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Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL

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INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE ·· PITTSBURGH, PA. 15213

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IN RE: AIRLINES
November 1992

INDUSTRIAL HYGIENE FEATURES

Abst. No. 1042 surveys the dispersion of aerosols in hospitals utilizing aerosol inhalation therapy.

The maximum acceptable weight of lift is discussed in Abst. No. 1046.

Abst. No. 1052 is concerned with acute leukemia and infection.

Absts. No. 1053 and 1054 investigate gastroenteritis from an orange juice preparation.

The effect of cigarette, cigar, and pipe smoking on nicotine excretion is studied in Abst. No. 1058.

Abst. No. 1060 describes a case of pigeon breeder's lung.

Abst. No. 1062 discusses the pulmonary reactions to toxic gases.

See Abst. No. 1063 for a report on copperhead bites in the U.S.

Details on the prevalence of epoxy resin dermatitis are given in Abst. No. 1064.

Abst. No. 1070 presents data on carbon monoxide control in a high highway tunnel.

Abst. No. 1074 studies the aspects of zinc phosphide poisoning.

Abst. No. 1077 presents an international study of "normal" levels of lead in blood and urine.

Cancer-promoting effects of phenols in tea is the topic of Abst. No. 1088.

Experimental silicosis. The "atypical" reaction in the Syrian hamster, is the title of Abst. No. 1089.

Abst. No. 1103 reviews industry and the pollution problem.

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FOUNDATION FACTS

STAFF ACTIVITIES: Dr. Paul Gross, Director of IHF Research Laboratory and member of the American Conference of Governmental Industrial Hygienists' Threshold Limits Committee, attended a meeting of the Committee on November 13-14 in Cincinnati, Ohio. Dr. Gross spoke on "Ferruginous Bodies" during a session on Disease Related to Asbestos in Man—Epidemiology at the Second Antigua Conference sponsored by the Quebec Asbestos Mining Association on November 20-23 in the British West Indies. (A brief report on the first such meeting appeared in the Foundation's Medical Series Bulletin No. 11, "Asbestos Bioeffects Research for Industry.") On November 29, Dr. Robert T. P. deTreville, IHF Managing Director, will talk to the American Iron and Steel Institute Industrial Hygiene Committee in New York on IHF programs to assist setting of standards—ACGIH threshold limit values and USA Standards Institute maximum allowable concentrations.

ENGINEERING DISCUSSIONAL: Programs for the Fourth Engineering Discussional on The Control of Environmental Health Hazards to be held January 9-11, 1968 at Holiday Motor Inn (Sewickley) have been mailed to all member companies. Sponsored by the Engineering Committee, the Discussional is for representatives of member companies only for the purpose of bringing together, on a common meeting ground, Foundation members primarily concerned with the engineering control of the industrial environment.

FOREIGN VISITORS: Mr. Chin-yuan Chuang, Sanitary Engineer and Chief of the Second Section of the Municipal Department of Public Health in Taipei, Taiwan, visited Dr. deTreville and toured Mellon Institute on November 14.

NEW REPRINT AVAILABLE UPON REQUEST: "The Pulmonary Reactions to Toxic Gases," Paul Gross, William E. Rinehart and Robert T. P. deTreville. AIHA Journal 28: 315-321 (July-August, 1967).

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INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

- 1018 Bulletin of Courses July 1967 Through June 1968. Training Program National Center for Air Pollution Control, U.S. Department of Health Education & Welfare, Public Health Service, Bureau of Disease Prevention and Environmental Control.

Courses are given for scientists, engineers, and other professional people in the field of air pollution control, and related activities. They provide effective means of consideration and appraisal of the newest developments in the subject areas, with opportunity for practice in the application of the latest techniques. Training is given in lectures supplemented by visual aids and closed-circuit television, demonstrations, problem sessions, and panel discussions. Laboratory and field practice, where applicable, give opportunity to acquire proficiency in the new techniques under the guidance of experts. Full trainee participation is encouraged and, in fact, is scheduled as an important part of each course. No tuition or registration fee is charged. Further information may be obtained by writing to: Chief, Training Program, National Center for Air Pollution Control, 4676 Columbia Parkway, Cincinnati, Ohio 45226.

- 1019 Handbook of Noise Measurement.

The new sixth edition of the popular Handbook of Noise Measurement, by Arnold P. G. Peterson and Ervin B. Gross, is the largest, most extensively revised edition in the book's 15-year history. Many sections have been revised for greater convenience and to reflect the latest techniques in this fast-moving field. The material in the book has been rearranged by application areas and cross-indexed for excellent accessibility. The handbook includes a detailed discussion of noise and vibration, including definitions, characteristics, measuring units, and psychological and physiological effects of noise on humans and their activities. A new section describes noise-measuring instruments and accessories fully, with particular attention to the instrumentation needed to analyze specific noise problems. Step-by-step noise-measuring techniques are also covered. A particularly useful chapter is devoted to noise and vibration control with a number of case histories. The expanded reference section includes many new charts and tables, a bibliography of references on sound and vibration, and an up-to-date catalog of General Radio sound instruments. The Handbook of Noise Measurement is available for \$1.00 from General Radio Company, West Concord, Massachusetts. 01781.

-- Am. Ind. Hyg. Assn. J. 28, 329 (July-Aug. 1967).

- 1020 Audiometry Publications.

Employers Insurance of Wausau has published and is making available two booklets on noise and audiometry. The booklets, entitled Industrial Noise and Hearing Protection and Guide for Industrial Audiometric Technicians, describe the physics of sound, the anatomy and physiology of the ear, and the proper operation of the audiometer. Also explained are means to a successful hearing conservation program in industry, beginning with correct procedures in the conduct of a hearing examination. The booklets were prepared in collaboration with a large number of qualified individuals and organizations. Copies may be obtained free of charge by writing to Dr. Roger Maas, Employers Insurance of Wausau, Wausau, Wisconsin.

-- Am. Ind. Hyg. Assn. J. 28, 334 (July-Aug. 1967).

- 1021 Have a Heart.

Heart and circulation diseases are listed as the third highest handicapping illness in the U.S.A. Heart disease scares the victim, but in some cases, it frightens the boss even more! If you are wondering just how much of a problem it is to hire a heart case, a new booklet will be of interest—Workmen's Compensation and the Cardiac. It shows how labor, management, and the medical profession cooperate to employ and rehabilitate cardiac patients. It is available from the Chicago Heart Association, 22 West Madison St., Chicago, Illinois 60602.

-- Natl. Safety News 26, 23 (Oct. 1967).

1022 Doctorate Program in Toxicology.

The University of Michigan has recently established an interdepartmental program in toxicology which will accept applications from students for study and training leading to the masters or doctorate degree. This program includes toxicology in its broadest concept and has a major emphasis upon biological mechanisms of toxicity. A number of training grants are available for students in this program. Further information may be obtained from Dr. Herbert H. Cornish, Chairman, Interdepartment Program on Toxicology, School of Public Health, The University of Michigan, Ann Arbor, Michigan. 48104

-- Am. Ind. Hyg. Assn. J. 28, 398 (July-Aug. 1967).

1023 Asbestos Dust and Cigarettes Pose Cancer Risk.

According to a recent study by three New York medical researchers (and reported in the June 6 issue of the Wall Street Journal) asbestos workers who smoke cigarettes have a ninetyfold greater risk of dying from lung cancer than persons who neither smoke nor work around asbestos. The researchers noted that microscopic asbestos fibers, once inhaled, remain permanently in the lung tissues. Asbestos workers who don't smoke cigarettes should never begin. Those who do, should stop now.

-- Natl. Safety News 96, 23 (Oct. 1967).

1024 Problem Drinking is Public Health Concern.

Economic havoc wrought by problem drinkers in the U.S. alone is enormous. In the nation's work force, for example, about 3% (1.7 million people) were alcoholics in 1965, according to the National Council on Alcoholism. Each alcoholic cost his employer about \$1,250 that year. In other segments of society, the cost of problem drinking is incalculable. For instance, of nearly 5 million arrests nationwide in 1965, more than 2.2 million were for drinking offenses, according to FBI data. The harm to families, the number of traffic accidents, juvenile delinquency, deaths, and financial burdens to the community that can be related directly and indirectly to problem drinking makes up one of the nation's serious public health problems.

-- Chem. Eng. News 45, 40 (Oct. 16, 1967).

1025 Prescription Drugs.

Only a few totally ineffective prescription drugs are on the market, but many claims offered for individual drugs will be subject to modification. This is one of the general findings to emerge from the first phase of a study of "old drugs" being made by the National Academy of Sciences (NAS). The Academy, at the request of the Food and Drug Administration, is assessing the manufacturers' claims for some 2,800 prescription drugs put on the market between 1938 and 1962. The NAS also finds that the package inserts for some effective drugs offer claims "for which evidence has not as yet been generated". A verdict of "possibly effective" or "probably effective" would give manufacturers time to dig up this evidence. NAS expects to complete the study next year.

-- Chem. Eng. News 45, 39 (Oct. 2, 1967).

1026 Census of Lasers.

The Public Health Service has started a nationwide census of lasers to find out how widely they are being used in industry and medicine. The survey will also determine how often lasers cause eye damage and burns to workers who use them. The purpose of the survey, the Public Health Service says, is to provide background for future legislation covering this new occupational hazard.

-- Chem. Eng. News 45, 47 (Oct. 9, 1967).

1027 U. S. Drowning Deaths Reach 7,000.

The National Safety Council estimate of 7,000 drownings in the U.S. in 1966 is the highest fatality figure attributed to this cause in 3 1/2 decades. About 2,700 were said to involve persons swimming or playing in the water. Of the remaining 4,300 (falls into the water, etc.), about 1,000 were attributed to boating and other water transportation. In all, water transportation accidents took between 1,100 and 1,500 lives, including machinery accidents, gas asphyxiation, etc.

-- J. Am. Med. Assn. 201, 25 (Sept. 18, 1967).

1028 Hospitalized Veterans.

The number of veterans hospitalized for emphysema and chronic bronchitis, lung diseases common to the aging, has more than doubled in eight years, the Veterans Administration reports. -- VA Filler Facts No. 18, Veterans Administration Information Service, Washington, D. C. (Jan. 1967). -- Arch. Environmental Health 15, 60 (July, 1967)

1029 Radiation Victim Gets Marrow Plant

A Cheswick, Pa. man, one of three employees exposed to rays from a three-million volt particle accelerator at Gulf's research center in Harmarville, Pa. has received a bone marrow transplant from his twin brother in an effort to save his life. A Gulf spokesman said the accelerator produces gamma rays in a high field when in operation and the men's bodies absorbed these rays. A spokesman from the National Radiation Center in Washington said "human error, system failure, or both could have caused the accident." The men were testing oil samples when the accident occurred, routine testing procedures carried out hundreds of times each year. -- The Pittsburgh Press, Oct. 20, 1967

1030 Soft Coal Industry Digging for 10,000 More Miners.

A six-year boom in the soft coal industry has produced a severe shortage of skilled miners that threatens to become critical soon, as the boom is expected to zoom rather than fizzle. At present, the industry employs about 125,000 miners. It "could profitably use 10,000 more right now, but we can't find them," said a spokesman for the bituminous coal mine operators. The industry foresees a need for between 50,000 and 75,000 additional trained miners to meet the production demands of an expanding market in five years. Coal miners averaged \$140.51 a week during last August, according to the U.S. Bureau of Labor Statistics. However, industry and union officials agree that it is extremely difficult to recruit young men in the coal mining areas to work in the mines. -- The Jersey Journal, Oct. 18, 1967

COMING EVENTS

- 1031 Dec. 1-3 American Academy of Psychoanalysis, (Mid-Winter), New York, New York.
Dec. 1-3 National Federation of Catholic Physicians' Guilds, (annual meeting), Anaheim, Ca.
Dec. 2-7 American Academy of Dermatology, Chicago, Illinois.
Dec. 5 American Industrial Hygiene Association, (Trisection Meeting), Cherry Hill, N.J.
Dec. 6 Society of Cosmetic Chemists, Semi-annual Meeting, New York, New York.
Dec. 10-14 American Academy for Cerebral Palsy, San Francisco, California.
Dec. 11-12 ACS Division of Industrial and Engineering Chemistry, 33rd Annual Chemical Engineering Symposium, Cambridge, Massachusetts.
Dec. 11-15 Metallurgical Society of AIME, 3rd Annual Operating Metallurgy Conference & Exposition, Chicago, Illinois.
Dec. 15-17 American Psychoanalytic Association, New York, New York.
Dec. 18-20 American Physical Society, Pasadena, California.
Dec. 20 Association for Advancement of Psychoanalysis, New York Academy of Medicine, New York, New York.
Dec. 26-31 American Association for the Advancement of Science, Annual Meeting, New York New York.

