

IN RE: ABRAMS  
November 1992



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# *Industrial Hygiene Digest*

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL

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DR. HENRY F. SMYTH, JR.

IHF ADVISORY FELLOW APPOINTEE



Dr. Henry F. Smyth, Jr., Professor of Toxicology in the Department of Occupational Health, University of Pittsburgh Graduate School of Public Health has been appointed Advisory Fellow of Mellon Institute and will assist Industrial Hygiene Foundation in chemical-toxicological research matters.

Dr. Smyth was a member of the Foundation's Chemical-Toxicological Committee from 1946-1959 (Chairman 1946-1952) and a member of the Board of Trustees from 1964-1967. For thirty years, he was an Administrative Fellow of Mellon Institute directing Union Carbide's Chemical Hygiene Fellowship.

Dr. Smyth received a B.S. in Chemical Engineering and Ph.D. in Medical Sciences from the University of Pennsylvania. Prior to joining the staff of Mellon Institute in 1937, he worked for the Pennsylvania Department of Labor, the National Safety Council, and was a partner in a consulting service in industrial hygiene. He has held academic appointments as an instructor in toxicology at the University of Pennsylvania School of Medicine and at the University of Pittsburgh Graduate School of Public Health Department of Occupational Health. Dr. Smyth is registered as a Professional (Chemical) Engineer in Pennsylvania. He is author of over 70 papers in industrial hygiene and experimental toxicology and has contributed to several texts.

A member of numerous professional and technical societies, Dr. Smyth has held offices of President, Director and Executive Secretary of the American Industrial Hygiene Association at various times. In 1960 he helped found The American Board of Industrial Hygiene and since then has served as its Secretary-Treasurer.

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INDUSTRIAL HYGIENE DIGEST  
Literature and News

NEWS ITEMS

911 "Chemical Mace" called "Gentle Persuader."

A new device, marketed only to police for use when threatened or in subduing those resisting arrest, has been introduced into widespread use in the United States in 1966-67. It is not our intention to endorse this new product, but to alert Digest Readers of its use. Industrial health personnel may be asked questions concerning its relative health hazards in comparison with other "personal protection" weapons using tear gas. Phenylchloromethylketone is the tear gas used in MK II or IV "Chemical Mace" aerosol cans. These cans will squirt a tightly patterned spray of droplets a distance of about eight feet. The cans contain sufficient spray for up to 400 one-second bursts. By contrast, the pen-type tear gas device, which is available to the public, (especially to women who carry it for personal protection) uses a powder propellant or primer explosive to send a single blast of tear gas particles. The resulting cloud is poorly controlled directionally and may be blown back into the face of the user by the wind. There is no "repeat" capability, and the person using the device, having had a false sense of security may now be in a more precarious situation than if she had relied on an "old fashioned hat pin." The person against whom the tear gas gun was used may sustain eye injury from wadding or propellant. If the skin should be penetrated, for example by accidental discharge of the device into the hand, serious systemic toxicity is possible from the chemicals so injected. Other devices expelling a hair-spray like mist of tear gas particles from a pressure-charged container, suffer from lack of directional control of spray and tend to contaminate entire areas, rather than affecting threatening or disorderly individuals. In addition, experience has shown such devices to have shelf or holster leakage as well as irregular flow operation, both due to orifice plugging. Still other devices on the market expel, from a freon or CO<sub>2</sub> charged container, streams of liquids containing pepper compounds, ammonia, and other eye and cough-producing irritants. Useful only at close range, they have varying degrees of toxicity but ordinarily unless projected so that they hit the eyes they do not act quickly enough to be effective and may only serve to make a bad situation worse. The Chemical Mace, on the other hand, is instantly effective if only a small per cent of the droplet burst pattern strikes the face, causing intense burning and tearing. A combination of the local burning sensation of the activating compound and concomitant tear gas liberation acts synergistically to temporarily distract, disable and incapacitate for five or more minutes, long enough for all normal defensive or tactical police action to take place. While other devices are available to the public, Chemical Mace is being distributed solely for use by law officers. Numerous instances of the effective use of this new police weapon, also termed the "gentle persuader", have been cited in the press in different parts of the United States during the past year.

Abstracted from a reprint on "The Chemical Mace" by Col. Rex Applegate USA (Ret) from the National Sheriff, May-June 1966.

Editor's Note: Information recently supplied to Industrial Hygiene Foundation states that acute exposure of eyes for 1, 2 & 5 seconds to aerosol ejected from MK IV type "A" Chemical Mace at a distance of six feet produced no detectable conjunctival irritation or corneal damage. The chemical formulation tested in eyes of rabbits, monkeys, and man is not considered to be an eye irritant under the Federal Hazardous Substances Labeling Act. Reports of these toxicity studies, performed in the Hazleton Laboratories Inc., Falls Church, Virginia, are available to police surgeons. Other qualified health service personnel may also be able to obtain such information, however, upon request from the General Ordnance Equipment Corporation, 233 Spahr St., Pittsburgh, Pennsylvania 15232.

\*Registered Trade Mark of General Ordnance Equipment Corporation.

912 Society of Toxicology.

The annual scientific meeting of the Society of Toxicology will be held in Washington, D.C., on March 4, 5, and 6, 1968. Anyone interested may attend. Papers for the 1968 meeting may be

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submitted or must be sponsored by members of the society. At the annual meeting held in Atlanta, Georgia, in March, 1967, 87 scientific papers in all phases of toxicology were presented. Abstracts of these appeared in the journal of the society, Toxicology and Applied Pharmacology, Vol. 10, pages 378-411, 1967. Additional information about the meeting may be obtained from the Secretary: Dr. Joseph F. Borzelleca, Dept. of Pharmacology, Medical College of Virginia, Richmond, Virginia 23219.

