reviews

244 Anesthesia and Recent Myocardial Infarction. J.G. Fraser, P.R. Ramachandran, and H.S. Davis. J. Am. Med. Assn. 199, 318-320 (Jan. 30, 1967).

A review has been made of mortality statistics associated with surgery in patients with recent myocardial infarction. The overall mortality figures compare closely with those of coronary-disease patients not involved in surgery or anesthesia. The authors' findings support the concept that elective surgery should be postponed until the end of the healing stage (three months). Essential surgery performed during the early postinfarction period carried a very high risk. The prognosis following surgery performed after the first 15 days postinfarction was significantly improved. There are 12 references. -- Authors' abst.

245 Hyperglycemia After Acute Myocardial Infarction. Its Relation to Diabetes Mellitus. K.K. Datey and N.C. Nanda. New Engl. J. Med. 276, 262-265 (Feb. 2, 1967).

Glucose tolerance tests were carried out in 145 out of 167 consecutive cases of acute myocardial infarction within 72 hours of the onset of the attack, after 7 to 10 days and after one month. Sixty-five per cent of the patients showed initial hyperglycemia, which persisted at the end of 7 to 10 days. At the end of one month this number was reduced to 29%. Follow-up studies were carried out in 57 cases at the end of one or two years. The incidence of hyperglycemia was 70% at the onset of the attack and at the end of 7 to 10 days. The hyperglycemia was transient in 38% of the cases, its duration being 11 to 30 days in 23% and between one month and one or two years in 15%. Delayed return of the curves to normal in these cases can lead to an erroneous diagnosis of diabetes mellitus. Myocardial infarction unmasked latent diabetes in 14% of the patients whereas 17% still had abnormal curves but no clinical diabetes. Patients with initial normoglycemia did not show any tendency to diabetes. The incidence of hyperglycemia was higher in persons over than in those under 50 years of age at each period of testing. A comparison of clinical and electrocardiographic findings between the normoglycemic and the hyperglycemic patients revealed no significant differences. The possible mechanism of hyperglycemia is discussed.
-- Authors' summary

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HHBB-0020104

246 Effect of Posture on the Plasma Cholesterol Level. D.J. Stoker, V. Wynn, and G. Robertson. Brit. Med. J. 1, 336 (Feb. 1966).

On changing from the lying to the standing position there is a loss of blood volume and an increase in the concentration of plasma proteins. Plasma cholesterol is nonfilterable, and so may vary with body position. Plasma cholesterol was measured on samples obtained after a minimum of one hour recumbency, after walking about, and after a sphygmomanometer cuff inflated to 100 mg. had been applied. There was a mean rise in cholesterol of 12.9% after 15 minutes in the vertical position in both normal subjects and those with hypercholesterolemia. Application of the blood-pressure cuff produced a further rise in the hypercholesterolemic patients. Ideally, for accurate comparisons of cholesterol levels, the patient should be supine for 20 minutes prior to withdrawal of the sample. -- J. Occ. Med. Absts.

247 Palpable Spleens in College Freshmen. O.R. McIntyre and F.G. Ebaugh, Jr. Ann. Internal Med. 66, 301-306 (Feb. 1967).

In 2.86% of 2,200 entering college students palpable spleens were detected by at least three independent examiners. Of the 63 students studied, approximately 30% persisted with this finding for at least three years after the initial detection. The finding of a palpable spleen could not be explained on the basis of body habitus or infectious mononucleosis. In the first six years of study there is no evidence for an increased prevalence of disease in the group of students with palpable spleens. The subsequent medical history of this group will be determined. Eight references are given. -- Authors' summary

248 Factors in a Total Rehabilitation Program for Low Back Pain. J.N. Schaeffer. J. Occ. Med. 9, 12-15 (Jan. 1967).

The variety of factors at work among cases of chronic or recurrent low back pain calls for close teamwork in evaluating the problems which perpetuate the symptoms. Needless treatment may be avoided if the resources of the psychologist, the social worker, and the vocational counseler are used in a realistic approach to the basic problem, rather than excessive attention to the presenting symptoms. Four references are given. -- Author's conclusion

249 Survey on Smoking. B.A. Cook. Med. J. Australia 1, 363-365 (Feb. 26, 1966).

The literature relevant to smoking and maglignant disease is reviewed. Mortality rates for cigarette smokers are compared with those for non-smokers. The social aspects associated with prohibition of smoking and education are discussed. It is concluded that Australians should become more actively interested in the problem posed by the tobacco habit. -- APCA Absts.

250 Nitrosamines as Environmental Carcinogens. II. Evidence for the Presence of Nitrosamines in Tobacco Smoke Condensate. W.J. Serfontein and P. Hurter. Cancer Research 26, 575-579 (April, 1966).

Trace amounts of N-nitrosamines in biological material were determined qualitatively and semi-quantitatively by conversion of the nitrosamines into the corresponding asymmetrical hydrazines. The hydrazines were selectively concentrated by extraction techniques and identified by means of thin-layer chromatography after reaction with 4-nitro-azobenzene-4'-carboxylic acid chloride. There are 11 references. -- Public Health Eng. Absts.

251 Cardiac Output, Blood Pressure and Free Fatty Acid Responses to Smoking in the Nonbasal State. W.S. Frankl, R. Friedman, and L.A. Soloff. Am. J. Med. Sci. 252, 73-78 (July, 1966).

The dye dilution technique and the method of Bragdon were used in measurements taken before smoking, during smoking, and at four 15 minute intervals in six normal subjects in the nonbasal state. Cardiac output and free fatty acids were elevated prior to smoking. In none of the subjects was there a significant further rise in cardiac output or free fatty acids after smoking. These findings cast some doubt on whether tobacco actually exerts any signficant effect on cardiac output, stroke volume, or blood free fatty acids in the nonbasal state. There are 15 references. -- Public Health Eng. Absts.

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252 Reduced Benzo(a)pyrene and Phenolic Content of Smoke From Experimental Cigarettes. R.J. Shamberger. Nature 211, 86 (July 2, 1966).

An extraction process applied to soybean leaves that greatly reduces the tar content, phenols, benzo(a)pyrene, and toxic substances indicates the possibility of designing a relatively safe cigarette. There are 12 references. -- Public Health Eng. Absts.

253 Smoking Habits and Survival of Lung Cancer Patients. Application of the Temporary Expectation of Life as a Measure of Survival. T. Abelin. Am. J. Epidemiology 84, 110-119 (July, 1966).

Except for a statistically insignificant trend among localized cases, no association could be found between smoking habits and survival experience. If an association exists, it must be small and can be detected only by using much larger study populations. There are 12 references. -- Public Health Eng. Absts.