LEGAL DEVELOPMENTS

1032 Radiation, Uranium Miners.

The President approved a memorandum proposed by the Federal Radiation Council as radiation protection guidance for federal agencies relating to the underground mining of uranium ore. The memorandum provides that: (1) exposure be controlled so that no individual miner be exposed to more than six Working Level Months (WLM) in any consecutive three-month

period and no more than 12 WLM in any consecutive twelve-month period; (2) areas in underground uranium mines be monitored for the concentration of radon daughters in mine air; and (3) appropriate exposure records be established and maintained by uranium miners. John W. Gardner, HEW secretary and council chairman, advised the Joint Committee on Atomic Energy that the guidance provided in the memorandum would be reexamined "within approximately one year."

-- Natl. Safety News 96, 250 (Oct. 1967).

1033 Air Pollution Control Bill.

An air pollution control bill has been approved by the House Commerce Committee. The measure is the same as that passed earlier by the Senate except that direct grants to industry for developing new control techniques have been eliminated, the Government would have discretion to decide whether California could set tighter controls on auto exhaust than those in effect nationwide, and the three-year authorization of \$700 million in the Senate bill to carry out the program has been cut to \$428 million.

-- Chem. Eng. News 45, 47 (Oct. 9, 1967).

1034 Humane Treatment of Animals.

Several bills to set conditions for humane treatment of animals during laboratory experiments have been introduced in both House and Senate. Standards of treatment would be set by the Secretary of Health, Education, and Welfare. Violators could be forbidden to use animals for experiments and could be denied federal grants. Present law provides standards for collection and treatment of animals prior to experiments but says nothing about the conditions of experiments. By sheer coincidence the bills were introduced during National Dog Week.

-- Chem. Eng. News 45, 47 (Oct. 9, 1967).

1035 Pest Control.

The Federal Committee on Pest Control (FCPC) has taken on new responsibilities. Under a new charter, FCPC will be responsible for furnishing advice on U.S. pest control operations in foreign countries and for cooperating with the states and local groups on pest control problems. FCPC will also get involved in policy matters, such as developing guidelines for the safe control of insects, rodents, weeds, plant diseases, and other pests. The committee—headed by the Office of Science and Technology, and made up of the Secretaries of Agriculture, Interior, Defense, and Health, Education, and Welfare—began operations in 1961 as the Federal Pest Control Review Board. In 1964 the present name was adopted and FCPC was made responsible for coordinating all federal pest control programs.

-- Chem. Eng. News 45, 41 (Sept. 18, 1967).

1036 Flammable Fabrics.

The Senate passed without debate S. 1003, an Administration-backed bill to amend the Flammable Fabrics Act. The bill: (1) expands the prior law to cover all household and personal fabrics; (2) authorizes the secretary of commerce to issue new or revised flammability standards to keep up with changing technology and public interest; (3) directs the secretary of HEW to conduct a comprehensive and continuing investigation of deaths, injuries and economic losses resulting from accidental burns; (4) authorizes the secretary of commerce to conduct research into the Flammability of Fabrics and the development of improved testing methods; and (5) authorizes the Federal Trade Commission to require business to keep records on items usable for "interior furnishing" or "wearing apparel."

-- Natl. Safety News 96, 250 (Oct. 1967).

BOOKS, PAMPHLETS AND NOTICES

- 1037 Air Pollution—1967 (Automotive Air Pollution) Part I. U.S. Subcommittee on Air and Water Pollution. Hearings from the Subcommittee on Air and Water Pollution of the Committee on Public Works U.S. Senate, 90th Congress, First Session on Problems and Progress Associated with Control of Automobile Exhaust Emissions. 746 pp. (1967). AVAILABLE FROM: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. PRICE: not given.

In this volume, the subcommittee's hearings in Los Angeles and Detroit in February, 1967 are reported verbatim. The following quotes indicate the importance of this reference to all

those interested in following discussions, pro and con, concerning implementation of the Air Quality Act: Senator Tydings: "Supervisor Dorn," (Warren Dorn, supervisor, Board of Supervisors, County of Los Angeles, State of California), "the proposed Air Quality Act of 1967, which is the basis for these hearings, would set emission control levels for industry, which contributes heavily to air pollution. On the basis of your experience-setting regulations on emission control for industries in Los Angeles County, how stringent do you think the Federal standards should be?" Mr. Dorn: "I think you ought to take our rules and just enact them and enforce them. It would save you the money that would be spent on research and development of such rules." Senator Tydings: "Would you generally characterize the stringency of your standards insofar as industrial pollution is concerned in Los Angeles?" Mr. Dorn: "We just don't allow it." Senator Tydings: "Period?" Mr. Dorn: "Period."

Mr. Joseph M. Callahan, Engineering Editor, *Automotive News*, "The threshold or first real trace of photochemical smog was reached for one hour or more on 83 days in Los Angeles during the year of the (USPHS) test. By contrast, the other pollution-prone cities in the study reached this threshold for an hour or more on a total of only 39 days in one year—or an average of less than five days a year per city. This points up the huge mistake we are making when we assume that the atmosphere in Los Angeles typifies the atmosphere in the rest of the country now. It also points up the great mistake of assuming that Los Angeles' atmosphere is a forerunner of the entire country's atmosphere at some future date." Senator Murphy: "I should resent that but I won't." Mr. Callahan: "Some factors that make possible the photochemical smog in Los Angeles will never be duplicated in the rest of the country. One of these is the surrounding mountain range that prevents the horizontal ventilation of the area, thereby making possible the 10 or 12 chemical reactions in the sunlight that are needed to produce photochemical smog. These mountains are one reason why Los Angeles has the lowest average wind velocity of any large city in the country. Other unusual factors in Los Angeles that contribute to the making of this smog are (1) the frequent prolonged inversions or atmospheric 'lids' that prevent the vertical ventilation of the area, (2) a good deal of warm weather and sunlight—for you, Senator—and (3) a large vehicle population." Senator Muskie: "Plus Hollywood." Senator Murphy: "Not as bad since I left. . . ." Mr. Callahan: "So here we have the Nation's air pollution problem as I see it as relates to automobiles. We have photochemical smog frequently in Los Angeles; we have it occasionally in seven other metropolitan areas; we have conflicting information about the carbon monoxide trend in some cities, and we have no oxides of nitrogen problems. Compare this rather minor automobile-caused pollution problem with the massive, costly, and complex solution that is being applied. First of all, there is the \$5 positive crankcase ventilator that has been applied to all new cars since 1963. It takes out an estimated 25% of all the carbon monoxide and costs about \$5. In addition to the positive crankcase ventilator there are the \$18 to \$50 exhaust control devices that will be required on all new cars beginning this fall. These two devices alone may cost American Motorists upwards of \$400 million a year, plus many operating and maintenance problems, without materially improving the air we breathe. However, they will eliminate two-thirds of all automotive emissions. These devices appear to us to be a serious overresponse to the problem. However, our concern is even greater about the several other devices that will be made mandatory on all U.S. cars in the future."

"The Secretary of Health, Education, and Welfare has informed us that beginning next year every new car must have a device to control evaporation from the carburetor and fuel tank. This is not a simple device because the evaporation must be controlled during three different periods—when the car is parked, when the engine is running, and immediately after the engine is shut down during the hot-soak period. The best known device, which is not completely engineered yet, could add another \$20 to each car, and it is unlikely to save fuel. The fourth device looming on the horizon in addition to the previous three is a mechanism to control the oxides of nitrogen which, according to the Public Health Services' Vernon MacKenzie (Deputy Director, Bureau of Disease Preventive & Environmental Control, Public Health Service), must be controlled. When it is available, this device also is likely to be costly and complex because almost anything done to reduce nitrogen oxides increases the hydrocarbon and carbon monoxide emissions, and vice versa. One of the prime concerns to me as a motorist is that Mr. S. Smith Griswold (Associate Director for Abatement & Control, Public Health Service, Department of Health, Education & Welfare), the Government's chief air pollution abatement officer, has decreed that any device required for one part of the country will automatically be made mandatory for the entire country. I do not know if Congress had this intention when it empowered the Secretary of HEW to set automobile emission standards in 1965. Nevertheless, this does point up a recent comment by Senator Mike Mansfield, the Senate majority leader, that one of the major problems today is the growing tendency of Congress:

to delegate its authority to nonelective members of the government. A fifth device, which might be required as soon as 1970 is a catalytic muffler or afterburner which would be in addition to the previous four devices. California already has lowered the permissible limits on hydrocarbons and carbon monoxide emissions by one-third for 1970 and there are indications that some such device would have to be used in combination with air in injection or the engine-modification kit to meet these lower standards.

Such opposing opinions represent varying and important points of view. This report also includes many useful references in toto among which are: Air pollution control district, County of Los Angeles, rules and regulations; Air pollution from aircraft in Los Angeles County—A report of the engineering division, December 1965; Automobile Club of Southern California—Compulsory periodic motor vehicle inspection; Chronological list of General Motors contributions to air pollution studies; Effect of fuel antiknock compounds and deposits on exhaust emissions by J. C. Gagliardi, Ford Motor Co.; Effectiveness of exhaust control on 1966 vehicles by the State of California Motor Vehicle Pollution Control Board, August 10, 1965; Exhaust emission control by Chrysler—The cleaner air package; and many others.

- 1038 Air Pollution—1967 (Air Quality Act) Part 2. U.S. Subcommittee on Air and Water Pollution. Hearings before the Subcommittee on Air and Water Pollution of the Committee on Public Works United States Senate, 90th Congress, First Session on S. 780 and related matters pertaining to the prevention and control of air pollution. pp. 747-1116 (1967) AVAILABLE FROM: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. PRICE: not given.

Initial testimony from Washington D.C. hearings on February 8, 1967 is reported: In this volume Hon. John W. Gardner, Secretary of Health, Education and Welfare, accompanied by Ralph Huitt, Assistant Secretary for Legislation, were witnesses. Among others were Dr. Ivan L. Bennett, Jr., Deputy Director, Office of Science and Technology, Executive Office of the President, on behalf of Dr. Donald F. Hornig, Special Assistant to the President for Science and Technology; J. Herbert Holloman, Acting Under Secretary of Commerce, accompanied by Dr. Robert M. White, Administrator; Donald Pack, Acting Director, Air Resources Laboratory; Robert Ellert, Senior Staff Attorney, Environmental Science Services Administration, and Arthur C. Stern, Assistant Director, National Center for Air Pollution Control, Public Health Service.