913 The Mental Health Digest: A Prospectus.

The Mental Health Digest is a new publication of the National Institute of Mental Health. For several years, the Institute has seen the need develop for an information bulletin on current developments in mental health. The establishment of the National Institute of Mental Health as a bureau of the U.S. Public Health Service to carry out the total mental health program of the Service also underlies the need for this innovative publication. The National Clearinghouse for Mental Health Information—the scientific information center of the Institute—serves as the publisher of Mental Health Digest. The Clearinghouse is responsible for the collection, storage, retrieval, and dissemination of information from scientific and professional literature, mental health programs, and all other pertinent sources. It will make this information available through a pattern of services. The Digest is an integral part of this pattern. The Digest is intended for individuals working in or concerned with the field of mental health—the research scientist, the practicing psychiatrist or psychologist, nurse, or social worker, the administrator of mental health programs, the trained mental health professional, and other persons professionally interested in mental health—whatever their disciplines may be. The first few issues will be published on an experimental basis and will be distributed gratis to professional personnel working in or concerned with the field of mental health. Thereafter, it is expected that the Digest will be available on subscription from the Superintendent of Documents of the U.S. Government Printing Office. Information about subscriptions will be distributed later.

914 AMA Surveys Industrial Health Hazards.

More than 5,000 physicians are now participating in the American Medical Association's nationwide survey to learn about industrial worker's adverse reactions to hazardous materials and sources of energy. The survey may result in a national registry of those adverse reactions and suggest heretofore undetected health hazards. -- Natl. Safety News 96, 6 (Sept. 1967).

915 X-Ray Danger Debated.

Exposure to ionizing radiation from medical diagnosis is far greater than from all other man-made sources and is causing between 3,000 and 30,000 deaths a year, the Senate was told by Karl Z. Morgan, Director of the Oak Ridge National Laboratory's Health Physics Division. However, Joseph D. Calhoun, M.D., Chairman of the American College of Radiology, said there is no known instance in which a routine x-ray examination was fatal to a patient because of the radiation exposure involved. -- AMA News 10, 1 (Sept. 11, 1967).

916 Phosgene—It's Deadly.

Solvents containing chlorine, such as carbon tetrachloride, chloroform, trichloroethylene, and perchloroethylene have many uses and varying levels of toxicity. The dispersion of that type of material into the atmosphere must be controlled according to the toxicity level of the individual solvent. In addition to the normal toxicity of those solvents (known as chlorinated hydrocarbons) there is the hazard of generating phosgene—a deadly material, generated by exposing even small quantities of the chlorinated hydrocarbons to flames or hot metal surfaces. When using such chemicals, special attention must be given to possible sources of flame or heat. Before welding tanks, for example, properly protected workmen must clean out all residual solvent, and apply exhaust ventilation. -- Natl. Safety News 96, 6 (Sept. 1967).

917 New Fire Cause?

The very popular and relatively new rechargeable storage batteries for flashlights, electric razors, and many other small tools and appliances may be a potential hazard. Many of the units offered for sale carry the Underwriters' Laboratories marker (or the seal of other approved testing facilities), indicating that they have been tested and probably will not be a source of ignition. When a unit carries no seal, however, it may be subject to malfunction and pos-

sible fire. With some, this warning is given: "If a battery will no longer charge, do not discard it in fire; it may explode." If one of the units is plugged into a socket, and left overnight to charge, and if the charger malfunctions and explodes, the evidence is scattered. Subsequent location of the source of ignition is next to impossible.

-- Natl. Safety News 96, 10 (Sept. 1967).

918 Pesticide Intake.

A two-year survey conducted in 25 cities by the Food and Drug Administration indicated that the daily intake of pesticide chemicals in a well-balanced American diet is "substantially below" acceptable "safe" limits.

-- AMA News 10, 1 (Sept. 11, 1967).

919 Laser to Help Align Structures.

Lockheed-Georgia is using the light of a laser to help align structures in building the Air Force's C-5A, the world's largest aircraft, at Marietta, Ga. The laser beam can detect errors of less than 10 microinches and has greater consistency in measurement than previously used optical methods. Twin laser beams are used much like a conventional alignment telescope to align such equipment as small precision dies and milling machines which handle 40-foot stringers for the fuselage. Lockheed's laser system compensates for variations in atmospheric pressure which could affect the velocity of light.

-- Chem. Eng. News 45, 35 (Sept. 4, 1967).