254 Measurement of Polonium-210 in Human Blood. J.B. Little and R.B. McGandy. Nature 211, 842-843 (Aug. 20, 1966).

The measurement of Po-210 concentration in blood may be a practical method of estimating body burdens of this isotope, as well as of its parent Pb-210. Data from experiments on effect of smoking and diet on Po-210 concentration in the blood are given. There are seven references. -- Public Health Eng. Absts.

255 Study of Smoking in Relation to Occupation. F. Aubry, et al. Can. J. Public Health 57, 335-342 (Aug. 1966).

Results of a survey of smoking habits, especially cigarette smoking, of a group exposed to industrial dusts and another group not exposed indicated that the first group was higher in the percentage of smokers, the quantity of cigarettes smoked daily, and the length of time since the smoking habit was begun. A comparison of subjects with similar duties indicated the difference is not influenced by the age of the smoker, but by the environment in which he works. -- Public Health Eng. Absts.

256 Ciliastatic Components in the Gas Phase of Cigarette Smoke. O.A. Roholt and D. Pressman. Science 153, 1248-1250 (Sept. 9, 1966).

When the gas phase of cigarette smoke, separated into its components by gas chromatography, was passed across a ciliated specimen, the acetaldehyde, acrolein, and hydrogen cyanide produced strong inhibition of the ciliary beat. A filter that removed most of the acetaldehyde and acrolein from smoke did not reduce the inhibitory effect of the gas phase of the smoke, whereas a filter that removed most of the hydrogen cyanide did reduce inhibition. There are 13 references. -- Public Health Eng. Absts.

257 The Depressant Effect of Cigarette Smoke on the In Vitro Antibacterial Activity of Alveolar Macrophages. G.M. Green and Diana Carolin. New Engl. J. Med. 276, 421-427 (Feb. 23, 1967).

In an in vitro phagocytic system using rabbit pulmonary alveolar macrophages small amounts of cigarette smoke quantitatively inhibited the capacity of the cells to inactivate Staphylococcus albus bacteria. The inhibiting action of the smoke, as obtained from the burning cigarette, varied quantitatively with the volume of smoke used, the type or brand of cigarette and the kind of filtration (mechanical or aqueous) employed. The active component of the smoke was largely contained in the gaseous and filterable phase. The toxic action of the smoke was greatly reduced by aqueous filtration and was subsequently demonstrable in the aqueous phase. Nicotine, acetaldehyde, formaldehyde and cyanide did not by themselves affect the alveolar macrophages in doses comparable to their content in smoke. Cells exposed to cigarette smoke did not adhere to the surface of the flask in which the experiments were performed. Cell viability, as measured by the ability to exclude vital dye, was not affected by the smoke. The role of cigarette smoke in the pathogenesis of pulmonary diseases may be mediated through an inhibition of the phagocytic activity of alveolar macrophages and impairment of this integrated defensive function at the respiratory membrane level of the lung. There are 16 references.

-- Author's summary

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HUBB-0020105

258 Methoxyflurane as an Obstetric Analgesic: A Comparison With Trichloroethylene. V. Major, M. Rosen, and W.W. Mushin. Brit. Med. J. 2, 1554-1560 (Dec. 24, 1966).

Methoxyflurane and trichloroethylene were compared as obstetric analgesics by an anesthetist w[illegible] also continuously graded the behavior and reactions of the mother during and between contraction[illegible] From these observations the percentage of the duration of inhalation, when all factors were simu[illegible]taneously satisfactory, was calculated. Methoxyflurane was significantly better than trichloro-ethylene as judged by this assessment: more mothers receiving methoxyflurane were satisfied w[illegible] the pain relief. The midwives were unable to distinguish any difference in pain relief but found that more patients receiving trichloroethylene were restless ($P < 0.05$). Patients receiving methoxy-flurane were slightly more drowsy. A continuous recording of the inhaled concentrations was made for each patient. From the range of concentrations required, it was deduced that methoxyflurane was suitable for intermittent administration in a single fixed inhaled concentration.
-- J. Am. Med. Assn. References & Reviews

259 Partial Inhibition of the Laser Reaction in Man by Topical Corticosteroids. L. Goldman and K.W. Kitzmiller. Life Sciences 5, 2215-2224 (Dec. 1966).

An individual working in laser research was made reactive to impacts of low energy normal mode ruby laser. The energy level at the beginning of the experiments was 100 joules/sq. cm. his minimal reactive dose was found to be 38 joules/sq. cm. Partial inhibition to the delayed papular response of his laser skin reaction was done by topical applications of 0.2% and 0.025% fluocinolone acetonide, but not by 0.01% fluocinolone acetonide. Occlusive dressings with 0.01% fluocinoline acetonide, 0.4 mg. and 0.1 mg. of fluorandrenolone acetonide per 100 sq. cm. of an occlusive tape were also effective. The failure of inhibition of the petechial phase of the delayed inflam-matory response to the laser is not explained. -- J. Am. Med. Assn. References & Reviews

260 Tooth Transillumination With Laser Radiation. T. Kinersly, et al. Med. Biol. Illus. 17, 5-6 (Jan. 1967).

A low-powered ruby laser head (output 0.4 joule), an extracted tooth with a hole drilled to the crown center, and a camera were aligned on an optical bench. Exposures were made by coordinating the camera opening with the laser flash (0.5 msec. duration). Intensity of the tiny beam (1.5 mm. diameter) was sufficient to light up the entire crown. Films indicated enamel cracks difficult or impossible to detect with the naked eye. Practical applications appear possible if suggestions for piping and sealing the beam are embodied in instrument design to shield personnel.
-- J. Am. Med. Assn. References & Reviews

261 Initial Experience With and Potential of Data Processing and Computer Techniques in a Hospital Clinical Laboratory. E.R. Gabrieli, et al. Am. J. Clin. Pathol. 47, 60-68 (Jan. 1967).

Automation of laboratory data required standardization of terminology. Stored data were used to construct institutional listings and frequency distribution. The latter were used to establish the distributions of local physiological values. Each laboratory test result was transformed into a relative value which characterized the result relative to the local physiological values. The interpretation of individual assay values against the background of all physiological and patho-logical values increases the information content of the individual results. The clerical assistance offered by the computer is acknowledged, but much more importance is assigned to the new in-formation derived from the large mass of data. -- J. Am. Med. Assn. References & Reviews

SKIN DISEASES AND BURNS

262 Skin Tumorigenesis by an Extract of Amber Petrolatum. W. Lijinsky, U. Saffiotti, and P. Shubik. Toxicol. & Appl. Pharmacol. 8, 113 (Jan. 1966).