- 1039 Air Pollution—1967 (Air Quality Act) Part 3. U.S. Subcommittee on Air and Water Pollution. Hearings before the Subcommittee on Air and Water Pollution of the Committee on Public Works United States Senate, 90th Congress, First Session on S. 780 and related matters pertaining to the prevention and control of air pollution. pp. 1117-2229 (1967). AVAILABLE FROM: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. PRICE: not given.

This volume includes testimony from United States Public Health Service Surgeon General Dr. William H. Stewart accompanied by Dr. John Middleton, Vernon MacKenzie, and S. Smith Griswold. On pages 2031-2035 are presented the 20 Standard Metropolitan Statistical areas having the most severe problems.

- 1040 Air Pollution—1967 (Air Quality Act) Part 4. U.S. Subcommittee on Air and Water Pollution. Hearings before the Subcommittee on Air and Water Pollution of the Committee on Public Works United States Senate, 90th Congress, First Session on S. 780 and related matters pertaining to the prevention and control of air pollution including testimony on the current status of control technology. pp. 2231-2694 (1967). AVAILABLE FROM: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. PRICE: not given.

This volume reports testimony from two individuals who have spoken on Industrial Hygiene Foundation Annual Meeting Programs in past years: Allan D. Brandt, Manager, Industrial Health Engineering Division, Industrial and Public Relations Department, Bethlehem Steel Corporation, and James R. Garvey, President and Director of Research, Bituminous Coal Research, Inc., Monroeville, Pa. Among other witnesses were the following individuals from government, industrial, academic and research institutions who are quoted: Dr. Walter Hibbard, Chief, Bureau of Mines, Department of the Interior, accompanied by Harry C. Allen, Jr., and William Crenztz; Joseph C. Stites, Jr., enterprise manager, air pollution control, Commercial Development Department, Inorganic Chemicals Division, Monsanto Co.,

St. Louis, Mo., accompanied by Cecil Underwood and John Miller; James Jonakin, assistant manager, Kreisinger Development Laboratory, Combustion Engineering, Inc., Windsor, Conn.; H. H. Meredith, Jr., coordinator of air and water conservation, Humble Oil & Refining Co., representing the American Petroleum Institute, accompanied by C. W. Lubbock, member of the task force, American Petroleum Institute, Houston, Texas; Sherman K. Reed, director, central research department, FMC Corp., accompanied by Norris J. Brunsvold, FMC Corp., Princeton, New Jersey.

- 1041 Electric Vehicles and Other Alternatives to the Internal Combustion Engine. U.S. Committee on Commerce S. 451 and S. 453. Joint Hearings Before the Committee on Commerce and the Subcommittee on Air and Water Pollution of the Committee on Public Works United States Senate. 90th Congress, First Session. 550 pp. (1967). AVAILABLE FROM: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. PRICE: \$1.75.

This volume reports verbatim discussions of Sen. Bills 451 and 453 which are intended, respectively "To amend the Clean Air Act in order to authorize an investigation and study to determine means of propelling vehicles so as not to contribute to air pollution" and "To authorize a program of research, development, and demonstration projects for electrically powered vehicles." An indication of the extent of research already reported to be devoted to commercial passenger electric vehicle technology is given in a footnote to page 7, which quotes Mr. Vernon G. MacKenzie (Deputy Director, Bureau of Disease Preventive and Environmental Control, Public Health Service) as saying on September 26, 1966 that Federal programs now involve an expenditure of \$9 million annually, primarily by the Department of Defense and that private industry is estimated to be spending at a similar rate.

INDUSTRIAL MEDICAL PRACTICE

- 1042 Dispersion of Aerosols in Hospitals Utilizing Aerosol Inhalation Therapy. M. Corn and Mary Y. Flynn. *Am. Ind. Hyg. Assn. J.* 28, 386-387 (July-August, 1967).

Uranine dye was used to trace the dispersion of aerosol produced by a De Vilbiss ultrasonic generator used for inhalation therapy of a bedridden hospital patient. Air for ventilation of the hospital room was supplied through ceiling level grilles; air was exhausted through outlets in the hospital corridor. Particles of uranine, formed after evaporation of aerosol droplets, were detected in the hospital corridors by sampling with Millipore HA filter paper and analyzing the sample fluorimetrically for uranine. The authors' results suggest that infectious agents, as well as dye, could be dispersed throughout the hospital and that inhalation therapy should be administered in hospital rooms where ventilation air is supplied from the corridor and exhausted from the therapy room. There are 7 references. -- Authors' abstr.

- 1043 Microbiological Studies of Air in the Operating Room. C. R. Ford, D. E. Peterson, and C. R. Mitchell. *J. Surg. Res.* 7, 376-382 (August, 1967).

Contamination of operating room air by bacterial organisms fluctuates in direct relationship to human activity in a given operating room. In a three-year study period the clean-wound infection rate was 3.14%. Air contamination in operating rooms varied between 1.5 and 18.3 microorganisms/cu. ft. depending on human activity present. The peak incidence of microorganisms in the air was between 8:00 AM and 11:00 AM. There was a precipitous rise of organisms as personnel began activity, and a rapid drop in afternoon hours as personnel activity diminished. Concentrations of pathogenic organisms in the air of operating rooms is small, but their presence is without question. Airborne pathogens can and do contaminate and occasionally infect the clean surgical wound. Traffic control in operating rooms is a valid recommendation. - J. Am. Med. Assn. References & Reviews

- 1044 Effect of Electrostatic Charge on the Contamination of Plastic Food Containers by Airborne Bacterial Spores. L.D. Baribo, J.S. Avens, and R.D. O'Neill. *Appl Microbiol.* 14, 905-913 (November, 1966).

The negative static charge accumulated on plastic food containers during their manufacture, which remains indefinitely on many of the finished products, is of an intensity and polarity to attract positively charged bacterial cells that might be present in the air. There are 13 references. -- Public Health Eng. Absts.

- 1043 Road Traffic, Tranquilizers, and Alcohol. P. Kielholz, et al.
Deut. med. Wochschr. 92, 1525-1531 (September 1, 1967).

It was investigated whether or not the tranquilizers chlordiazepoxide and meprobamate, either alone or in combination with alcohol, affected driving skill. Double-blind tests were carried out on 120 volunteers from the police force of Basel. They were given either a placebo, 400 mg. of meprobamate, 10 mg. chlordiazepoxide, or a combination of one of the drugs with alcohol, and their driving ability was then assessed under normal road conditions and on a specially designed track. During these tests the concentration of alcohol and of the drugs in the blood and the reaction time were determined. The persons taking part in the test were also asked by questionnaire for their subjective view of their performance. In the doses administered neither chlordiazepoxide nor meprobamate affected driving skill, nor did they appreciably potentiate the effects of alcohol. There was, however, a highly significant impairment of driving skill, when the blood alcohol had reached a concentration of 0.8 per 1,000.

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

- 1046 Maximum Acceptable Weight of Lift. S. H. Snook and C. H. Irvine.
Am. Ind. Hyg. Assn. J. 28, 322-329 (July-August, 1967).

This paper discusses the maximum amount of weight that an individual can be expected to lift comfortably and without strain. Recommendations based on empirical estimates, biomechanical techniques, and psychophysical methods are reviewed, including those of the International Labour Office, the Swiss Accident Insurance Institute, the Danish National Association for Infantile Paralysis, and the U.S. Air Force. The approach used in two Air Force experiments is identified as a variation of the psychophysical method of magnitude production. An improved experimental design is described which includes the following advantages: (1) The control of additional variables not considered in previous studies. (2) Experimental controls and statistical procedures found necessary for use in psychophysical experiments. (3) Instructions and tasks which are more applicable to industrial situations. (4) Subjects who are experienced industrial workers, older and better conditions to the lifting task. The results collected to date are discussed and compared with those of other investigators. There are 12 references.

-- Authors' abst.

- 1047 A Survey of Hearing Conservation Programs in Representative Aerospace Industries. Part I. Prevalence of Programs and Monitoring Audiometry. W. F. Rintelmann and D. C. Gasaway.
Am. Ind. Hyg. Assn. J. 28, 372-380 (July-August, 1967).

Questionnaires were sent to 600 assorted aerospace industrial firms. Responses were received from 336 firms. Fifty-three companies reported having fully developed hearing conservation programs. Responses were categorized and analyzed according to: (1) General descriptive information; (2) monitoring of hearing conservation programs; and (3) types of audiometric tests, test environments, instrumentation and administration of audiometric tests. There are 16 references.

-- Authors' abst.

- 1048 Mucociliary Clearance Rates. Deposition and Clearance in the Tracheobronchial Tree of Rats. A. A. Spritzer, J. A. Watson, and Judith A. Auld. Arch. Environmental Health 15, 39-47 (July, 1967).

The tracheobronchial tree serves the major roles in minimizing the retention of inhaled particles. The tree acts as a filtering network which protects the deep part of the lung, and it serves as the final pathway in the removal of particulates which are carried to it from the lower respiratory tract. Such particulates following transport to the mucociliary epithelium are carried by this mechanism to the tracheal orifice and the oropharynx, from which point they are usually swallowed or may be expectorated. The authors' experiments on rats demonstrate a method of determining clearance and clearance rate data in the period immediately following exposure. The technique permits the assessment of the effects on mucociliary clearance of variables or stresses which may influence either the deposition of particles or the mucociliary escalator mechanism. Three references are given.

- 1049 Acute Respiratory Distress in Adults. D. G. Ashbaugh, et al.
Lancet 2, 319-323 (August 12, 1967).

The respiratory-distress syndrome in 12 patients was manifested by acute onset of tachypnea, hypoxemia, and loss of compliance after a variety of stimuli; the syndrome did not respond to usual and ordinary methods respiratory therapy. Clinical and pathological features closely resembled those seen in infants with respiratory distress and those in congestive atelectasis and postperfusion lung. The theoretical relationship of this syndrome to alveolar surface active agent is postulated. Positive end-expiratory pressure was most helpful in combating atelectasis and hypoxemia. Corticosteroids appeared to have value in the treatment of patients with fat embolism and possibly viral pneumonia. -- J. Am. Med. Assn. References & Reviews

- 1050 Comparison of Two Dosages of Ragweed Extract in the Treatment of Pollenosis. W. Franklin and F.C. Lowell. J. Am. Med. Assn. 201, 915-917 (September 18, 1967).

A double-blind study was carried out to determine the effect of dosage in the treatment of ragweed hay fever with injections of aqueous ragweed pollen extract. Two concentrations of extract were used, one 20-fold smaller than the other. The volumes administered were such that the dose at the higher concentration was close to the maximum that it is practical to administer. During the ragweed season, the group of patients receiving the higher concentration fared significantly better than the group receiving the lower concentration. It is concluded that large dosages of pollen extract are more effective than small dosages in the treatment of hay fever. The findings indicate that the very low dosages recommended by some would have little influence on the course of pollenosis. There are 6 references. -- Authors' abst.

- 1051 Oral Contraceptives. Renin, Aldosterone, and High Blood Pressure. J.H. Laragh, et al. J. Am. Med. Assn. 201, 918-922 (September 18, 1967).