### COMING EVENTS

- |     |                |                                                                                                                              |
|-----|----------------|------------------------------------------------------------------------------------------------------------------------------|
| 920 | Nov. 1- 3      | American Society of Tropical Medicine and Hygiene, Philadelphia, Pa.                                                         |
|     | Nov. 2- 5      | Association of Clinical Scientists, "The Laboratory Diagnosis of Kidney Diseases", Washington, D.C.                          |
|     | Nov. 5- 8      | American Society of Plastic and Reconstructive Surgeons, New York, N.Y.                                                      |
|     | Nov. 5- 8      | National Agricultural Chemicals Association, 34th Annual Meeting, Palm Springs, California.                                  |
|     | Nov. 5- 9      | American Nuclear Society, Winter Meeting, Chicago, Illinois                                                                  |
|     | Nov. 6- 7      | Pharmaceutical Manufacturers Association, Midyear Meeting, Chicago, Ill.                                                     |
|     | Nov. 8- 9      | International Symposium on Carcinogenesis and Carcinogen Testing, (sponsored by Bio-Research Institute, Inc.), Boston, Mass. |
|     | Nov. 8-11      | Conference on Respiratory Therapy (4th Annual) Boston, Mass.                                                                 |
|     | Nov. 9-11      | Gerontological Society, St. Petersburg, Fla.                                                                                 |
|     | Nov. 10-11     | Symposium on Management of Trauma and Disaster Medical Care, (First Bi-Annual), Miami Beach, Fla.                            |
|     | Nov. 13-15     | National Fire Protection Association, Fall Conference, Omaha, Neb.                                                           |
|     | Nov. 13-16     | American Institute of Ultrasonics in Medicine, Miami Beach, Fla.                                                             |
|     | Nov. 16-18     | American Physical Society, New York, New York.                                                                               |
|     | Nov. 19-22     | Association of Military Surgeons of the United States, Washington, D.C.                                                      |
|     | Nov. 21        | Manufacturing Chemists Association, 17th Semiannual Meeting and Midyear Conference, New York, New York.                      |
|     | Nov. 25-26     | American College of Chest Physicians (Interim Clinical Meeting), Houston, Texas.                                             |
|     | Nov. 26-29     | American Association for Clinical Immunology and Allergy, Las Vegas, Nev.                                                    |
|     | Nov. 26-29     | American Medical Association, Clinical Convention, Houston, Texas.                                                           |
|     | Nov. 26-30     | American Institute of Chemical Engineers, 60th Annual Meeting, New York, N.Y.                                                |
|     | Nov. 26-Dec. 1 | Radiological Society of North America, Chicago, Illinois.                                                                    |
|     | Nov. 27        | Food & Drug Law Institute, Annual Conference with FDA, Washington, D.C.                                                      |
|     | Nov. 28        | American Society of Therapeutic Radiologists, Chicago, Illinois.                                                             |
|     | Nov. 29-Dec. 3 | American Medical Women's Association, Atlanta, Georgia.                                                                      |

### LEGAL DEVELOPMENTS

921 Lasers.

New York State's law controlling the sale of lasers has recently gone into effect, and in Illinois, Governor Otto Kerner has signed a laser registration law, which takes effect next

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January 1. The laws are an attempt to cut the number of laser beam accidents. The New York law prohibits the sale of any laser or device capable of emitting laser beams except to a person engaged in scientific or business research or to an instructor in an accredited school or college. The Illinois law requires high-energy laser systems to be registered, and injuries from use of lasers to be reported to the state.

-- Chem. Eng. News 45, 41 (Aug. 28, 1967).

922 Air Pollution Control in New York.

A positive step to control air pollution in New York City was the announcement by New York's Rent and Rehabilitation Administrator Frederic S. Berman that the city will grant tax abatements and rent increases to landlords of rent-controlled buildings who upgrade their incinerators to meet the new air pollution control rules. It is estimated that approximately 17,000 incinerators will be directly involved in this undertaking. It is reported that the tax relief that is being granted will pay about one-half of the average \$7,000 cost of upgrading an incinerator, and the landlord will be able to recoup the difference by making nominal rent increases.

-- Air Eng. 9, 2 (Aug. 1967).

BOOKS, PAMPHLETS AND NOTICES

- 923 Smoking and Illness. U.S. Department of Health, Education and Welfare, Public Health Service, PHS Publication No. 1622. 6pp. (1967). AVAILABLE FROM: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. PRICE: 10 cents each, \$7.00 per 100.

This leaflet has been prepared by the National Clearinghouse for Smoking and Health, Public Health Service, to present the highlights of a report\* issued in May 1967, by the National Center for Health Statistics. The economic contributions of cigarette smoking to the Nation are unquestioned; tobacco is a major agricultural crop, an \$8 billion industry, and each year contributes over \$3 1/2 billion in Federal, State, and local taxes. Findings of the new study published by the Public Health Service suggest that the economic contributions of the tobacco industry cannot be considered alone; that there are very large losses which are also incident to cigarette smoking. The new study reveals: Members of the Nation's labor force who smoke cigarettes spend over a third again as much time away from their jobs because of illness as persons who have never smoked cigarettes; Women who smoke cigarettes, including both housewives and those who work outside the home, spend 17 percent more days ill in bed than women who have never smoked. For the Nation as a whole, there are now 77 million "excess" lost workdays associated with cigarette smoking each year, representing almost 20 percent of the entire annual work loss in the United States which results from illness. (What has long been known about the relationship between cigarette smoking and death from certain chronic diseases is thus now shown to be true of illnesses and disability as well).

\* Entitled "Cigarette Smoking and Health Characteristics," this report was issued as Public Health Service Publication No. 1000-Series 10, No. 34, and will be found in most depository libraries. Single copies may also be obtained free from the National Clearinghouse for Smoking and Health, 4040 North Fairfax Drive, Arlington, Va. 22203, and by purchase from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, price 45 cents.

- 924 Standard for the Prevention of Dust Explosions in the Manufacture of Aluminum Powder. NFPA No. 651. National Fire Protection Association. AVAILABLE FROM: National Fire Protection Association, 60 Batterymarch St., Boston, Mass. 02110. 28 pp. (1967). PRICE: 50 cents.