A sample of amber petrolatum has been resolved into aliphatic and aromatic fractions. The aro-matic portion was separated into two components by solvent partition. The aromatic portion and the two subfractions were tested in iso-octane solution at 50 times their concentration in the petrolatum, and all showed significant carcinogenicity to mouse skin. The petrolatum itself, tested as a 15% solution in iso-octane, showed no significant tumorigenic activity. The tumorigenic activity detected in the fractions cannot be ascribed to any of the compounds so far identified in the original sample.
-- J. Occ. Med. Absts.

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IN THE ARCHIVES November 1993

263 Ichthyosiform Dermatoses: II. Autoradiographic Studies of Epidermal Proliferation. P. Frost, G. D. Weinstein, and E. J. Van Scott. J. Invest. Dermatol. 47, 561-567 (Dec. 1966).

The major ichthyosiform dermatoses have, on the basis of clinical and cellular kinetic observations, been classified into four distinct categories: ichthyosis vulgaris, lamellar ichthyosis, epidermolytic hyperkeratosis, and psoriasiform erythroderma. The last category is considered to be a severe form of psoriasis which begins during childhood: it was not included in the present study. Transit times of epidermal cells through the epidermis were determined by injecting tritiated thymidine in vivo and then studying autoradiographs of sequential biopsy specimens. The transit time was normal in ichthyosis vulgaris (10 to 14 days) but extremely rapid in lamellar ichthyosis (4 to 5 days) and epidermolytic hyperkeratosis (4 days). The number of labeled cells per unit surface and basal lines was determined and was greatly elevated in lamellar ichthyosis and epidermolytic hyperkeratosis, but normal in ichthyosis vulgaris. Increased proliferative activity is, therefore, considered to be a significant factor leading to excess scale accumulation in lamellar ichthyosis and epidermolytic hyperkeratosis, but not in ichthyosis vulgaris.

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

264 Experiments on the Biology of Fungous Infections of the Feet. S. A. Rosenthal and R. L. Baer. J. Invest. Dermatol. 47, 568-576 (Dec. 1966).

Clinical or persistent asymptomatic fungous infections of the feet have been induced in 37% of 71 human volunteer subjects without the use of occlusive procedures following exposure. Severe trauma (blistering) immediately before exposure appeared to be an important factor in the occurrence of experimental infections of the feet since infection occurred only rarely in non-blistered sites. The clinical incubation time and the duration of the induced lesions varied widely among individual subjects. A clinical and, in some instances, also a mycologic incubation time of three months or more in some volunteers suggest the possibility that dermatophytes may exist in an altered phase. Male and female subjects were equally susceptible to experimental infection. Sites on the toe webs and on the soles were equally susceptible. No difference in pathogenicity could be demonstrated between Trycophyton rubrum and Trycophyton mentagrophytes. The infection rates in subjects exposed during the cold months—October to March—and the warm months—April to September—were not statisically different. -- J. Am. Med. Assn. References & Reviews

CHEMICAL HAZARDS

265 Activated Charcoal vs. "Universal Antidote" as an Antidote for Poisons. A. L. Picchioni, et al. Toxicol. & Appl. Pharmacol 8, 447 (May, 1966).

Results indicate that both activated charcoal and "universal antidote" are effective for adsorption of the chemical agents tested, pentobarbital, strychnine, and malathion. However, in-vitro as well as in-vivo tests demonstrated that activated charcoal alone is more effective as an adsorbent than an equivalent weight of activated charcoal present in "universal antidote." The tannic acid or magnesium oxide component of "universal antidote" apparently interferes with the adsorptive activity of the activated charcoal. Activated charcoal is recommended as a replacement for "universal antidote" in the treatment of poisoning. -- J. Occ. Med. Absts.

266 Determination of the Carboxyhaemoglobin Saturation of Blood by Spectrophotometric Analysis. J. M. Beeckmans. Brit. J. Ind. Med. 24, 71-72 (Jan. 1967).

The spectrophotometric method of Commins and Lawther (Brit. J. Ind. Med. 22, 139 (1965)) for the determination of carboxyhemoglobin saturation in blood was found to lead to systematic under valuation, because of dissociation of the carboxyhemoglobin, and physical dissolution of the carbon monoxide in the solvent used for the analysis. The theoretical relationship between the true and apparent carboxyhemoglobin saturations was calculated and was found to be in satisfactory agreement with the experimental findings, using samples of blood saturated with carbon monoxide, and aerated solvent. The error is much smaller when using oxygen-free solvent, but it is nevertheless appreciable at high carboxyhemoglobin saturations. -- Author's abst.

267 Selenium in Human Urine: A Tenative Maximum Allowable Concentration For Industrial and Rural Populations. J. R. Glover. Ann. Occ. Hyg. (London) 10, 3-14 (Jan. 1967).

The results of 1,517 estimations of selenium in the urine of exposed workers and 793 estimations of persons presenting themselves for a pre-employment examination are given. The causes of death of 17 workers who had worked with selenium are compared with their expected death rate. A maximum allowable concentration of 0.1 mg./liter of selenium in urine is recommended both for persons exposed industrially to selenium and for a rural population -- Author's abst.

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268 Carbon Monoxide Poisoning. E.R. Hughes and D.A. Fisher. J. Arkansas Med. Soc. 62, 225-260 (Dec. 1965).

Carbon monoxide poisoning is probably the most common cause of chemical death in the United States. The chemical reacts with hemoglobin to produce carbon monoxyhemoglobin, which in blood levels of 20-30% gives clinical symptoms of poisoning. The mechanism of death in carbon monoxide inhalation and intoxication is described. The exact mechanism of leukoencephalopathy of carbon monoxide poisoning is not known but it would appear that this is best explained on the basis of cerebral edema. -- APCA Absts.

269 Acute Occupational Cadmium Poisoning. A Critical Review of the Literature. B. Dunphy. J. Occ. Med. 9, 22-26 (Jan. 1967).

The history of man's occupational exposure to the fumes of cadmium extends back more than 4000 years into the antiquity of the Bronze Age. By the fourth century B.C. Aristole was able to describe in some detail the production of cadmium admixtures. Although in the mid-seventeenth century cadmium fumes were suspected of being the source of certain illnesses among foundry workers, the first detailed description of acute occupational poisoning appeared in 1858 and listed the respiratory symptoms of three men engaged in the polishing of silver with juniper and cadmium carbonate. In the United States occupational exposure to the fumes of cadmium was infrequent until after World War I, when cadmium electroplating was introduced. In 1925 animal experiments suggested the possibility of a respiratory hazard associated with acute occupational exposures. Subsequent industrial experience soon confirmed that melting cadmium or cadmium compounds without adequate ventilation was an extreme occupational hazard. Consideration of the circumstances and events surrounding cases of acute occupational cadmium poisoning reported in the literature reveals that three factors are common to most of them. First, the presence of cadmium in some particular alloy or on the surface of some other metal is unsuspected. Second, some physical or chemical process (i.e. heating, spraying, brazing), capable of generating high concentrations of particles smaller than 10 microns in diameter, is in use. Third, sufficient ventilatory protective measures are not provided. Preventive measures must be directed primarily at the third factor if cadmium poisoning is to be eliminated. There are 20 references.