A relationship was established between the institution of oral contraceptive therapy and the development or enhancement of high blood pressure in eight of 11 patients. In six of eight patients who stopped taking medication, marked improvement or complete correction of hypertension occurred. In two patients, with a second trial of treatment, hypertension again appeared and disappeared. Oral contraceptive therapy produced impressive abnormalities in renin-substrate concentration and in its reactivity to exogenous renin as well as in endogenous renin activity and aldosterone excretion. The relevance of these abnormalities to the development of hypertension is not clear because similar effects occur in treated normotensive women. Further study of a possible connection between excesses of estrogenic and progestogenic substances, renin, aldosterone, and hypertension seems warranted. There are 16 references. -- Authors' abst.

- 1052 Acute Leukemia and Infection. M. V. Viola. J. Am. Med. Assn. 201, 923-926 (September 18, 1967).

The clinical records of 78 patients with acute leukemia revealed that infection was the major single cause of death. Gram-negative bacteremia was responsible most often, although staphylococcal bacteremia was still a significant cause of death. Pneumonitis, bacteremia, and skin infections were the most common types of bacterial infections. An increase in the occurrence of infections with gram-negative organisms was noted. The source of most cases of gram-negative bacteremia was ulceration of the intestinal tract, although a number of patients had no source demonstrable. Serious fungal infections occurred in 14% (11) of patients studied. Most disseminated fungal infections were not diagnosed during life. Infections of all types increase with the duration of the disease and with the use of multiple therapeutic agents. Granulocytopenia appears to predispose to bacteremia and fungal infections. There are 19 references. -- Author's abst.

- 1053 Gastroenteritis From an Orange Juice Preparation. I. Clinical and Epidemiological Aspects. I.R. Tabershaw, L.L. Schmelzer, and H.B. Bruyn. Arch. Environ. Health 15, 72-77 (July, 1967).

An outbreak of gastroenteritis occurred among spectators at a football game. The symptoms were characteristic of epidemic gastroenteritis: nausea, vomiting, diarrhea, chills, fever, and headache. The disease was of short duration and recovery uneventful. At least 563 students were treated in the outpatient department of the student hospital, 81 of whom were

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admitted for further treatment or observation. By computation from the sample it is estimated that 5,200 people may have been affected. The epidemiological evidence points unequivocally to an "orange freeze" as the source of the epidemic. There are 9 references.

-- Authors' summary.

- 1054 Gastroenteritis From an Orange Juice Preparation. II. Field and Laboratory Investigation. L.L. Schmelzer, et al. Arch. Environmental Health 15, 78-82 (July, 1967).

An outbreak of gastroenteritis occurred among spectators at a football game. There were 563 students who sought treatment at the student health service hospital. The source of the epidemic was a frozen orange juice preparation. Conventional cultural methods failed to reveal any of the common enteropathogens from patients' stools or from the orange freeze: an extensive study failed to reveal any viral agent in the patients' stools. Samples of unsold orange freeze showed the presence of large numbers of microorganisms when studied bacteriologically with special techniques. There is circumstantial evidence that the water used to dilute the orange concentrate may have introduced the bacteria found in the sample of the unsold orange freeze. In the absence of any other demonstrable cause, it is postulated that the large dose of bacteria was responsible for the cases of gastroenteritis, but more likely the cause was an associated virus. There are 8 references.

-- Authors' summary

- 1055 Prevention of Renal Necrosis by Stress. H. Selye, U.S. Pahk, and A. Somogyi. J. Am. Med. Assn. J. 201, 1026-1029 (September 25, 1967).

By obstructing the renal hilus for two hours with a specially constructed clip, it is possible to produce a selective necrosis affecting the medulla of the rat kidney. Despite total cessation of urine secretion, the cortex, though altered in its structure, continues to live for many weeks without producing hypertension, generalized periarteritis nodosa, or nephrosclerosis on the opposite side. In these respects as well as in its histologic structure, this "cortical kidney" differs essentially from the "endocrine kidney" elicited by permanent but partial restriction of the renal blood flow. Exposure to systemic stress (restraint, spinal-cord transection) and treatment with certain drugs (chlorpromazine hydrochloride, cyproheptadine hydrochloride) offer virtually complete protection against the macroscopic and histologic manifestations of the ischemic renal necrosis thus produced. It would be premature to speculate upon the mechanism of this prophylactic effect. Yet, as a working hypothesis it might be imagined that ischemic necrosis is not a mere passive process depending upon the lack of oxygen and nutrition, but also a kind of active self-amputation of damaged tissue through the sudden massive activation or discharge (eg., from lysosomes) of histolytic enzymes (eg., proteases). Both in local and in systemic stress, the characteristic catabolism and tissue destruction is largely dependent upon histolytic enzymes. Pretreatment with certain drugs or stressors could lead to a release of these enzymes sufficiently slow to permit their gradual inactivation; under these conditions they would produce catabolism but no necrosis. After exhaustion of the enzyme reserve, temporary ischemia might do no harm, while normally (in the untreated animal) it would cause necrosis due to sudden and massive enzyme release. This mechanism could be compared to the production of anaphylactoid edema by mast cell dischargers in untreated rats but not in animals whose mast cells had been previously discharged. Other mechanisms through which systemic stress might protect are the liberation of enzyme inhibitors, hypothermia, or prevention of blood vessel damage by hypotension. In any event, it is clear that here close correlations exist between local and systemic stress. The easily reproducible protection against renal necrosis is one of the most striking examples of the "nonspecific resistance" induced by stress, a phenomenon which had been demonstrated previously on many other models such as acute lung edema, inflammation, and cardiac necrosis. There are 16 references.

- 1056 Fatal Connective Tissue Disease Following a Wasp Sting. B.J. Fogel, T. Weinberg, and M. Markowitz. Am. J. Diseases Children 114, 325-329 (September, 1967).

A case of a fatal generalized connective tissue disease following a wasp sting is presented. Although it could be argued that the patient may have had some vague clinical manifestations prior to the wasp sting, his illness probably resulted from being stung by a wasp.

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

- 1057 From Epidemiology to Ecology—Smoking and Health in Transition. A Panel Discussion. *Ann. J. Public Health* 56, Pt. II (Supplement) 43 pp. (Dec. 1966).

This panel discussion presents three papers on behavioral research and morbidity in relation to smoking habits; a progress report on developments since the Surgeon General's Report on Smoking and Health; and four discussions of the possible impact resulting from changed smoking habits on the fields of agriculture, business, advertising, and tax revenues. Seven references are given. -- Public Health Eng. Absts.

- 1058 Effect of Cigarette, Cigar, and Pipe Smoking on Nicotine Excretion. A. Kershbaum, et al. *Arch. Internal Med.* 120, 311-314 (September, 1967).

A comparative study of urinary nicotine excretion with cigarette, cigar, and pipe smoking was made, using a gas chromatographic method to determine the nicotine content of the urine. In 29 normal male smokers, smoking cigarettes in the customary manner of inhaling, and cigars and pipes in the customary manner of not inhaling, about three times the quantity of nicotine was excreted with cigarettes than with cigars or pipes. There was no significant difference in nicotine excretion between cigar and pipe smoking. In each of ten subjects, cigarettes, cigars, and pipes were smoked, both with inhaling and without inhaling; there was no significant difference in mean nicotine excretion with the three forms of smoking when all were inhaled or all not inhaled. In anesthetized dogs, equivalent amounts of cigarette, cigar, and pipe tobacco smoke were administered intratracheally with inhalation kept constant. Nicotine excretion was similar with each tobacco form. The greater nicotine excretion with cigarette smoking is a result of the tendency to inhale cigarettes. The differences in nicotine excretion are probably a consequence of similar differences in nicotine absorption.

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

- 1059 Pheochromocytoma and Smoking. W. M. Dugan, Jr. *Arch. Internal Med.* 120, 365-370 (September, 1967).

A patient with recurrent pheochromocytoma, who demonstrated hypertensive paroxysms induced by smoking, is reported. The relationship between nicotine and catecholamine release is discussed.

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

- 1060 Pigeon Breeder's Lung. P. Maloney. *Med. J. Australia* 1, 969-972 (May 13, 1967).

A case of pigeon breeder's lung is described. On repeated exposure to pigeons and their droppings, the patient developed recurrent interstitial pneumonia, which resolved spontaneously when exposure to pigeons was restricted. Pigeon antibodies were demonstrated in the patient's serum. There are 10 references.

-- Author's abst., Public Health Eng. Absts.

- 1061 Pre-exposure Prophylaxis Against Rabies. Comparison of Regimens. E.S. Tierkel and R.K. Sikes. *J. Am. Med. Assn.* 201, 911-914 (September 18, 1967).

During investigations to determine a satisfactory, practical pre-exposure regimen for administering rabies vaccine to groups of people at high risk, a total of 540 volunteers received vaccine of chick or duck embryo origin. The results of these studies indicate that the most practical regimen consists of two subcutaneous injections of 1.0 ml. of duck embryo rabies vaccine given a month apart followed by a booster of 1.0 ml. of the vaccine seven months after the second injection. Ninety per cent of the volunteers who were on this regimen had a detectable serum neutralizing antibody titer one month after the last injection. There are 13 references.

-- Authors' abst.

- 1062 The Pulmonary Reactions to Toxic Gases. P. Gross, W.E. Rinehart, and R.T.P. deTreville. *Am. Ind. Hyg. Assn. J.* 28, 315-321 (July-August, 1967). (Reprints available from IHF).

The deep pulmonary response to toxic gases depends upon which of the two components of the alveolar wall is responding, the capillary or the alveolar membrane. Injury to the capillary results in pulmonary edema or bronchopneumonia. Whereas, a dose of irritant injuring substantially only the alveolar membrane causes the latter to respond with the development of a multi-layered cell mass that is supported by argyrophilic fibers. Because collagenization of

this stroma does not usually occur, such septal lesions caused by noxious gases resolve. The respiratory bronchiole is the site of predilection of lesions caused by deep lung irritants because of delayed clearance in this region.

-- Authors' abstr.

- 1063 Bites by Copperheads (*Ancistrodon contortrix*) in the United States. H.M. Parrish and Carole A. Carr. J. Am. Med. Assn. 201, 927-932 (September 18, 1967).

An estimated 2,920 people are bitten by copperheads (*Ancistrodon contortrix*) annually in the United States. The incidence of bites by these venomous snakes is 16.4 per million population per year. However, the case-fatality rate is exceedingly low, about 0.01%. States having the highest bite rates per million population per year are North Carolina, 157.8; West Virginia, 105.3; Arkansas, 92.9; Oklahoma, 61; Virginia, 48.7; and Texas, 44.2. Males had higher bite rates than females, and white had higher rates than nonwhite. Most of the bites happened in the victims' own yards from April through October. Ninety-eight per cent of the bites were inflicted on the extremities: 36% on the upper and 62% on the lower extremities. The treatment recommended includes incision and suction, "the 3A's" (antivenin, antibiotics and antitetanus prophylaxis), and general supportive measures. There are 14 references.

-- Author's abstr.

SKIN DISEASES AND BURNS

- 1064 Prevalence of Epoxy Resin Dermatitis. L.E. Gaul. Arch. Dermatol. 96, 227-230 (September, 1967)

In 1957 the first instance of epoxy glue dermatitis was observed. Contact tests which reproduced in miniature fashion the manner of exposure to the glue and its hardener established the epoxy resin as the chief sensitizer. This glue has now become a rather common cause of eczematous dermatitis, ranking in incidence with thiosalicylic acid and nickel. The most frequent areas of involvement are the hands and forearms. The opportunities for industrial exposure are many and diverse. A positive patch test to epoxy in a housewife proved an alert for household contactants from this resin. A suitable patch test concentration is 1% epoxy resin in petrolatum.