One chapter has been added and two chapters completely revised for the 1967 edition of this publication recently published by the National Fire Protection Association. Wet milling of aluminum powder is covered in this standard for the first time; sections of the new chapter pertain to spontaneous ignition, static sparks, and flammable vapors. Thoroughly revised chapters are those dealing with conveying of aluminum powder and with methods of fighting aluminum fires—where the aluminum is in a paste or slurry with an organic solvent, and where the metal is in dry powder form. Adopted at the 1967 NFPA annual meeting, the text of this standard has been developed by the Sectional Committee on Metal Dusts of the NFPA Committee on Dust Explosion Hazards. R.W. Andrews, Jr. of the Aluminum Company of America, Pittsburgh, Pa., is chairman of the sectional committee.

- 925 Standard for the Storage, Handling and Processing of Magnesium. NFPA No. 48. National Fire Protection Association. AVAILABLE FROM: National Fire Protection Association, 60 Batterymarch St., Boston, Mass. 02110. 32 pp. (1967). PRICE: 60 cents.

Recommendations on storage and fire protection of magnesium and on handling and disposal of scrap magnesium have been up-dated and segregated in separate chapters of the 1967 edition of this work recently published by the National Fire Protection Association. Major additions to the text of this standard, approved at the 1967 NFPA annual meeting, include extensive recommendations for safe machining, based on new information on ignition characteristics of magnesium; description of an incinerator for dust collector sludge; a warning to vent sludge containers and to protect sludge from spontaneous heating; and the listing of foundry flux and cast iron chips as recommended extinguishing agents for magnesium fires. The importance of safe practices in regard to magnesium stems both from its combustibility and the ineffectiveness of ordinary types of extinguishing agents. This metal is widely used in the construction of household appliances, furniture, office equipment, portable tools, luggage, automobiles, buildings, machine parts and engines, and structural members of airplanes. The current text is the work of the Committee on Combustible Metals, headed by Richard B. Smith, of the U.S. Atomic Energy Commission, Washington, D.C.

- 926 Code for the Storage of Ammonium Nitrate. NFPA No. 490. 28 pp. (1967). National Fire Protection Association. AVAILABLE FROM: National Fire Protection Association, 60 Batterymarch St., Boston, Mass. 02110. PRICE: 50 cents.

Explosives and blasting agents should not be stored in the same building with ammonium nitrate, according to new specifications in this code. The important new separate buildings provision has been written into this code primarily to prevent sympathetic detonation of ammonium nitrate by explosion of an explosive or blasting agent. Sympathetic detonation normally is avoided by maintenance of "safe" distances between these two materials, but the text now emphasizes that these separations may vanish under fire conditions, such as when a pile of bags of ammonium nitrate collapses. Code NFPA No. 490, already widely used as the basis of municipal ordinances, is applied mainly to fertilizer-grade ammonium nitrate stored in bags and in bulk. There are special regulations for premises of makers, distributors and user-compounders of explosives or blasting agents. The revised text of this code is the work of the Sectional Committee on Storage, Handling and Transportation of Hazardous Chemicals of the NFPA Committee on Chemicals and Explosives.

#### INDUSTRIAL MEDICAL PRACTICE

- 927 Rent Tailor-Made Medical Facilities. Anon. Natl. Safety News 26, 50-52 (Sept. 1967).

The U.S. Small Business Administration estimates that 400 to 500 million mandays are lost every year by industry as a result of temporary disabilities due to sickness and accidents. They say that those losses can be reduced one-third to one-half by providing in-plant health services and medical facilities. Some of the services performed by a qualified (for rent) medical facility are: (1) Pre-employment medical exams. (2) Periodic individual health appraisals. (3) Treatment and care of on-the-job injuries and disabilities. (4) Preventive services including health education and safety instruction to eliminate potential hazards. On-the-site care and treatment of injuries cut down appreciably on production-time loss caused by absenteeism. One plant reports that it saved \$3,500 a year in wages paid for absenteeism during the first year it used a medical-dispensary program. Then too, it is likely that the facilities of an on-site medical service will help lower workmen's compensation costs. A reliable source, which has 300 employees, reduced those costs from \$18,000 to \$7,000 a year once it contracted for medical service. The preventive helps offered by a competent medical service are intangible and impossible to evaluate in dollars and cents. They are, nevertheless very real. Most available medical services are adaptable to a company's needs. Large or small companies can have on-site medical services tailor-made to suit their requirements. A letter for information to the American Medical Association, 535 North Dearborn, Chicago, Ill. 60610, will provide a list of competent companies offering medical services on a contract basis.

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- 928 The Role of the General Practitioner in Psychological Medicine. J. Horder.  
Proc. Roy. Soc. Med. 60, 261 (1967).

The author outlines the history of the management of psychological disorders in general practice in the last 25 years. He then considers the present role of the general practitioner in the detection and treatment of psychiatric illness, stressing the importance of uncovering the psychiatric background in cases of seemingly physical illness. The author emphasizes the need for sufficient time to achieve this, and presents his views of the type of case where treatment might be undertaken solely by the general practitioner.-- Can. Med. Assn. J. Absts.

- 929 The Significance of Blood Alcohol Levels at Autopsy. V.D. Pleuckhahn.  
Med. J. Australia 2, 118-124 (July 15, 1967).

Blood alcohol levels at autopsy are valid up to 48 hours after death when simple principles are observed in the collection and storage of samples. Alcohol levels in samples of blood taken from the intact heart are as significant as levels in blood from the femoral vessels. False blood alcohol levels greater than 0.2% can be generated in autopsy blood samples which are not correctly stored. High blood alcohol levels may develop during putrefaction, and levels up to 0.2% do not necessarily indicate that alcohol was imbibed before death. Significant false blood alcohol levels do not develop during incineration in the absence of putrefaction. Accepted chemical methods of analysis for "alcohol" measure various alcohols other than ethyl alcohol. An analysis of any autopsy sample is only as reliable as the conditions surrounding its collection.  
-- J. Am. Med. Assn. References & Reviews

- 930 Traumatic Hemoglobinuria Caused by Karate Exercises. J. A. Streeton.  
Lancet 2, 191-192 (July 22, 1967).