270 Observations on the Excretion Rate and Concentration of Mercury in Urine. M.K.B. Molyneux. Ann. Occ. Hyg. (London) 9, 95-102 (July, 1966).

In the case of industrial exposure to inorganic mercury vapor the estimation of mercury in urine may be used to identify the individual with increased and excessive mercury absorption. A study was directed toward this biological index of exposure in order to establish a control for the hazard of mercury. Evidence is presented that mercury is excreted rhythmically, as a result of some physiological mechanism rather than the direct effect of immediate environmental exposure. -- APCA Absts.

271 Mercury Poisoning and Its Treatment With N-acetyl-D, L-Penicillamine. V. Parameshvara. Brit. J. Ind. Med. 24, 73-76 (Jan. 1967).

Two cases of chronic inorganic mercury poisoning of moderately rapid onset are described. Although exposure was the same in the two patients, the mercurial poisoning affected chiefly the kidneys in one and the gums in the other. Mercurialentis and corneal opacities were seen after short exposure to the metal. One case was treated successfully with N-acetyl-D, L-penicillamine. No toxic effects were observed and this is suggested as the treatment of choice for mercury poisoning. -- Author's abst.

272 An Inorganic Mercury Hazard in the Manufacture of Artificial Jewelry. J.F. Copplestone and D.A. McArthur. Brit. J. Ind. Med. 24, 77-80 (Jan. 1967).

An unusual inorganic mercury hazard in a factory manufacturing artificial jewelry is described. Considerable exposure of workers was confirmed by levels of up to 2,000 micrograms/liter of mercury in urine. The air concentration was also found to be correspondingly high, up to 0.5 mg./cu.m. of mercury in the general atmosphere. Preventive measures have resulted in a slow fall in urinary concentrations over a period of several months. Despite the high results obtained, no worker showed any overt evidence of mercurialism. The significance of this is considered in the discussion and it is suggested that mercurialism may be due to a failure in excretion. If this is so, it would have a considerable effect on surveillance techniques; furthermore such a hypothesis may account for the anomalies that are well known in the surveillance of workers exposed to mercury. -- Authors' abst.

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IN THE ARMS November 1966

273 Lead Retention by the Lungs of Lead-Exposed Workers. S. Mehani.
Ann. Occ. Hyg. (London) 9, 165-171 (July, 1966).

A study has been made of the retention of lead dust and fume by the lungs of 51 lead workers, 22 shipburners, and 25 control subjects. It was found that 39-47% by weight of the inspired lead is retained in the lungs of lead-exposed workers, and in this group, the average ventilation under various working conditions is approximately 10 cu. m. /8 hour shift. It is concluded that at an atmospheric concentration of lead of 2 mg. /10 cu. m. of air, the working conditions are within safe limits, as the amount of lead retained per shift is less than 1/2 the amount which can be tolerated by man without producing evidence of ill-health. It was also found that the degree of lead retention was not associated with the depth of breathing. The present findings, and those of previous authors, and the various factors which affect dust retention have been discussed.
-- APCA Absts.

274 Renal Failure Due to Carbon Tetrachloride. Ann Arbor Case Reports. T.N. Markham.
J. Occ. Med. 9, 16-17 (Jan. 1967).

The case presented here appears to follow the general pattern usually seen in carbon tetrachloride poisoning involving renal failure. The exposure is frequently minimal and the patient frequently has been in good general health. He usually has a history of significant ethanol intake, generally over a prolonged period. The over-all prognosis in these cases appears to be 80-90% recovery when artificial dialysis is used. Death in nearly all cases is a result of the renal failure and not liver injury. There are five references. -- Cond. from author's comment

275 Liver Disease Secondary to Tetrachloroethylene Exposure. L.C. Meckler and D.K. Phelps.
J. Am. Med. Assn. 197, 662-663 (Aug. 22, 1966).

This paper reports on a case of hepatitis in the acute state, caused by the inhalation of tetrachloroethylene fumes in a dry-cleaning establishment. The amount of inhaled tetrachloroethylene was assumed to be substantial enough, especially the higher concentration on the patient's last day of work, to produce the characteristic picture of an acute stage of hepatitis. There are nine references. -- Public Health Eng. Absts.

276 Acute Benzene Poisoning. J. Drozd and E. J. Bockowski.
J. Occ. Med. 9, 9-11 (Jan. 1967).

The circumstances of exposure in a case of an acute benzene poisoning are presented, including evaluation of benzene concentrations at the location where the exposure occurred, urine—sulfate ratios of the patient and other exposed workers, and the symptoms and laboratory findings of the patient. The low-threshold limit value of 25 ppm for benzene indicates that adequate ventilation should be a primary concern for users of this solvent—preferably a less toxic solvent be substituted. Personnel having occasion to work with benzene should be informed of the toxicity and flammability of the vapor. Detailed instructions for safe handling and use of benzene are given in the Chemical Safety Data Sheet SD-2, the American Petroleum Institute's review on benzene, and the Shell Chemical Company's Industrial Hygiene Bulletin. Eight references are given.
-- Authors' summary

277 Adverse Reactions to Sulfobromophthalein Sodium. R.I. Wang and J. Jacobson.
Am. J. Digest. Diseases 11, 973-976 (Dec. 1966).

In view of the fact that eight fatal reactions to sulfobromophthalein sodium (BSP) have been reported in the literature, vigilance must be maintained whenever BSP is administered. Three new cases of adverse reactions to BSP are presented. The allergic history of the patient and his response to previous administration of BSP should be obtained in order to avoid BSP reaction. BSP should be administered slowly to avoid thrombophlebitis, and other precautionary measures, before, during, and after BSP injection, should be observed.
-- J. Am. Med. Assn. References & Reviews

278 Further Investigations on the Evaluation of Exposure to Nitrobenzene. J. Piotrowski.
Brit. J. Ind. Med. 24, 60-65 (Jan. 1967).