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

- 1065 Occupational Dermatitis From Naled. A Clinical Report. W.F. Edmundson and J.E. Davies. Arch. Environmental Health 15, 89-91 (July, 1967).

Naled is a contact and stomach insecticide and acaricide which has the chemical name of 1,2-dibromo-2,2-dichloroethyl dimethyl phosphate. This is rather an unusual organophosphate pesticide in that it is brominated. The acute oral 50% lethal dose (LD₅₀) to rats is about 430 mg./kg. and the acute dermal LD₅₀ to rats is about 1,100 mg./kg., relatively low values of toxicity compared to highly toxic organophosphates, such as parathion, but higher than others, such as malathion. Naled is insoluble in water in which it rapidly hydrolyzes, and is highly soluble in aromatic solvents such as xylene. In the present report several women developed dermatitis while working with plants which had been sprayed with a mixture containing naled. The authors recommend that after naled has been used on vegetation that workers not be exposed to the material for several hours after the application of the chemical.

- 1066 Ethylenediamine Contact Dermatitis. T.T. Provost and O.F. Jillson. Arch. Dermatol. 96, 231-234 (September, 1967).

Thirteen patients having contact dermatitis and a positive patch test to 1% solution of ethylenediamine were evaluated during a four-month period. Eleven of the patients presented with a severe generalized patchy eczematous eruption. Two medical sources of ethylenediamine that were found are aminophylline USP and Triamcinolone acetonide with neomycin, gramicidin, and nystatin. Twelve of 13 patients had recently used triamcinolone acetonide with neomycin, gramicidin, and nystatin. None had used aminophylline-containing medications. Two patients who had been sensitized topically to ethylenediamine, when given aminophylline developed an exacerbation of their general eczematous eruption. Ethylenediamine is reputedly widely used in industry.

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

- 1067 Folic Acid Deficiency in Patients With Skin Disease. S. Shuster, J. Marks, and I. Chanar. Brit. J. Dermatol. 79, 398-402 (July, 1967).

Patients with skin disease are known to have an abnormality of folic acid metabolism shown by an increase in the excretion of formimino-glutamic acid (FIGLU) in the urine after an oral dose of L-histidine. Thirty-three patients, 22 erythrodermic and the rest having psoriasis or eczema involving more than half the body surface, were chosen for study. Nineteen out of 30 patients excreted an increased amount of FIGLU in the urine. Twenty-one out of 28 patients had a low serum folate concentration. Eleven of the 25 patients in whom both urinary FIGLU and serum folate were measured showed abnormalities in both. By contrast the serum B₁₂ level was normal in all but one patient in whom it was measured. The serum folic acid level does not correlate with hemoglobin concentration, the amount of stearic acid excreted in the feces, or the serum iron concentration.

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

CHEMICAL HAZARDS

- 1068 Irradiated Automobile Exhaust. Its Effects on the Reproduction of Mice. T.R. Lewis, F.G. Hueter, and K.A. Busch. Arch. Environmental Health 15, 26-35 (July, 1967).

Although information on reproduction and its associated disciplines is voluminous, little is known concerning the effects of air pollutants on conception, fetal development, fecundity, and survival pattern of the newborn. Kotin and Thomas exposed C₅₇ black mice to synthetic smog (produced by reacting gasoline and ozone). Conception rates decreased significantly; when conception occurred, the decrease in the number of pups per litter in the test animals bordered on statistical significance. The effect of the synthetic smog was most severe on new-born pups, practically all of which died prior to weaning. A study by Hueter et al demonstrated decreased parental fertility and fecundity along with decreased infant survival when mice were housed in an atmosphere containing irradiated automobile exhaust. The purpose of the present study was to define the relative importance of pre-exposure of each member of the sexual pair; and exposure of the female partner and her litter, following removal of the male, with regard to conception, fetal development, fecundity, and infant survival. There are 20 references.

-- Authors' introduction

- 1069 Acute Toxicity of Irradiated Auto Exhaust. Its Indication by Enhancement of Mortality From Streptococcal Pneumonia. D.L. Coffin and E.J. Blommer. Arch. Environmental Health 15, 36-38 (July, 1967).

Results indicate that the light-irradiated automobile exhaust produced for this study enhances mortality to infectious pneumonia similarly to the pure gases previously demonstrated. Since auto exhaust is a complex mixture containing many substances, assigning the effect noted to any particular gas is difficult. To look at the exhaust mixture first in terms of nitrogen dioxide and ozone, which are known to enhance mortality in the infective system, would be of value. The authors' data show that chamber nitrogen dioxide levels never approach the toxic level to produce such an effect (3.58 ppm). Oxidant levels, however, were well within the effective range for ozone where threshold values of 0.08 to 0.1 ppm have been noted. The lowest average value for oxidant where effect was noted appeared to be 0.15 ppm. This value is rather consistent with the threshold for ozone (0.08 to 0.1 ppm). Because of the possibility of interactions with other substances either as inhibitors or intensifiers, however, the effect could not be ascribed solely to ozone. The authors conclude that laboratory-synthesized photochemical smog enhanced mortality to streptococcal pneumonia in mice at certain levels of carbon monoxide and oxidant. These levels are well below peak concentration in heavily polluted air, 22 ppm and 0.14, respectively. There are 10 references.

-- Cond. from authors' conclusions

- 1070 Carbon Monoxide Control in a High Highway Tunnel. J.M. Miranda, V.J. Konopinski, and R.I. Larsen. Arch. Environmental Health 15, 16-25 (July, 1967).

A 1.6-mile-long, 2 mile-high vehicular tunnel is planned for construction at Straight Creek, in the Rocky Mountains 60 miles west of Denver. Both elevation and carbon monoxide in the tunnel will tax the oxygen-carrying capacity of the blood of tunnel employees and individuals

traveling through the tunnel. Based on present information, it is recommended that: (1) Carbon monoxide concentration in the tunnel be maintained below 25 ppm with one-hour averages no higher than 50 ppm and short term peaks no higher than 75 ppm. (2) Signs be placed on the route to the pass to warn sensitive individuals of the dangers of high elevations and smoking and to suggest possible alternate lower routes. (3) Oxygen masks be provided at the tunnel for emergency use. (4) Construction workers who will be responsible for building the tunnel be carefully screened for cardiopulmonary abnormalities, as well as blood dyscrasias (sickle cell anemia). After screening the workers, a 7- to 14-day period of progressively increasing exercises will be necessary to obtain some degree of acclimatization. The men who cannot acclimatize efficiently will be the ones most likely to develop symptoms of hypoxia (eg. headache, vertigo, lethargy, easy fatigue, and sleepiness). There are 37 references.

-- Cond. from authors' summary

- 1071 Semiautomated Determination of Fluoride in Urine. H. A. Derner.
Am. Ind. Hyg. Assn. J. 28, 357-362 (July-August, 1967).

A procedure has been developed, using the Technicon Auto Analyzer, for the determination of fluoride in urine, which does not require ashing or fusion of the sample. The only interference encountered was chloride ion, which was easily removed by the addition of silver perchlorate to the acidified sample. Samples ranging down to 0.01 ppm F⁻ can be accurately analyzed at a rate of 10 to 15 per hour. Twenty milliliters of urine are made slightly acidic with perchloric acid in a 25-ml. volumetric flask, chloride is precipitated by the addition of excess silver perchlorate solution, a portion of the sample is filtered, and the filtrate analyzed by the Auto Analyzer. The accuracy and precision of the procedure are reported, and the results obtained on the semiautomated method are compared with results obtained by using the manual Willard-Winter distillation. There are 10 references.

-- Author's abst.

- 1072 The Air Oxidation of Monomethyl Hydrazine. E. H. Vernot, et al.
Am. Ind. Hyg. Assn. J. 28, 343-347 (July-August, 1967).

The air oxidation of monomethyl hydrazine (MMH) was examined using infrared and gas chromatographic techniques and found to be a surface catalyzed reaction obeying first order kinetics with respect to MMH. One mole of nitrogen and one-fifth mole of methane are produced for every mole of oxygen consumed. The half-life of MMH in air in a 320-ml. glass container was calculated to be 34 minutes. In a polyethylene container, the reaction appeared to be the same as in glass but occurred much more rapidly, being essentially complete in ten minutes. There are 10 references.

-- Authors' summary

- 1073 Absorption and Excretion of Mercury in Man. XI. Mercury Content of "Normal" Human Tissues. M. M. Joselow, L. J. Goldwater, and S. B. Weinberg.
Arch. Environmental Health 15, 64-66 (July, 1967).

Mercury analyses were performed on 236 samples of tissues removed at autopsy from 39 "normal" human subjects. The samples represented 12 different tissues or organs. The highest values were found in the kidneys. Age did not appear to be a factor in the mercury levels. There are 14 references.

-- Authors' summary

- 1074 Zinc Phosphide Poisoning. J. B. P. Stephenson.
Arch. Environmental Health 15, 83-88 (July, 1967).

The rodenticide zinc phosphide is toxic to man, whether swallowed, inhaled, or injected. A dose of 5 gm. has caused death; a 50 gm. dose has been survived. There have been 25 deaths (70% suicide) reported from Europe. Early symptoms after ingestion are usually nausea, vomiting, abdominal pain, chest tightness, excitement, and a feeling of coldness; breath and black stomach contents smell of phosphine. Those alive after three days recover completely. Clinicopathological findings in an English suicide from 180 gm. zinc phosphide are described. In addition to shock and signs of hepatic renal and cardiac damage, the patient had profound metabolic acidosis and hypocalcemic tetany, and excreted reducing substance in the urine. Despite thorough gastric lavage, zinc phosphide remained in the stomach postmortem. Pathogenesis of human poisoning may involve both phosphine and phosphide absorption. Treatment demands early clearance of zinc phosphide from the gut. There are 28 references.

-- Author's summary

- 1075 Direct Method for Spectrochemical Determination of Microquantities of Lead in Whole Urine. R.L. Kuntz. *Appl. Spectroscopy* 21, 178-180 (May-June, 1967).

The accuracy of a modified spectrographic method based on the Vonderkoik and Van Farow method was checked. Thirty known samples were analyzed by the above method and by the United States Public Health Service recommended method. It was found that there is a 95% confidence that the difference between the two methods is essentially zero. Five references are given. -- Public Health Eng. Absts.

- 1076 Urinary Delta-Aminolevulinic Acid (ALA) Levels in Lead Poisoning. J.R. Davis and S.L. Andelman. *Arch. Environmental Health* 15, 53-59 (July, 1967).

Disposable ion-exchange chromatographic columns have been designed for the rapid isolation of delta-aminolevulinic acid (ALA) from large numbers of urine samples in order that the determination of urinary ALA levels might be used for a screening procedure for the detection of early lead exposure in asymptomatic children. A comparison of the urinary ALA levels both in the presence and absence of coproporphyrinuria was carried out using random urine samples obtained from 200 children residing in high-incidence areas of lead poisoning in the city of Chicago. There are 17 references. -- Cond. from authors' summary

- 1077 An International Study of "Normal" Levels of Lead in Blood and Urine. L. J. Goldwater and A.W. Hoover. *Arch. Environmental Health* 15, 60-63 (July, 1967).