A case of hemoglobinuria after karate exercise involving considerable trauma to the hands is described. After investigation, which included the performance of the exercises under laboratory supervision, the hemoglobinuria was diagnosed as being a variant of march hemoglobinuria.  
-- J. Am. Med. Assn. References & Reviews

- 931 Effects of Pulsed Currents on Respiration and the Heart. W.R. Lee, S. Zoledziowski and S. Temiyachol. Brit. J. Ind. Med. 24, 220-231 (July, 1967).

The effects on the respiratory and circulatory systems of rabbits of pulsed currents from two sources have been studied. The sources were an industrial high-voltage test-set (source A) and an automobile ignition system (source B). When the fore-limb to fore-limb pathway was used, source A produced complete arrest of respiration at the highest output voltage, 5KV (corresponding to a current of 392 mA), and at a pulse repetition rate of 30 per second. Progressive reduction of either of these factors resulted in progressively less interference with respiration. With the fore-limb to hind-limb pathway, complete arrest of respiration occurred at an output voltage of 2KV (corresponding to a current of 140 mA) and at a pulse repetition rate of 30 per second. Again progressive reduction of either current or pulse repetition rate resulted in progressively less interference with respiration, although at 30 per second even with the lowest voltage setting (1KV; 64 mA) only diaphragmatic respiration occurred. Source B used on either pathway up to a pulse repetition rate of 16 per second did not cause complete arrest of respiration whether the current was taken straight from the ignition coil or off the distributor. Neither source caused ventricular fibrillation either when delivering pulses at a present rate or when the pulses were timed to coincide with successive T waves of the ECG. In these experiments the trains of pulses falling on the T waves lasted about 10 seconds. With both sources the current and voltage waveforms were similar and in phase. With source A increase in current was directly related to increase in applied voltage. These findings suggest that under these experimental conditions, with minimum contact resistance, the animal impedance is resistive with no significant reactance.-- Authors' abst.

- 932 Protection of Employees With Defective Vision. J. P. W. Hughes and M.A. Cooke.  
Brit. J. Ind. Med. 24, 240-243 (July, 1967).

An employer has a special duty towards a one-eyed man (Paris v. Stepney Borough Council, 1951) but does not have a special duty to a man with normal sight because employment could normally continue with good monocular vision. Clearly, a man with very defective vision in

one eye needs the same consideration as a one-eyed man so the authors examined the level of visual acuity which should alert the employer to giving a man special consideration. Two consultant oculists examined a chemist with Leber's syndrome and found 6/24 vision in each eye. One consultant advised taking greater care of the man's eyes because if one eye was lost, or became further damaged, he would have difficulty in continuing laboratory work. His colleague advised that the loss to the man would be of binocular vision and a no greater proportional loss than to the man with normal sight. Loss of binocular vision is considered greater in a man with poor eyesight because his visual acuity might, as in the present case, go from 6/18 using both eyes to 6/24 using one. The authors consider that wherever an employees' (corrected) sight is 6/18 or less in either eye then his case should be given special consideration which may then indicate the need for the provision of extra eye protection. -- Authors' abst.

- 933 Evaluation of a New Antiviral Agent. Amantadine Hydrochloride (Symmetrel). American Medical Association, Council on Drugs. J. Am. Med. Assn. 201, 374-375 (Aug. 7, 1967).

Amantadine hydrochloride, a stable, white crystalline amine of unusual symmetrical structure, is a new antiviral agent that may be useful for the prevention of illness caused by various influenza A2 (Asian) virus strains in man. Although observations have not been made in epidemics, the results of controlled studies in experimentally infected human volunteers have shown its partial efficacy (50%) as a prophylactic agent for several strains of influenza A2 virus. The drug is of no value as a therapeutic agent and should not be given after clinical signs of infection appear. In times of a demonstrated influenza A2 epidemic, amantadine may be used concomitantly with vaccine as a prophylactic agent. The drug is indicated specifically in patients of all ages for whom influenza A2 infection would entail a grave risk, and it is indicated particularly in these patients when vaccine cannot be used. Amantadine apparently impedes the penetration of the influenza A2 virus into the host cell. Although this effect is not complete, it is sufficient to reduce significantly the morbidity resulting from exposure to type A2 influenza virus. The exact mode of action of amantadine remains to be determined: it does not appear to affect the adsorption of virus on cell surfaces, nor does its antiviral effect seem to inhibit antibody synthesis completely. The drug does not exert a virucidal action. Clinical studies also reveal that amantadine is effective only if it is present in the tissues prior to their contact with the influenza A2 virus. Pharmacodynamic studies of the absorption, distribution, and excretion of amantadine have shown that the drug is almost completely absorbed from the gastrointestinal tract, and that 86% of a single oral dose is recoverable unchanged in the urine. Intensive investigations have revealed no evidence of metabolites in human urine. The half-life of the drug in man is estimated to be 20 hours. Very little amantadine is excreted in the feces and practically none in the expired air. Dosage: The daily dosage of amantadine hydrochloride in adults is 200 mg given in a single oral dose or, if preferred, in two divided doses. The drug has been administered for periods as short as 10 days and as long as 90 days; the average length of administration is two weeks. Supplied by—E. I. DuPont de Nemours & Company, Inc. (Symmetrel). Preparations—Capsules 100 mg; syrup 50 mg/5 ml.