Metabolic studies were performed on men exposed to nitrobenzene vapor under experimental conditions. Absorption was estimated by the analysis of urine for p-nitrophenol. About half as much vapor was absorbed through the skin as through the lungs. In inhalation studies the accumulation of nitrobenzene in the course of repeated exposures was investigated. It was found that

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p-nitrophenol was excreted in the urine in increasing amounts on successive days of exposure, reaching, by the end of a week, levels approximately two and a half times as high as on the first day. The specificity of the p-nitrophenol test on urine was studied using rats. Of all nitro-compounds investigated only chloronitrobenzenes, especially the ortho-isomer, gave interfering compounds in the urine. o-Chloronitrobenzene gave lower results than nitrobenzene by a factor of three. -- Author s abst.

279 Dieldrin Persistence in Cranberry Bogs. C.W. Miller.
J. Econ. Entomol. 59, 905-906 (Aug. 1966).

Although large volumes of water were applied to the area, dieldrin remained localized in the upper four inches of the soil profile. Lack of vertical and lateral movement to any great extent is attributed to the relatively high organic content of the soils. Six references are given.
-- Public Health Eng. Abst.

INDUSTRIAL DUSTS

280 A Note on Reliability of Membrane Filter Dust Sample Evaluation by Microscope Counting.
A. Sniegowski. Ann. Occ. Hyg. (London) 9, 65-67 (April, 1966).

A study has been made of the statistical error associated with the counting of respirable dust particles collected on a membrane filter. The error is shown to be higher than predicted by Poisson's Law. -- APCA Absts.

281 Electrostatic Precipitators in Thermal Power Stations Which Use Low Grade Coal.
H.L. Engelbrecht. Air Eng. 8, 20-25 (Aug. 1966).

The requisite size of a precipitator ultimately depends solely on the migration velocity of the dust particles (cm./sec.). Because this value cannot be calculated accurately in advance, the precise dimensional design of an electrostatic precipitator remains largely a matter of experience.
-- Public Health Eng. Absts.

282 Effects of Histamine Aerosol in Byssinotic Subjects. A.A. E. Massoud, et al.
Brit. J. Ind. Med. 24, 38-40 (Jan. 1967).

The changes in symptoms and lung function tests of 26 cotton cardroom workers were investigated before and after inhalation of histamine aerosols. Three subjects with no chest symptoms and 11 with uncomplicated byssinosis showed no evidence of any pulmonary reaction, but 12 bronchitic byssinotic subjects showed evidence of the pulmonary hypersensitivity found in patients with chronic bronchitis alone. These findings cast doubt on the possible role of nonantigenic histamine liberators in the mechanism of production of "return-to-work" tightness in byssinosis.
-- Authors' abst.

283 Post Mortem Studies of Deceased New South Wales Coal Miners. K.G. Outhred and H.I. McKenzie.
Joint Coal Board (Sydney, Australia), various paging, mimeographed, (Sept. 1966).

This report covers the results of examination of the lung specimens and medical and occupational histories from 504 deceased coal miners. Information is presented on (1) causes and modes of death in relation to age at death and mining district; (2) prevalence of pneumoconiosis in various degrees, analysis of origin by district mine and seam, and severity in relation to years of exposure; (3) prevalence of emphysema; and (4) relationship of chronic obstructive bronchitis to age and exposure. There is an association between history of chronic obstructive bronchitis, employment at the coal face and the finding of coal dust in the lungs at autopsy.
NOTE: In a cover letter, Dr. Glick, Chief Medical Officer of Joint Coal Board, has indicated that much of the data in this study was collected before their medical scheme became effective. The authors propose a more extensive assessment of bronchitis post mortem in future studies, as well as an evaluation of such important aspects of personal history as smoking habits, which were not included in this study. -- PG

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284 Experiments on the Elimination of Dust From Human Lungs. H. J. Einbrodt. Ann. Occ. Hyg. (London) 10, 47-49 (Jan. 1967).

The dust content of the individual lung lobes of two groups of miners was determined with formamide. The first group consisted of lungs from victims of a mine disaster; the second included lungs of retired miners who were not exposed to heavy dust loads for at least 10 years prior to their deaths. Incomparison, the latter group exhibited less dust content, implying a self-cleansing over a period of no dust exposure. -- Author's abst.

285 The Association of Progressive Systemic Sclerosis (Scleroderma) With Coal Miners' Pneumoconiosis and Other Forms of Silicosis. G. P. Rodnan, et al. Ann. Internal Med. 66, 323-334 (Feb. 1967).

Twenty-six of 60 consecutive men with progressive systemic sclerosis were found to have been coal miners or to have been engaged for long periods of time in other occupations in which there was prolonged and heavy exposure to silicious dusts. With the exception of more frequent respiratory complaints the mode of onset, the severity, and the course of the progressive systemic sclerosis did not differ significantly from what was observed in the authors' patients as a whole. There was roentgenographic evidence of silicosis in eight cases, and in three others nodular anthracosilicosis of the lungs and the tracheal lymph nodes was found at necropsy. There is evidence that indicates that the prevalence of progressive systemic sclerosis among coal miners and other men engaged in similar dusty trades is higher than that in the general population, and it is suggested that silicosis may be a predisposing factor in the pathogenesis of this disease. There are 36 references. -- Authors' summary

286 Immunological Reactions and Pulmonary Dust Disease. B. Pernis. Ann. Occ. Hyg. (London) 9, 49-57 (April, 1966).

An immuno-histochemical study of Caplan nodes supports previous assumptions that this node is essentially a rheumatoid nodule in the lung, and is the same lesion as the subcutaneous rheumatoid lesion, only it has been localized in the lung by reason of dust. In the area of pneumoconiosis, there is evidence that immunological reactions are playing a role, but the specificity of the antigens and antibodies involved are not known. The relevance of immune reactions to the development of the lesions, and ultimately to the development of an invalidating disease is also not clear. -- APCA Absts.

287 Silica Excretion in Relation to the Chemotherapy of Silicosis. T. G. Morris, P. J. Patterson, and J. Marks. Ann. Occ. Hyg. (London) 9, 69-71 (April, 1966).

Recent research promises the hope of effective chemotherapy for silicosis but means for its assessment during treatment have been lacking. It is suggested that agents which depress the toxicity of silica will reduce its solubility and this will be reflected in the amount of silica excreted. Experimental observations and different aluminum compounds show, for example, that aluminum-dextran, which offers considerable protection against the effects of silica also greatly reduced its excretion, while the aluminum-EDTA chelate, which has little protective action does not. -- APCA Absts.