The results of a study of "normal" lead levels in the blood and urine of inhabitants of 15 foreign countries and the United States have been reported. A total of 829 urine specimens and 801 blood specimens have been analyzed for lead content in a central laboratory using a standard dithizone method. The "normal" level of lead in the urine may be assumed to center about a mean of 35 micrograms of lead per liter of urine. Levels of less than 65 micrograms of lead per liter of urine were found in 95% of the samples tested. A "normal" range of lead in the blood is suggested from 15 micrograms to 40 micrograms of lead per 100 ml. of blood. In 95% of the tested population, values below 50 micrograms/100 ml. of blood were found. The mean value of the present study was 17 micrograms of lead per 100 ml. of blood with a standard deviation of 11. New Guinea aborigines show average lead levels in blood comparable with those of industrialized countries. Recent investigations of the lead content of human blood (including the study reported here) do not differ greatly from those shown by older investigations during the past three decades. There are two references. -- Authors' summary

- 1078 Respiratory Exposure to Lead: Epidemiological and Experimental Dose-Response Relationships. J.R. Goldsmith and A.C. Hexter. *Science* 158, 132-134 (October 6, 1967).

Epidemiologic studies of blood lead levels in general and occupational groups show a logarithmic regression on estimated atmospheric exposure. Experimental results at the same and higher levels show a dose-response relationship which fits the same regression. The data imply that long-term increases in atmospheric lead will result in predictably higher blood lead levels in the exposed populations. -- Authors' abst.

- 1079 Treatment of Lead Intoxication. Combined Use of Peritoneal Dialysis and Edetate Calcium Disodium. H. Mehbod. *J. Am. Med. Assn.* 201, 972-974 (September 18, 1967).

Four patients suffering from lead intoxication due to consumption of illicitly distilled alcohol were given small doses of edetate calcium disodium (Calcium Disodium Versenate) and then subjected to peritoneal dialysis. The rate of deleading by dialysis exceeded significantly the rate of urinary lead excretion in each patient. In each patient, the administration of edetate calcium disodium induced an increase in the amount of lead recovered in the dialysate. Peritoneal dialysis has not been used previously in the treatment of patients with lead intoxication. Since peritoneal dialysis is a simple, safe, and readily available technique, this combined therapy is recommended under the following conditions: (1) in patients with acute lead intoxication when the speed with which deleading is accomplished is a crucial factor in the outcome; (2) in patients with lead intoxication who also have severe renal functional impairment and azotemia; and (3) in any patients with lead intoxication in whom the administration of edetate calcium disodium in high doses might be hazardous. There are 4 references.

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- 1080 The Brain in Fatal Carbon Tetrachloride Poisoning. S. A. Luse and W. G. Wood. Arch. Neurol. 17, 304-312 (September, 1967).

A case of carbon tetrachloride poisoning with hemorrhages especially in the pons and middle cerebellar peduncle, as well as renal tubular lesions and fatty liver, is presented. There were perivenous lesions in white matter of cerebrum, cerebellum, middle cerebellar peduncle, and especially the pons. Histologically perivascular hemorrhage and edema were prominent. Small spongiform zones were abundant in the transverse pontine tracts. By electron microscopy, in contradistinction to the light microscopic observations, there was no demyelination. The appearance of demyelination had been produced by edema which had pushed myelinated axons away from each other and away from the vessel wall. Edema was extracellular and also appeared to be within myelin sheaths, somewhat resembling that particular type of edema which is often found in triethyl tin poisoning.

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- 1081 Effect of Inhaled Trichloroethylene on the CNS. As Measured by Optokinetic Nystagmus. B. Kylin, et al. Arch. Environmental Health 15, 48-52 (July, 1967).

Among the numerous methods for measuring symptoms of the central nervous system (CNS) are psychometric tests, in which performance, working capacity, and power of concentration are assessed, and the measurement of various reflexes. In the study reported in this paper the object was to measure the duration and degree of the effect on the CNS of exposure to trichloroethylene vapors; a test method with optokinetic nystagmus derived by Blomberg was tried. It was intended that if the method should yield satisfactory results in the laboratory, it would be tested in field studies—that is, in group studies in industry where there is exposure to the solvent. There are 12 references.

-- Authors' introduction

- 1082 Chlorinated Hydrocarbon Pesticides in Major River Basins, 1957-65. A. W. Breidenbach, et al. Public Health Repts. 82, 139-156 (February, 1967).

The results of the synoptic pesticide surveys of 1964 and 1965 and the examination of stored carbon adsorption extracts for water years 1958 through 1965 reveal that dieldrin has dominated pesticide occurrences in all river basins since 1958. Endrin occurrence reached a maximum, particularly in the lower Mississippi River, in the fall of 1963 (the first quarter of water year 1964). Since then, endrin levels have decreased. Major fish kills in the lower Mississippi, which had previously occurred during the late fall months, were not reported in 1964 or 1965. There are 20 references.

-- Summary cond., Public Health Eng. Absts.

- 1083 Organochlorine Insecticide Residues in Wild Birds in Britain. C. H. Walker, G. A. Hamilton, and R. B. Harrison. J. Sci. Food Agr. 18, 123-129 (March, 1967).

Organochlorine insecticide residues in a wide range of wild birds and their eggs from all over Britain have been determined by gas-liquid chromatography and paper chromatography. Higher residues were found in predatory species than in omnivorous or herbivorous species. The source of the residues and their possible effect upon the birds are discussed. There are 37 references.

-- Abst. Cond., Public Health Eng. Absts.

- 1084 Cholinesterase Inhibition by Organic Phosphate Dust. Whole Blood Cholinesterase Inhibition in Vitro by an Organic Phosphate Anthelmintic. G. R. Simpson. Arch. Environmental Health 15, 70-71 (July, 1967).

Due to atmospheric contamination in the laboratory by anticholinesterase dusts, inconsistent cholinesterase values, particularly low ones, were recorded. This was found due to in vitro cholinesterase inhibition of blood samples by the material being sampled there. There are 5 references.

-- Author's summary

03122691

- 1085 Comparison of Analytical Methods for Determination of Dieldrin (HEOD) in Blood. J. Robinson, A. Richardson, and J.M. Davies. Arch. Environmental Health 15, 67-69 (July, 1967).

The concentrations of dieldrin (HEOD) in samples of blood have been determined by two methods, acetone extraction and hexane extraction. The results obtained by the latter method are only 65% to 70% of those by the former method and the reproducibility of the acetone technique is better than that of the hexane technique. The coefficients of variation are acetone method, 0.9% and hexane method, 16.9%. The results of the two methods are significantly correlated over a wide range of concentrations of HEOD in blood. This constant relationship may arise from either a simple partition process or the formation of adsorption complexes. As the activation energy for physical adsorption is small, it is considered that the concentrations found by both methods will be correlated with the pharmacological effects of HEOD in blood. There are 5 references.

-- Authors' summary

- 1086 Lindane and Hematologic Reactions. Irma West. Arch. Environmental Health 15, 97-101 (July, 1967).

From a number of independent sources throughout the world circumstantial evidence has been accumulating which places lindane, a chlorinated hydrocarbon pesticide, suspect in the cause of serious blood dyscrasias, primarily a plastic anemia. Cases have been reported in other countries as well as in the United States. Six cases from California are discussed where the exposure to lindane came either from thermal generators designed to continuously disperse lindane vapor into the indoor air to control flying insects, or from lindane vaporized periodically into the household by pest control operators. During the past 15 years, widely publicized statements from medical and public health agencies have recommended against the use of lindane vaporizers particularly in the home. Research is urgently needed to determine if there is a cause and effect relationship between exposure to lindane and adverse effects on the bone marrow. Regardless of whether or not a cause and effect relationship exists, the burden of proof, particularly involving a fatal disease, should not rest upon the public. Practical and flexible administrative provisions which can take heed of widespread recommendations from medical and public health agencies should be available so that further exposure of the public to a chemical can be curtailed promptly until research can satisfactorily answer important health questions which have arisen. There are 31 references.

-- Cond. from author's summary

- 1087 Poisoning by the Insecticide Chlordane. R. Barnes. Med. J. Australia 1, 972-973 (May 13, 1967).

Jacksonian and grand mal convulsions following the use of chlordane as a soil insecticide are described. Although the nurseryman used extreme care in mixing and applying the chlordane, he handled soil and plants that had been sprayed. There are 15 references.

-- Public Health Eng. Absts.

- 1088 Cancer-Promoting Effects of Phenols in Tea. H.E. Kaiser. Cancer 20, 614-616 (May, 1967).

With spectroscopic and gas chromatographic methods, phenols and dimethylphenols were found in the phenolic fraction of black tea. An initial application of 1% acetone solution of 3,4-benzopyrene to the neck region of each of 15 young Swiss mice was followed by paintings of tea to the neck region on alternate days for 55 applications. A control group of 15 similar mice received only the single benzopyrene painting. The control mice developed no skin lesions, but all of the mice treated with benzopyrene plus tea demonstrated various stages of cancer development. There are 13 references.

-- Abst. cond., Public Health Eng. Absts.

INDUSTRIAL DUSTS

- 1089 Experimental Silicosis. The "Atypical" Reaction in the Syrian Hamster. P. Gross, A.J. de Villiers, and R.T.P. deTreville. Arch. Pathol. 84, 87-94 (July, 1967). (Reprints available from IHR).

Silicosis in hamsters, produced by intratracheal injection of quartz dust, differs from silicosis in other species in several important respects: (1) the predominant lesion in hamsters is a

diffuse consolidation of alveolar tissue with few nodules; (2) quartz dust is diffusely distributed in the consolidated alveoli, but is also heavily concentrated in the scattered nodules; (3) the stroma of the pulmonary silicotic inflammation is argyrophilic and does not convert into collagen; and (4) silicotic nodules in the satellite lymph nodes contain scanty argyrophilic stroma and no collagen in spite of a high quartz content. The "atypicality" of silicosis in hamsters is attributed to a less effective alveolar clearance mechanism and a different tissue reactivity to quartz dust than exists in other animal species.

-- Authors' abst.

- 1090 Leeward Deposition of Particles on Cylinders From Moving Aerosols. G. Asset and T.G. Hutchins. *Am. Ind. Hyg. Assn. J.* 28, 348-353 (July-August, 1967).

A study of leeward deposition of moving aerosols on cylinders was conducted by exposing glass rods of various dimensions to aerosols in a wind tunnel. Particles of several size ranges were carried to the target at three different wind velocities. For each exposure, the ratio, N_l/N_w , between the number of particles counted on the leeward side of the cylinder and the number counted over an equal area on the windward side was calculated, as was the impaction parameter, K , corresponding to the mean particle size. For $K > 0.18$, $N_l/N_w = 0$; for $K < 0.085$, $1.7\% < N_l/N_w < 131\%$; and for $0.085 < K < 0.18$, $0.3\% < N_l/N_w < 1.7\%$. When $K < 0.085$, N_l/N_w did not vary with particle size, wind velocity, or cylinder diameter. However, when $K < 0.085$, the ratio did vary, generally showing an increase with decreasing particle size and wind velocity but with increasing cylinder size. There are 9 references.

-- Authors' abst.

- 1091 Hydroscopic Effects on Weight Determinations of Particulates Collected on Glass-Fiber Filters. G.P. Tierney and W.D. Conner. *Am. Ind. Hyg. Assn. J.* 28, 363-365 (July-August, 1967).

The effect of relative humidity on the tare weight of glass-fiber filters was insignificant, but the effect on collected particulates was significant when the humidity exceeded 55%. When particulate samples were weighed at relative humidities below 55%, weight variation did not exceed 1%.