Editor's Note: According to the Journal of the American Medical Association "This statement is an initial assessment of a new drug evaluated on the basis of available evidence. It does not necessarily represent the final opinion of the Council on Drugs, nor does it imply approval, endorsement, or acceptance of the drug."

- 934 A New Method for Calibrating the Kofranyi-Michaelis Respirometer. C. T. M. Davies and D. S. Shirling. Brit. J. Ind. Med. 24, 247-248 (July, 1967).

A method is described of calibrating the Kofranyi-Michaelis (KM) respirometer under normal laboratory conditions using expired air from a subject exercising in the steady state. During the calibration procedure the KM is connected to the subject via a valve and respiratory tubing and placed in a large airtight Perspex box from which an outlet tube passes to a Douglas bag. Calibration is made by comparing during a given time the content and volume of expired air in the Douglas bag with that passing through the meter at several different exercise flow rates. An example of a typical calibration experiment is given. -- Authors' abst.

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- 935 Familial Heart Disease. T. J. Tsagaris, R. A. Bustamante, and R. A. Friesendorff. Diseases of Chest 52, 153-158 (Aug., 1967).

A kindred with a high incidence of cardiac disease has been described. The mode of transmission is probably on the basis of a sex limited autosomal dominant gene. Postmortem examination in one case showed coronary atherosclerosis with occlusion of the anterior descending branch of the left coronary artery. Three members of this family had complete heart block with Adams-Stokes attacks requiring implantation of an artificial pacemaker. Two asymptomatic children had first degree atrioventricular block. Other manifestations of cardiac disease include cardiomegaly, intraventricular conduction disturbances, myocardial infarction, and primary T wave changes. Certain evidence favors the interpretation that the etiology of heart disease is an unspecified cardiomyopathy; however, because of the presence of atherosclerosis in one necropsied case and of myocardial infarction in two others, ischemic heart disease cannot be excluded. There are 19 references.

-- Authors' summary

- 936 Physique and Serum Lipids of Young London Busmen in Relation to Ischemic Heart Disease. R. M. Oliver. Brit. J. Ind. Med. 24, 181-188 (July, 1967).

Earlier studies of white London busmen revealed that the ischemic heart disease experience of conductors is better than that of drivers. Various factors which might be related to this difference have been considered, and earlier investigations have established that the physique and serum lipid concentrations of men in these two occupations are different. Since men in the younger occupational groups (25 to 29 years) showed some of these differences the suggestion has been made that conductors may be constitutionally different from drivers. The purpose of this paper is to report a study of the physique and serum lipid concentrations of young recruits for bus driving and conducting at an earlier age than in previous studies and before any occupational factors could have exerted an effect. Physical differences between the two groups were shown to exist. British bus driver recruits in the age group 21 to 24 years were on average 2.6 cm. taller than British conductor recruits. This is probably because selection favors the recruitment of taller men for driving. New entrant drivers were on average 7.3 lb (3.3 kg.) heavier, approximately 1 cm. broader across the shoulders, and between 2 and 3 cm. bigger around the chests and waists than conductors. It is shown that these differences are mainly secondary to differences in height. Drivers recruited from the ranks of existing conductors resembled new entrant drivers in everything but height. British driver trainees carried more skin fat and had a tendency to higher serum lipid concentrations than conductors. This is shown to be neither secondary to differences in height nor occupationally acquired. The importance of these findings in relation to the differing ischemic heart disease experience of bus drivers and conductors is discussed. It is suggested that the underlying factor responsible for the known later physical differences and different ischemic heart disease experience of London bus drivers and conductors might be a common genetic one.

-- Author's abstr.

- 937 Transoceanic Radio Transmission of Electrocardiograms. J. C. Hirschman, T. J. Baker, and A. F. Schiff. Diseases of Chest 52, 186-190 (Aug. 1967).

The successful transmission of electrocardiograms from Guinea in Africa to Miami, Florida is reported. The equipment used is standard, not overly expensive, and readily available. The methods used are recommended for ships at sea, isolated hospitals, and emergency situations. The techniques can be applied to biomedical data of similar nature from other organs such as spirometers, pneumotachographs, and EEG's. In fact, they have been applied to phonocardiograms. Such radiocommunications increase the diagnostic coverage of emerging computer centers for mass health screening surveys and biomedical data interpretation. There are 6 references.

-- Authors' summary

- 938 Some Instrument-Induced Errors in the Electrocardiogram. J. L. Meyer. J. Am. Med. Assn. 201, 351-356 (Aug. 7, 1967).

To investigate the character and extent of the errors due to poor frequency response that present-day equipment may introduce in the amplification of the electrocardiographic signal, a single, electronically simulated electrocardiogram complex was recorded by means of an amplifier with a variable frequency response. Poor high-frequency response resulted in attenuation of the R and S waves, and the attenuation increased in a smooth curve with decreasing frequency response. However, the R and S were attenuated by different factors for

any given value of high-frequency cutoff. Inadequate low-frequency response gave rise to R, S, and T amplitude distortions that again followed a smooth curve with degenerating frequency response, and these waves were distorted by different factors for any single value of low-frequency cutoff. In addition, poor low-frequency response inserted S-T segment depressions and post-T sags. Much equipment in current use is capable of producing such distortions to a significant extent. There are 9 references. -- Modified from Author's abstr.