288 Asbestos Dust and Its Measurement. C. G. Addingley. Ann. Occ. Hyg. (London) 9, 73-82 (April, 1966).

The nature of asbestos dust and the testing requirements are discussed. Existing standard methods are briefly reviewed. The development of a membrane filter method of dust counting for asbestos is described in detail. It is thought to be an improvement on existing methods. Tyndallometric methods are considered, and a description of the application of the "Royco" Particle Counter, an instrument based on this principle, to factory testing is described. It is believed that this instrument represents a big advance in routine test methods. -- APCA Absts.

289 Environmental Investigation of a Plant for the Production of Synthetic Detergent and Abrasive Soap. M. S. Abdel Salam, et al. Ann. Occ. Hyg. (London) 10, 51-56 (Jan. 1967).

Dust exposures in a synthetic detergent and abrasive soap factory were studied. High concentrations of respirable dusts were found. Cases of silicosis and silicotuberculosis were found among the workers. No practical method could be thought of to decrease the silica-containing dust in the abrasive soap department with the existing layout of the machinery. The production of abrasive soap had to be stopped. A closed system, with effective dust control devices, is now being designed. Proper ventilation of the plant for synthetic detergent was suggested. -- Authors' abst.

03122464

PHYSICAL ASPECTS OF THE ENVIRONMENT

290 Hearing and Infectious, Tropical and Nutritional Diseases. Y. P. Kapur. Laryngoscope 76, 418-457 (1966).

A pool of 1,000 normal-hearing (less than 30 db. loss at any frequency between 500 and 6,000 cps) children was established by screening audiometry. When any of these children contracted mumps or developed vitamin B deficiency, they were given complete audiograms during and 6-12 weeks after the illness. During the first two years of the study, 20 children developed vitamin B deficiency; of these 20, seven showed a persistent conductive loss (30 db. or greater hearing levels). Of the 14 who developed mumps, two showed a similar conductive loss. Some data on the hearing of people with other diseases (prior auditory status unknown) are also presented. During the acute stages of typhoid fever and chickenpox, the incidence of conductive deficit is very high in India (50% and 20%, respectively), but this loss disappears upon recovery from the illness. In smallpox, on the other hand, the conductive losses observed in 25% of the 47 patients apparently persisted at least six weeks. Sensorineural losses were negligible in all aspects of the studies.

-- J. Occ. Med. Absts.

291 Noise: An Occupational Hazard and Public Nuisance. A. Bell. World Health Organization, Public Health Papers 30, 131 pages. (1966).

After describing the medical aspects of hearing, the operation of hearing-conservation programs, and the engineering control of noise, the author discusses the assessment of disability, legislation in different countries, and the problems of community noise. Throughout the text, reference is made to many original papers and works on the subject. There are 310 references

-- Public Health Eng. Absts.

292 A Noise-Attenuating Enclosure for Audiometer Earphones. R. R. A. Coles. Brit. J. Ind. Med. 24, 41-51 (Jan. 1967).

Noise-excluding earphones may be subdivided into circumaural earphones and noise-attenuating earphone enclosures. Two versions of "Otocups," an example of the latter subdivision, were evaluated in a series of experiments and in comparison with a conventional type of earphone (Telephonics TDH-39 receiver in a MX-41/AR cushion). The experiments involved a comparison of auditory threshold, artificial ear measurements, test-retest reliability, and pure-tone attenuation. The second version of "Otocups" was considered sufficiently reliable for most purposes and to have practical applications in industrial and clinical audiometry when proper booths are not possible on account of cost, weight, or space factors. -- Author's abst.

RADIOACTIVITY AND X-RADIATION

293 The Radiant Energy Received by Patients in Diagnostic X-Ray Practice. R. H. Morgan and Judith C. Gehret. Am. J. Roentgenol. Radium Therapy Nuclear Med. 97, 793-810 (July, 1966).

Data from a study of the radiant energy projected on and received by 36,000 patients at the Johns Hopkins Hospital appear to be useful in evaluating levels of unnecessary exposure prevailing in diagnostic radiology, in estimating annual genetic dose due to diagnostic x-ray methods, and in evaluating trends in this dose arising from an increased application of x-rays in medical practice and from the institution of techniques to reduce patient exposure. There are 11 references.

-- Public Health Eng. Absts.

294 High Energy Electron Injury From Accelerator Machines (Cathode Rays): Radiation Burns of Chest Wall and Neck: 17-Year Follow-Up of Atomic Burns. J. B. Brown and M. D. Fryer. Ann. Surg. 162, 426 (Sept. 1966).

A brief summary and photographs of the injury and treatment of four patients following accidental exposure to cathode rays of high-energy electron accelerators show that resection and skin grafting can result in functionally adequate skin surfaces. The development of these degenerative burns is uneven in time, extent, and location on the body because of the wide dispersion of the rays. Accelerated electrons in the range of one to a few million electron volts are particularly hazardous because of their ability to pentetrate surface tissues. It is necessary to recognize the delayed breakdown of irradiated areas so that repair with grafts or flaps is done while as much tissue as possible may be saved. Tissue breakdown may continue up to four years or more. Pathologic

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studies of the skin show typical changes of chronic radiation dermatitis in these cases. Radiation lesions of the chest, especially from deep radiotherapy, may be complicated by involvement of pleura, pericardium, lung or heart. A brief follow-up report on the radiation burns of the hands suffered by four workers at the Eniwetok tests in 1948 shows the continued preservation of hand function as the result of surgical resection and repair with thick, split-skin grafts.

-- J. Occ. Med. Absts.

ENVIRONMENTAL MEASUREMENTS

295 Observations From a 26-Year Sulfur Dioxide Area Survey. M. Corn, D. H. Thompson, W. J. Schreibeis and R. T. P. deTreville.
Arch. Environmental Health 12, 445-451 (April, 1966).

The authors have described a sampling program which was faithfully carried out over a 26-year period to determine if the sulfur dioxide concentration in the air basin surrounding plant operations changed significantly as industrial plant capacities and the resident population of the area increased. A total of 13,751 air samples were collected by a consistent technique at 42 sampling stations in Beaver County, Pa., and were analyzed by one method for sulfur dioxide. The sulfur dioxide concentrations determined in this program were subjected to statistical analysis after punching all appropriate data for each sample on an IBM card. The data revealed the following information: It was not possible to discern a yearly trend demonstrating improvement or deterioration of air quality with respect to sulfur dioxide over the 26 years. Only 0.5% of the samples obtained during a four-minute sampling period were associated with sulfur dioxide concentrations of 0.3 ppm or above. A sulfur dioxide concentration of 0.3 ppm for eight hours may cause damage to vegetation and represents an "adverse" condition in the California Standards for Ambient Air. Sulfur dioxide concentrations were higher during winter months than during summer months, suggesting the effects produced by changes in residential space heating demands. Sulfur dioxide concentrations were higher during the 5:00 AM to 12:59 PM time interval than during the remaining hours of the day. This result suggested the presence of periods of atmospheric stagnation and increased space heating during this period. Sulfur dioxide concentrations were higher at stations downwind from the reference point but were highest during periods of calm, suggesting the great influence of atmospheric inversions. The air sampling program described here was initiated and sponsored by an industry interested in the quality of the air basin in which it functions. In the opinion of the authors, this study should serve as a model, not necessarily in specific methodology used, but as a relatively inexpensive approach by industry to ensure that air quality in the vicinity of plant operations does not deteriorate. There are 15 references.