-- Authors' abst.

- 1092 Dust Measurement in Plants With Asbestos Processing Machinery. A. M. Kesting. *Staub Reinhaltung der Luft (English Ed.)* 26, 14-16 (October, 1966).

Systematic measurements of dust concentration began about 10 years ago in the asbestos processing branch of the textile industry. Long-term observations have given basic data for dust concentrations occurring in the individual processing stages. Statistical evaluation of these dust measurements shows that there has been a continuous decrease in dangerous dust concentration.

-- English summary cond., Public Health Eng. Absts.

- 1093 Evaluation and Assessment of the Dust Measurements in Asbestos Plants of the Textile Industry. E. Walter. *Staub Reinhaltung der Luft (English Ed.)* 26, 16-19 (October, 1966).

The konimeter measurements in asbestos plants of the textile industry and their classification according to the microphotographic tests give an accurate picture of dust concentration. Gravimetric measurements give an average value; they can also be used for an assessment by coefficients. There is a limited relationship between the values measured by filtering instruments and those obtained by konimeter. This is particularly valid when the dust concentration lies below the danger limit. There are 4 references.

-- Author's abst., Public Health Eng. Absts.

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 1094 Nephropathy Associated With Heat Stress and Exercise. R. W. Schrier. *Ann. Internal Med.* 67, 356-376 (August, 1967).

Eight cases of acute renal failure associated with heat stress and physical exercise occurred in recruits participating in their initial two months of basic training. Features of the clinical course were hypercatabolism, muscle damage, prolonged periods of anuria, widespread system involvement, and persistent fevers without evidence of infection. Hypercatabolism was evidenced by the need for peritoneal dialyses and cation exchange resins to control the azotemia.

and hyperkalemia. Diffuse muscle involvement in three fatal cases included vacuolization, degeneration, and extensive rhabdomyolysis. Elevated serum enzymes including aldolase, SGOT, and lactic dehydrogenase which occurred concomitantly with normal liver function tests also suggested diffuse muscle involvement. There were prolonged periods of anuria in five of the eight cases; postrenal obstruction was excluded as the cause as were persistent hypotension and dehydration. CNS, hematological, hepatic, cardiovascular, and gastrointestinal complications were also associated with the acute renal failure. Pathological findings revealed enlarged kidneys without histological evidence of glomerular alterations or tubular necrosis. Consistent findings were pigmented casts in the lumens of the distal tubules, collecting ducts, and thin limbs of the loops of Henle. Dehydration, vascular collapse, hyperpyrexia, and pigmenturia were all considered to play varying etiological roles.

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

RADIOACTIVITY AND X-RADIATION

- 1095 Radiation Death From Cardiovascular Shock Following a Criticality Accident. H. Fanger and C.C. Lushbaugh. Arch. Pathol. 83, 446-460 (May, 1967).

Two similar case histories of nuclear radiation victims reflect radiation-induced hypotension, vascular damage, shock and death within two days. Pathologic changes represent a lethal subsyndrome of the acute radiation syndrome, occurring in the dosage range between the acute gastrointestinal and neurologic subsyndromes. Because meningeal and cortical changes occur as part of the vascular damage, terminal neurologic symptoms occur that lead to the suspicion of neurologic damage. Only minimal neuronal damage and glial reaction were present, however, and death apparently resulted from increased intracranial pressure, cerebral anoxia, cardiac failure, and massive peripheral edema. There are 22 references.-- Public Health Eng. Absts.

- 1096 Thyroid I-131 Burdens in Medical and Paramedical Personnel. M. Blum and A. Liuzzi. J. Am. Med. Assn. 200, 992-994 (June 12, 1967).

Elevated thyroid I-131 burdens were observed in technicians, physicists, physicians, and nurses who were exposed to radioactive iodine as part of their clinical duties. The levels varied greatly among the individuals in each group; the variance probably is related to working conditions or habits. The radiation doses inferred from measured burdens were well below the limits recommended by the Federal Radiation Council. There are 9 references.

-- Summary cond., Public Health Eng. Absts.

- 1097 A Study to Determine the Effects of Increasing the Exchange Interval for Personnel Dosimetry Films. R.O. Campbell and P.K. Lovell. Am. Ind. Hyg. Assn. J. 28, 354-356 (July-Aug. 1967).

A study was conducted to determine the effects of extending the interval between the exchange of personnel dosimetry films from one month to three months. Unexposed and pre-exposed films from three exposure levels were stored in controlled and uncontrolled environments. A third of these films was removed and processed after one, two, and three months. Reported doses of the pre-exposed films were within the statistical variation ($\pm 15\%$) of the reported doses of films processed within four days after exposure. Unexposed films showed no fogging. Five references are given.

-- Authors' abst.

ENVIRONMENTAL MEASUREMENTS

- 1098 Water Analysis by Atomic Absorption and Flame Emission Spectroscopy. F.I. Grunder and E.A. Boettner. Am. Ind. Hyg. Assn. J. 28, 391-394 (July-August, 1967).

Several elements (Ca, Mg, Na, K, Fe, Mn, Cu, Zn, Pb) were determined in water samples by means of atomic absorption and flame emission techniques. The preparation of the samples, the analytical method, the sensitivities, and the analytical precision are presented. The analytical precision was calculated on the basis of a sizable amount of statistical data and exemplifies the role of an analytical determination of such factors as the hollow cathode source, the flame, and the detection system.

-- Authors' abst.

- 1099 Determinations of Microgram Quantities of Diethanolamine, 2-Methylaminoethanol, and 2-Diethylaminoethanol in Air. F. A. Miller, et al.
Am. Ind. Hyg. Assn. J. 28, 330-334 (July-August, 1967).

Alkanolamines are in wide use in industry, especially in the chemical and pharmaceutical industries as intermediates for the production of emulsifiers, detergents, solubilizers, cosmetics, drugs, and textile finishing agents. Despite this wide use, when the authors investigated three specific alkanolamines—diethanolamine, 2-methylaminoethanol, and 2-diethylaminoethanol—they could find few references to such factors as human tolerance to their vapors, odor threshold data, or specific analytical techniques for determining their vapors in air. This report concentrates on the last of these areas, and details methods for determining concentrations of these amine vapors in air. Two analytical techniques are described which have been adapted to industrial hygiene purposes for determining microgram quantities of airborne vapors of diethanolamine, 2-methylaminoethanol, and 2-diethylaminoethanol. The first two of these materials are secondary amines, and are oxidized with potassium dichromate; the residual unreduced dichromate is then reacted with 1, 5-diphenylcarbohydrazide to form a pink color which is determined spectrophotometrically. The 2-diethylaminoethanol, a tertiary amine, is collected in water, extracted with ethylene dichloride, and then reacted with methyl orange to form a complex which breaks up in acid solution to again produce a color which may be read on a spectrophotometer. There are 6 references.

- 1100 The Use of Silica Gel in Source Testing. M. Feldstein, S. Balestrieri, and D.A. Levaggi.
Am. Ind. Hyg. Assn. J. 28, 381-385 (July-August, 1967).

This is a study of the adsorption of a large group of solvent vapors upon silica gel and their subsequent quantitative desorption. Esters, ketones, aromatic and aliphatic hydrocarbons, and halogenated hydrocarbons were among those studied. Except for certain low-molecular-weight hydrocarbons, the silica gel was extremely efficient for adsorbing organic solvents. In general, dimethylsulfoxide proved ideal for elution of adsorbed materials and for subsequent by gas chromatography. It could not be used for hydrocarbon solvent mixtures or for higher boiling solvents. In these cases, carbon disulfide, alone or with water, was used for desorption. There are 9 references.

-- Authors' abst.

- 1101 Field Measurement of Ultraviolet, Infrared, and Microwave Energies. J.H. Fanney, Jr., and C.H. Powell. Am. Ind. Hyg. Assn. J. 28, 335-342 (July-August, 1967).

The industrial hygienist has for some time been aware of the possible hazards which exist from the energies in the nonionizing portion of the electromagnetic spectrum. Potential sources of these radiations and instrumentation available for field measurement are reviewed. The instruments by categorical types, their advantages, disadvantages, and specificity for various portions of the spectrum, as well as the interpretation of their responses are discussed. Field survey techniques for specific sources and/or energies are also presented. The needs are stated for continuing research on instrumentation with recommendations related to spectral response and reliability. There are 22 references.

-- Authors' abst.

- 1102 Laser Action in Human Breath and Its Use for Monitoring the Carbon Dioxide Content of Air. D.J. Hunt. J. Sci. Instr. 44, 408-410 (May, 1967).

Laser action has been obtained in exhaled human breath at reduced pressure. The system, which is basically a nitrogen-carbon dioxide laser, has been used to determine the CO₂ content of exhaled human breath over the range 1 to 6% CO₂. Such measurements might be useful in the design of breathing apparatus or in monitoring CO₂ content of air in restricted environments. There are 11 references.

-- Public Health Eng. Absts.

COMMUNITY AIR HYGIENE

- 1103 Industry and the Pollution Problem. A. M. Bueche.
Environ. Sci. Technol. 1, 24-30 (January, 1967).

Industry has the motivation, obligation, and the needed skills and facilities to contribute to the solution of pollution problems at both the local and the national level. Government's role

could be to help define the problem and to coordinate and encourage industry's efforts. One figure for the cost of catching up in pollution abatement, and keeping waste management up to date will total \$100 million over the next 10-20 years. The chemical industry alone is spending 2-5% of its total capital investment for pollution control facilities. Improved energy conversion and energy storage systems are indicated. Two-thirds of our air problems come from the internal combustion engine. In Paris 50% of the motorists are on the threshold of intoxication from carbon monoxide. Although fuel cell automobiles are economically out of the question today, they are promising for both long-range research and immediate development work. Battery-operated vehicles would be clean themselves, but the methods to provide the energy to charge the batteries can be sources of pollution. Industry itself should assume the major responsibility for the development of hardware and systems to monitor, prevent, and remove pollutants.

-- APCA Absts.

- 1104 Observations From a Ten-Year Study of Pollution at a Site in the City of London. B. T. Commier and R. E. Waller. *Atm. Environ.* 1, 49-68 (January, 1967).

As part of an extensive study of the effects of air pollution on health, measurements of pollution have been made at a site in the City of London for more than ten years. The results of daily measurements of the concentration of smoke and sulfur dioxide made throughout that period and of more frequent measurements made during episodes of high pollution are reported. These show a reduction in the annual mean and peak concentrations of smoke during the ten year period, but there have not been any significant changes in the concentrations of sulfur dioxide. Occasional measurements of a wide range of other pollutants are also reported and results from a series of measurements of polycyclic aromatic hydrocarbons indicate a decline in the concentration of this potentially carcinogenic component.

-- APCA Absts.

- 1105 Industrial Emissions of Carbon Dioxide in the United States: A Projection. F. A. Rohrman, B. J. Steigerwald, and J. H. Ludwig. *Science* 156, 931-932 (May 19, 1967).

Estimates of the escalating uses of fossil fuels in the United States, especially for the generation of electric power and in the internal combustion engine, show that by the year 2000 emissions will have increased approximately eighteen-fold from 1890. In the period 1965 to 1985, an emission-rate increase of around 4.0% per year compounded is expected. The expected intrusion and expansion of nuclear power will tend to lower the rates of increase of emission after 1985. Increases in emission rates in the rest of the world will probably equal or exceed the values projected for the United States. There are 7 references.