- 939 The Heart's Pacemaker. E. F. Adolph.  
Sci. Am. 216, 32 (March, 1967).

It appears that when the heart of the embryo begins to beat, it functions as an independent organ, driven only by its own inherent pacemaker. As it grows older, it becomes receptive to one extrinsic influence after another and through them becomes the servant of many organs and activities of the body. In the adult animal it is capable of a wide range of responses to the body's needs. The full development of its responses and regulation does not come until long after birth, but we can see the beginnings of the arrangements even before the animal is born. -- Can. Med. Assn. J. Abstr.

- 940 Effect of Unsaturated Fatty Acid on the Incidence of Coronary Infarction. H. Natvig.  
Tidsskr. Norske Laegeforen 87, 1033-1041 (June 1, 1967).

A controlled 12-month trial was conducted in order to assess the prophylactic effect of linolenic acid on coronary atherosclerosis. Subjects were 16,615 men (50 to 59 years old) working in industrial firms. For each man a health form was completed on the basis of a medical examination or personal interview by the industrial physicians. One group of 6,720 men were given a daily dose of 10 ml. linseed oil with approximately 55% of linolenic acid. The other group, consisting of 6,692 men, received a daily dose of 10 ml. of sunflower oil with approximately 63% linolenic acid. The control group (3,052 men) was not given oil. After a 12-month observation period, there were no statistically significant differences between the groups with regard to coronary atherosclerosis; the prophylactic effect of a daily intake of linseed oil or sunflower oil was not demonstrated. The trial revealed a significantly higher rate of coronary infarction, angina pectoris, and atherosclerosis obliterans in cigarette smokers when compared with nonsmokers, and in men with persistently elevated blood sedimentation rates when compared with men with normal values. -- J. Am. Med. Assn. References & Reviews

- 941 Complacency in Carcinoma of the Lung. O. C. Brantigan.  
Diseases of Chest 52, 173-185 (Aug., 1967).

Complacency in diagnosis and treatment of carcinoma of the lung is based upon poorly understood statistical evidence. All statistical evidence indicates only 2 to 5% of patients with carcinoma of the lung will survive five years or longer, but the figures are based upon patients when first seen by the thoracic surgeons even though the greatest number of these patients are beyond help by any method of treatment when first seen. The deficiency of early detection and diagnosis must be emphasized. There is a long interval of time when the carcinoma of the lung is not detectable by present methods; effort to study detection of invisible cancer during this period must be accentuated. All methods of detection now available must be utilized efficiently. No lesion of the lung should be allowed to exist unidentified. The medical profession should by clinical research and study establish a pretreatment clinical staging classification of carcinoma of the lung. If acceptable and adopted by the responsible medical and surgical associations throughout the world, a pretreatment clinical staging classification could become a method of pinpointing the deficiency in early detection and serve as a basis for recognition or judging the results of various types of treatment. The pretreatment clinical staging classification would permit careful study of groups of patients that are comparable at the time of diagnosis and at the time of treatment. It would in no manner dictate the type of treatment that might be used. -- Author's summary

- 942 Relative Risk of Pulmonary Cancer in Cigar and Pipe Smokers. T. Abelin and O. R. Gsell.  
Cancer 20, 1288-1296 (Aug., 1967).

Smoking habits of 118 male patients with cancer of the lung from a rural area of Switzerland were compared with those obtained in a survey of all male inhabitants of a rural town in the same region. Adjusted relative risks of pulmonary cancer were computed for cigar and pipe

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smokers in relation to cigarette smokers. Adjustment was made for amounts smoked among cigarette smokers and an estimate of relative risk was obtained in relation to nonsmokers. Risk of pulmonary cancer for all smokers of products other than cigarettes was 5.6 times (95% confidence limits: 3.6 to 8.6) that for nonsmokers. For heavy cigar and pipe smokers the risk was 1.7 times that of cigarette smokers and 14.7 times that of nonsmokers (95% confidence limits: 8.9 to 24.4). The results of this study differ from those obtained in the United States but are compatible with findings in countries with a larger proportion of cigars and pipe smokers. -- Authors' abstr.

- 943 Production of a Cigarette of Lower Temperature of Combustion and Its Significance. E. R. Trethewie. *Med. J. Australia* 1, 483-488 (March 11, 1967).

Because carcinogens are produced in the temperature range of 700°C. (1292°F.), the author compared the combustion temperature of manufactured and roll-your-own cigarettes, pipes, and cigars. The burning temperature of loosely packed, roll-your-own cigarettes, in a safe range of around 600°C. (1112°F.) was comparable to pipes and cigars and in contrast to manufactured cigarettes, which is above 700°C. (1292°F.). There are 7 references.

-- Public Health Eng. Abstrs.

- 944 Role of Surgery in the Cure of Lung Cancer. K. R. Boucot, D. A. Cooper, and W. Weiss. *Arch. Internal Med.* 120, 168-175 (Aug. 1967).

One hundred and five lung cancers have been detected through semiannual screening of 6,069 men whose chest films showed no evidence of tumor at the start of observation. The five-year survival rate was 5% from histological diagnosis and 7% from the date on which the cancer was first suspected on x-ray films. The study was limited to 52 men who were sufficiently cooperative to have an interval of 6 to 12 months between the last negative and the first abnormal film. Twenty-four of these men had resections and six died post-operatively. The best possible five-year survival rate for the 23 men with "curative" resections will be 26% if all seven men alive in this group survive five years after detection.