-- Cond. from authors' summary

296 Toxic Constituents of Welding Fumes. J. Steel and J. T. Sanderson.
Ann. Occ. Hyg. (London) 9, 103-111 (July, 1966).

Although the main constituents of electrode coatings are known, little information exists on toxic substances present as impurities, and even less on their concentrations in arc welding fumes. In this investigation, spectrographic, and chemical analyses of the coatings of a number of electrodes in common use have been carried out. The same electrodes have also been subjected to standard welding tests and the concentrations of toxic substances in the respirable atmosphere have been measured. The results reveal that current methods for assessing welding fume hazards, based on iron oxide or total fume concentration are unacceptable. -- APCA Absts.

297 A Chemiluminescence Method for Determining Ozone. D. Bersis and E. Vassiliou.
Analyst 91, 499-505 (Aug. 1966).

A method for determining ozone is described which is characterized by the direct recording and automatic determination of ozone within a wide range of concentrations. The development of the method is based on the use of a chemiluminescent solution that is stable and shows a linear relationship between the light emitted and ozone concentration. The electronic instrumentation used is simple and other methods of ozone analysis based on this principle meet difficulties, because of the direct oxidation of the chemiluminescent compound. The present method, by contrast, involves the use of gallic acid as an ozone acceptor, and rhodamine B, which remains unchanged during the measurement as a photon emitter. Observations made with an oscillograph of the light emitted by single bubbles of ozonized air passing through the chemiluminescent solution gave valuable information about the response time of the system.

-- APCA Absts. modified

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298 Organochlorine Pesticides in the Atmosphere. D.C. Abbott, et al. Nature 211, 259-261 (July 16, 1966).

Experiments were carried out to ascertain the extent to which organochlorine compounds are present in the atmosphere. It was found that the concentrations of these residues are so low that it was necessary to work almost at the limit of sensitivity of the detection systems. There are 13 references. -- Public Health Eng. Absts.

299 The Dosage of Quartz in Air Samples Taken in the Foundry. M. Martin and R. Paton. Fonderie 243, 179-182 (May, 1966). (French).

The dosage of quartz contained in fine dusts in suspension in the air, is an essential factor in studying the atmosphere in foundries. The dosage methods usually employed are numerous: methods of chemical attack, indirect colorimetric micro-method, physical and physico-chemical methods. Among the latter, the diffraction method by x-rays is of interest for determinations in series. The Technical Center has developed a simple process which applies to this method. In principle, it consists of comparing the intensities of the diffraction line of a sample with a range of intensities obtained on standards. Hundreds of dosages have been made using this technique over two years. This process may be considered sufficiently precise for evaluating the risk of silicosis. -- APCA Absts.

PREVENTIVE ENGINEERING

300 SAF-HANS—A Positive Means to Improve Safety. E.J. Ferguson and J.M. Daschbach. J. Am. Soc. Safety Eng. 12, 14-17 (Feb. 1967).

Safety program effectiveness under present standards is measured in terms of reduced accident frequency or severity. This measurement depends on a response time that is quite long and in the meantime other parameters such as weather, holidays, etc. may bias the results. An investigation of the hazards frequency reduces the effect of these other parameters and gives a better evaluation of safety program effectiveness. An important corollary to the photographic studies concerns the inherent hazards created in the plant facilities by the architect, engineer, or planner. In several photograph sequences, the hazards caused by parts of the building, placement of conveyor systems, and other elements of plant layout were quite evident. This means of establishing safety criteria is feasible and economical enough for small industrial concerns who are concerned enough about their safety records to make positive efforts to improve them. Safety research is normally oriented to making the equipment safer through mechanical means. However, just as defensive driving of an automobile has proven to be an effective means to prevent accidents so hazard frequency reduction can effectively reduce accident rates. The Safety through Frequency of Hazards Analysis (SAF-HANS) procedure is one way to analyze these hazards.
-- Authors' conclusion

301 Heat-Protective Ventilated Jackets: A Comparison of Humid and Dry Ventilating Air. G.W. Crockford and D.E. Lee. Brit. J. Ind. Med. 24, 52-59 (Jan. 1967).

A comparison has been made between humid and dry air for ventilating a heat-protective jacket. At sensible cooling capacities of 4.5 kcal./min. and above, humid and dry air provided equal protection. At sensible cooling capacities of 4 kcal./min. and above, the subject achieved thermal equilibrium within 65 minutes with both humid and dry air, but below this value humid ventilating air is associated with elevated sweat rates and a failure to achieve thermal equilibrium within 65 minutes. -- Authors' abst.

302 Allergies and Air Conditioning. S.M. Feinburg. Am. J. Nursing 66, 1333-1336 (June, 1966).

Air conditioning, natural or mechanical, can offer special benefit to persons who have asthma and hay fever if the cause of the condition is determined to be an inhaled allergen and if the proper equipment is selected. -- APCA Absts.

303 Replacement of Quartz Sand in Pneumatic Operations by Mineral Blasting Media That Do Not Cause Silicosis. W. Gesell. Stahl Eisen 86, 906-912 (July 14, 1966).

Measures adopted in various countries to prevent silicosis among personnel engaged in blasting operations using quartz sand are described. Laboratory and practical blasting tests with various media such as blast-furnace, Renn, and copper slags, basalt, ferro-chrome slag and corundum are given. Determination of the various characteristics of the media, including removal rate, specific blasting time, and the specific media consumption rates were investigated. Results of blasting tests on bridges are shown as well as profitability aspects of the various media.
-- APCA Absts.

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IN THE AIR (1966) November

304 Procedure for the Dry Separation of Sulfur Dioxide From Waste Gases. H. Juntgen.
Chem. Ingr. Tech. 38, 734-736 (July, 1966).

In the dry processes for separating sulfur dioxide from waste gases, the sulfur dioxide is bound by adsorption onto carbon-containing substances, or chemically by reacting with metallic oxides or carbonates in the presence of oxygen to form sulfates. The regeneration of the sulfates involves a considerable outlay and usually proceeds via various intermediate stages, whereas the sulfur dioxide can be removed relatively simply from carbon-containing adsorbents either by washing out with water or by applying heat. -- APCA Absts.