-- Abst. Cond., Public Health Eng. Absts.

- 1106 Estimation of Local Diffusion of Pollutants From a Chimney: A Prototype Study Employing an Activated Tracer. P. S. Rummerfield, J. Cholak, and J. Kereiakes. *Am. Ind. Hyg. Assn. J.* 28, 366-371 (July-August, 1967).

From wind tunnel studies, Halitsky has developed models for prediction of pollutant concentrations around buildings from short vents. His equations (with some modification), evaluated for outdoor conditions, were found to give accurate predictions. His model for prediction within the building cavity and two other models, applicable beyond the cavity, were evaluated. A tracer was burned in an incinerator. Stack emissions were isokinetically collected on filter papers. Field samples around the building were also collected on filter papers. The samples were activated in a nuclear reactor. The tracer was then separated and counted. In 13 tests (114 samples) most actual versus predicted dilutions differed by less than a factor of 3. In only one case was the difference greater than a factor of 7. There are 6 references.

-- Authors' abst.

- 1107 Eye Irritation as a Biological Indicator of Photochemical Reactions in the Atmosphere. L. G. Wayne. *Atm. Environ.* 1, 97-104 (March, 1967).

Studies involving the quantitation of eye irritation produced by experimental exposure of humans to synthetic atmospheres are discussed. The principal methods used are panel measurements of intensity, threshold, or response delay. Advantages and difficulties of each method are reviewed, as well as characteristics of the data generated and appropriate means of manipulating the data. Evidence regarding the possible chemical identity of irritants in photochemical smog is discussed, leading to the conclusion that not all observed eye irritation is

accounted for by additive effect of formaldehyde, acrolein, and peroxyacyl nitrates. Implications of the findings for air pollution control policies are considered. As one of the undesirable manifestations of photochemical smog, eye irritation has been the subject of a number of studies in recent years. This article reviews several of these studies with particular reference to those aspects relevant to air pollution research and air pollution control policy.

-- Author's abst., APCA Absts.

- 1108 Climate Modification by Atmospheric Aerosols. R. A. McCormick and J. H. Ludwig. Science 156, 1358-1359 (June 9, 1967).

Theoretical considerations and empirical evidence indicate that atmospheric turbidity, a function of aerosol loading, is an important factor in the heat balance of the earth-atmosphere system. Turbidity increase over the past few decades may be primarily responsible for the decrease in worldwide air temperatures since the 1940's. There are 14 references.

-- Authors' abst., Public Health Eng. Absts.

- 1109 A New Instrument for Evaluating the Visual Quality of Air. N. C. Ahlquist and R. J. Charlson. J. Air Poll. Control Assn. 17, 467-469 (July, 1967).

Any device for assessing the visual quality of air must necessarily have an extremely high sensitivity since, at time, the Rayleigh scattering of air molecules is the determining factor. The integrating nephelometer of Brewer and Beuttell has been adapted for air quality measurement. It records the volume scattering coefficient and was reliable in over a month of continuous operation. The results may be interpreted in terms of visual range; if so the inherent noise in the system corresponds to more than 500 miles visual range with a 100-second response time. The low cost, simplicity, and sensitivity of the device make it appear useful for rapid evaluation of visual air quality. The design of the instrument is presented, including both the optical and electronic components. The results of operation of the instruments in Seattle during days of moderate air pollution are used to illustrate the utility of the device.

-- Authors' abst.

- 1110 Methodology in Air Pollution Studies Using Irradiation Chambers. B. Dimitriadis. J. Air Poll. Control Assn. 17, 460-466 (July, 1967).

Experimentation in large irradiation chambers has been useful in providing insight into the chemistry of the photochemical smog formation problem. Initial efforts to reproduce the atmospheric phenomena artificially at controllable scale were successful in that gross atmospheric smog symptoms were observed in irradiation chambers. However, as the experimentation and evidence produced were becoming more elaborate, the question arose as to how much one could rely on chemical data in understanding and interpreting atmospheric phenomena. The question becomes highly pertinent in view of the difference in concentration levels between atmosphere and chamber work. This issue was discussed during recent American Chemical Society meetings, and the conclusions from presentations and discussions were as follows: (1) There is qualitative agreement between chamber data and atmospheric data wherever comparison is feasible. (2) There is need for more precise chamber work at concentration levels more nearly equal to those in the atmosphere. Experimentation in chambers under typical atmospheric conditions presents some special problems associated with the chamber design and chemical analysis. Chamber methodology has been the focus of considerable research effort, and it appears to be an important factor affecting further progress in air pollution research. This paper describes methods and techniques used at the Bartlesville Petroleum Research Center. There are 12 references.

-- Author's abst.

- 1111 How to Prevent SO₂ Emission. J. H. Field, R. C. Kurtzrock, and D. H. McCrea. Chem. Eng. 74, 158-160 (June 19, 1967).

A new absorption process combats air pollution by removing sulfur oxides from flue gases of coal-fired electrical power plants. The process consists of contacting the flue gases against an alkalized alumina absorbent that reacts with SO₂, thus removing it from the steam gas going to the atmosphere.

-- Public Health Eng. Absts.

03122697

- 1112 How Computers Aid Air Management. R.I. Larsen.
J. Air Poll. Control Assn. 17, 439-445 (July, 1967).

The data system unit operations (sense, convert, encode, transmit, write, read, translate, sort, store, retrieve and compute) are described. Examples are cited of how these unit operations have been combined into various operating systems to aid in accomplishing the dozen steps involved in air management. There are 25 references. -- Author's abst.

- 1113 Atmospheric Pollution Considerations Affecting the Ultimate Capacity of a Thermal-Electric Power Plant Site. Technical Information Report From the TI-5 Committee. J.F. McLaughlin, J. Air Poll. Control Assn. 17, 470-473 (July, 1967).

The power plant designer today has the tools at hand which enable him to predict with an adequate degree of accuracy the effect of different stack heights on ground level concentrations of the gaseous pollutants emitted from power plant stacks. Use of tall stacks will make it possible in most cases to build larger power plants at any particular site than are in service now and still operate them satisfactorily from the standpoint of air pollution. On the other hand, atmospheric pollution considerations may make it necessary at some sites to put a finite limitation on the maximum capacity that can be installed. -- Author's abst.

- 1114 Estimation of Smog Effects in the Hydrocarbon-Nitric Oxide System. J.C. Romanovsky, R.M. Ingels, and R.J. Gordon. J. Air Poll. Control Assn. 17, 454-459 (July, 1967).

Hydrocarbon components (propylene, simulated auto exhaust, or authentic auto exhaust) were irradiated in the presence of nitric oxide in large chambers instrumented for measurements of numerous variables. Eye irritation was measured using a selected panel of human subjects. The various dependent variables are presented as functions of the reactant concentrations by means of contour diagrams derived by computer treatment. The effect of "hydrocarbon" and nitric oxide levels on smog effects are discussed; the observed relationships between end effects and reaction rates are considered. The study simulated the effects of varying degrees of vehicular emissions control over one or both reactants and has a bearing on the establishment of vehicle emission standards in California. There are 9 references. -- Authors' abst.

- 1115 The Influence of Improved Mixture Quality on Engine Exhaust Emissions and Performance. J.A. Robison and W.M. Brehob. J. Air Poll. Control Assn. 17, 446-453 (July, 1967).

A large, steam-heated, fuel vaporization tank was utilized as a carburetor in multicylinder engine testing at steady-state operating conditions. In comparison to normal carburetion, the tank provided improved air-fuel mixture quality, i.e., completely vaporized fuel, thoroughly mixed with air, and at elevated temperatures. Although not a practical piece of engine hardware, the tank provided a means of determining the extent of gains to be made with improved mixture quality. Improved mixture quality produced slight reductions in rich mixture hydrocarbon and carbon monoxide concentrations but did not reduce the minimum emissions of these two exhaust contaminants. Minimum fuel consumption was similarly unaffected by improved mixture quality. The most important benefit of improved mixture quality was derived from improved geometric and cyclic fuel distribution—a substantial extension of the misfire lean limit. The significance of lean limit operation and its relationship to reduced exhaust contaminants is discussed in detail. Six references are given. -- Authors' abst.

- 1116 Motor Vehicle Pollution in California. J.A. Maga, H. Wong-Woo, and M.G. Mason. J. Air Poll. Control Assn. 17, 435-438 (July, 1967).

A review of all the factors involved indicates that there is no simple and inexpensive solution to the complex problem of motor vehicle created air pollution. The problem has many aspects. It is legal, political, social, economical, and technological. The final solution must incorporate considerations for all these aspects. The motor vehicle control program in California has reduced emissions of hydrocarbons and carbon monoxide into the atmosphere. In spite of the increasing number of vehicles there has been a reversal in emission trends for the first time. If the goal of prewar air quality is to be achieved, there must be a high degree of emission control. Consequently, the program requires that effective systems be available, and that virtually no cars be exempt. Lack of efficient control of some emissions, large numbers of

cars uncontrolled, and deterioration in efficiency of control systems will lead to air quality poorer than that desired. Under the present program, which is oriented toward the installation of control systems on new cars, the reduction of contaminants emanating from motor vehicles will be gradual. In order to accomplish a rapid improvement, within a few years, exhaust emissions from all cars (new and used) must be controlled.

-- Cond. from authors' summary

- 1117 A Study on the Epidemiology of Asthma in Children in Philadelphia. L.S. Girsh, et al. *J. Allergy* 39, 347-357 (June, 1967).

Occurrence of stable weather conditions with stagnant air over Philadelphia seems to correlate with peak incidences of bronchial asthma. There are indications that the increased air pollution associated with these weather conditions is a causative factor. An asthma index may be derived from meteorologic and air pollution data to help predict such peak incidences. There are 11 references. -- Authors' abst., Public Health Eng. Absts.

- 1118 Carcinogenicity of Organic Particulate Pollutants in Urban Air After Administration of Trace Quantities to Neonatal Mice. S.S. Epstein, et al. *Nature* 212, 1305-1307 (Dec. 17, 1966).

To permit rapid and large scale screening of organic atmospheric pollutants, neonatal mice were used in a sensitive bioassay to directly estimate the carcinogenicity of all components in organic extracts of the particulate pollutants. There are 23 references.

-- Public Health Eng. Absts.

- 1119 Control of Gaseous Fluoride Emissions. A.J. Teller. *Chem. Eng. Progr.* 63, 75-79 (March, 1967).

Fluoride effluents from industrial operations vary in both composition and concentration, reflective of the process involved. The proper design and selection of equipment for recovery of a specific chemical constituent may vary as a function of the process source.

-- Author's abst., Public Health Eng. Absts.

ACCIDENTS AND PREVENTION

- 1120 Influence of Drugs and Alcohol on Accidents. J. im Obersteg and J. Baumler. *Schewiz. med. Wochschr.* 97, 1039-1041 (August 12, 1967).

This study concerns 328 patients transferred to a surgical department following accidents. From each patient blood samples were taken for determination of blood alcohol and urine samples for detection of possible drug intake. Blood samples were alcohol-positive in 19% (24% of traffic accidents and 15% of other occupational and non-occupational accidents). In approximately two thirds of traffic accidents the blood alcohol concentration was over 0.8 per 1,000, whereas drug intake before accidents was demonstrated in 4% of patients. In contrast to alcohol concentration, no specific relationship of drug intake to the three accident groups was apparent. Alcohol was a much more important factor than drugs in the various kinds of accidents considered. -- J. Am. Med. Assn. References & Reviews

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