305 Utilizing Solvent Refined Coal in Power Plants. R.M. Jimeson.
Chem. Eng. Progr. 62, 53-60 (Oct. 1966).

The economic aspects of the process and the cost of reducing air pollution from power plants by the substitution of clean solvent refined coal for conventional contaminated fuels are estimated. The emission of oxides of sulfur from power plant stacks is a major source of air pollution in the U.S. There are three approaches to the solution of the problem, the oxides of sulfur can be removed from the stack gases, power plants can resort to the burning of fuels with a low sulfur content, and the power industry may adopt new clean power cycles as they become available.
-- APCA Absts.

306 Economics of Coal Desulfurization. R.E. Zimmerman.
Chem. Engr. Progr. 62, 61-66 (Oct. 1966).

The object of coal preparation processess for desulfurization of coal is the removal of pyritic sulfur. To determine the extent of pyritic sulfur reduction possible for different coals, tests are made showing the effect of various degrees of crushing and pulverization. Microscopic examinations can be made to show the degree of liberation. This article reviews the modern coal preparation practices and discusses the uses and limitations for desulfurizing coal. --APCA Absts.

307 Removing Sulfur Dioxide From Flue Gases. S. Katell.
Chem. Eng. Progr. 62, 67-73 (Oct. 1966).

The removal of sulfur from coal prior to its utilization as a power plant fuel is investigated. An economic evaluation of new methods for removing sulfur dioxide from power plant flue gases is presented. Processes under development or proposed for development in the U.S. are considered. Estimated capital investment and operating costs for three dry processes for removing sulfur dioxide from flue gases are projected for an 800-Mw. power plant burning 3% sulfur coal.
-- APCA Absts.

COMMUNITY AIR HYGIENE

308 Economic Effects of Air Pollution. E.M. Parrish.
District Heating 51, 93-94, 112 (Jan. 1966).

There are over 6,000 communities in the U.S. which are faced, to some degree, with air pollution problems. What any one community can and will do depends on the collective judgment of its citizens in evaluating the cost of permitting air pollution as compared with the cost of eliminating it. In both instances, the dollar cost is difficult to evaluate because air pollution is mixed with environment, and judgment often tends to be influenced by the people's feelings and emotions rather than facts. The cost of air pollution in the continental U.S. is estimated to be in excess of 6 billion dollars a year. This is the cost of permitting and tolerating air pollution—not the cost of abatement, enforcement, research, or personal suffering. Six billion is the loss of property or property values and the increased burden of maintenance and premature replacement. This does not include the cost of medication or medical treatment for relieving the inconvenience, discomfort, or illness attributed to air pollution, nor how these effects are reflected in corporate operating costs in high absenteeism, sick pay, insurance costs, and substandard production. These expenses are in addition to the injury, damage, and destruction of property and personal possessions.
-- APCA Absts.

309 Comparative Method for Studying Costs of Air Pollution. I. Michelson and B. Tourin.
Public Health Repts. 81, 505-511 (June, 1966).

Previous estimates of the economic effects of air pollution have been vague and uncertain. A study was performed in the Upper Ohio River Valley in 1960 in order to establish more firmly cost figures of air pollution. Although the project must be considered as a pilot study, the conceptual

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framework, design, execution, and the results of the study are presented. The methodology of the study is emphasized in order to allow persons interested in pursuing such studies to profit by this example. -- APCA Absts.

310 Atmospheric Pollen in Amherst, Mass. M. L Allessio and J.R. Rowley.
Botan. Gaz. 127, 35-40 (March, 1966).

Records of airborne pollen grains and spores from two collection sites show the influence of the immediate vegetation. A larger number of pollen grains but fewer spores were recorded from slides exposed atop an unobstructed building than from those exposed near ground level 500 meters away on a forested hillside. Some of the differences between the two sites could be explained by the proximity of the plant genera to the site having the higher number. Almost all genera were recorded at both stations, and recovery at both sites was generally parallel in time. Because of the qualitative similarities in the genera recorded at each site and the general uniformity of the local and regional floras, it was not possible to determine whether the data reflected local or regional vegetation. No record was obtained, however, that could not have been produced by the local vegetation. -- APCA Absts.

311 Industry Action to Combat Pollution. J. J. Hanks and H. D. Kube.
Harvard Business Rev. 44 (5) 49-62 (1966).

Private enterprise has the opportunity to participate in a market that will total at least $275 billion over the next 34 years, and to ensure the availability of clean air and clean water. Industry and motor vehicles are responsible for a large portion of air and water pollution. Air and water pollution, solid wastes, container and other problems, and possible solutions are discussed. -- APCA Absts.

312 Basic Air Pollution Control Equipment. Anonymous.
Safety Maint. 132, 38-41 (Aug. 1966).

The basic types of air contaminants are defined. Diagrams are shown for a filter (cloth tube) collector, a cyclone dust collector, a wet scrubber dust collector, and an electrostatic precipitator. The principle and mode of operation for each type of system is discussed. -- APCA Absts.

313 Air Pollution. A New Response to an Old Problem. V.G. Mackenzie.
Can. J. Public Health 57, 65-70 (Feb. 1966).

Several provisions of the Clean Air Act and the activities being carried out under them are discussed. Developments of new controls in such areas as sulfur dioxide control, solid waste disposal, and automobile exhaust emissions are described. New legislative proposals now pending before Congress to amend the Clean Air Act are held as an indication of the influence of rising national concern for air pollution and an indication of greater scientific awareness and public understanding of the problem. -- APCA Absts.

314 New York City's Tough New Air Pollution Bill, and What It May Mean to You. S. Elonka.
Power 110, 71-73 (Aug. 1966).

The new ordinance prohibits the burning of soft coal for heating purposes and bans the installation of incinerators in new buildings. The sulfur content of fuel burned must be reduced to 2.2% by January 20, 1967 and to 1% by May 20, 1971. -- Public Health Eng. Absts.

MANAGEMENT ASPECTS

315 A Method of Handling Partial Disability Placement Problems. J. Rheinheimer.
J. Am. Soc. Safety Eng. 12, 9-12 (Feb. 1967).

Objective placement of partially disabled employees to available jobs is a difficult task at best, but it can be minimized by the presence of a pre-arranged method for handling such problems. Although the employee or his employer have the most to lose in the process, both are heavily dependent upon information furnished by an outside source— medical opinion. The examining physician's findings cannot be of specific value to the disability placement procedure until it is compared with the physical demands of the job that needs to be done. -- Cond. from author's summary

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