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

- 945 Effects of Epinephrine and of Smoking in Patients With Peripheral Atherosclerotic Vascular Disease. K. J. Kingsbury and R. J. Jarrett. *Lancet* 2, 22-23 (July 1, 1967).

The responses of blood glucose and plasma levels of nonesterified fatty acids (NEFA) and immunoreactive insulin (IRI) to subcutaneous epinephrine and to smoking were measured in 36 male patients with peripheral atherosclerotic vascular disease. Under basal conditions, the NEFA response to both epinephrine and smoking was within normal limits. Epinephrine consistently provoked a rise in the blood glucose, whereas smoking either had no effect or lowered the fasting concentration. In five patients, smoking caused a rise in plasma IRI. It is suggested that this response to smoking may occur in people who are hypersecretors of insulin.

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

- 946 Effects of Rabies Vaccine in Man. J. C. M. Sharp and S. McDonald. *Brit. Med. J.* 3, 20-21 (July 1, 1967).

Twenty persons aged between 8 and 59 years were exposed to infection from a rabid leopard cub. An outline is given of the reactions they experienced following immunization with Semple rabbit-brain vaccine. Two persons, aged 59 and 40 years were seriously ill and others suffered severe discomfort. One required admission to a hospital and suffered from acute neurological symptoms. Conversely, three children and a youth, aged 15 were relatively unaffected despite their failing to minimize normal physical activities. It is suggested that susceptibility to Semple vaccine also increases with age. In the absence of a more suitable vaccine, the importance of restricting human access to animals in quarantine in order to reduce the number of persons exposed to possible infection and subsequently to the hazards of immunization is emphasized.

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

- 947 Insects as Potential Sources of Ingestant Allergens. H.S. Bernton and H. Brown.  
Ann. Allergy 25, 381-387 (July, 1967).

The dialyzed extracts of eight food-contaminating insects have been used in a series of cutaneous tests. The entire life cycle of these insects is confined to plant products. The incidence of positive cutaneous reactions in a group of 230 unselected allergic patients is 68% or 30%. The incidence of positive cutaneous reactions in a group of 194 "normal" non-allergic individuals is 50% or 25%. The allergen of four insect extracts is thermostable. Preliminary tests indicate the presence of skin-sensitizing antibodies and precipitins among the reactors of both the allergic and non-allergic. Insect-contaminated food is unavoidable. Twenty-eight per cent of our combined groups exhibit a skin sensitiveness. A more definite characterization of allergens and antibodies by the immunologist will help identify those of clinical importance. The Indian meal moth heads the list of insects capable of provoking positive skin reactions.

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

- 948 Teflon Embolism of Coronary Arteries. F. Gonzalez-Crussi, et al.  
J. Thoracic & Cardiovasc. Surg. 54, 53-59 (July, 1967).

A patient is described who developed coronary embolism of Teflon material from a Hufnagel prosthetic aortic cusp. Bacterial endocarditis appeared to have contributed significantly to development of the embolic phenomena. The case is unusual in that the clinical, bacteriological, and histopathological evidence indicated an eradication of the active bacterial endocarditis during life, and the patient succumbed to the effects of coronary Teflon embolism.

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

- 949 Immunological Diagnosis of Type of Snake in Snake Bite. E.R. Trethewie and P.A. Rawlinson.  
Med. J. Australia 2, 111-113 (July 15, 1967).

Serum expressed from the region of simulated bite and actual snake bite in animals has been separated and has been shown to react specifically with a series of antivenenes. The technique employed for this analysis is double diffusion in agar, and while the reaction time has varied from two to five hours, it is expected to speed this up to one hour or less with certain modifications. In the first instance one should give antivenene according to the type of the snake, if this information is available, and taking into account the geographical distribution.

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

- 950 Occupational Disability in Patients With Chronic Airway Obstruction. C.F. Diener and B. Burrows. Am. Rev. Resp. Dis. 96, 35-42 (July, 1967).

In a group of 99 emphysema-bronchitis patients who were not disability applicants, work status was closely related to the exertional demands of their usual occupations and to measurements of expiratory slowing. Electrocardiographic findings had some independent usefulness in predicting work status. Pulmonary function tests and other clinical and laboratory data did not further improve this prediction. As a rule, patients with a forced expiratory volume (one second) (FEV<sub>1.0</sub>) of 1.0 liter or more continued to work unless their occupations were very demanding physically. The prognosis for continued employment was poor when the FEV<sub>1.0</sub> was below 0.75 liter regardless of occupation. -- J. Am. Med. Assn. References & Reviews

- 951 Emphysema Produced in Dogs by Cigarette Smoking. O. Auerbach, et al.  
J. Am. Med. Assn. 199, 241-246 (Jan. 23, 1967).

Pulmonary fibrosis and emphysema, similar to those conditions in human beings, were found in dogs that had smoked cigarettes twice daily for more than 420 days. There are 9 references.

-- Public Health Eng. Absts.

- 952 Asbestosis and Malignancy. N. G. Demy and H. Adler  
Am. J. Roentgenol. 100, 597-602 (July, 1967).

History reveals a relationship between asbestosis and malignancy. A study based on 20 years' experience with asbestosis in an industrial community shows a correlation between malignancy and long-term exposures varying from 15 to more than 25 years. Of 47 patients studied, 36 had carcinoma, one had fibrosarcoma, and 10 had mesothelioma. All of these 47 patients had previous long exposure to asbestos products and processing.

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

IN RE: AIRBAMIS NOVEMBER 1968

- 953 Solar Retinopathy. A. E. A. Ridgway.  
Brit. Med. J. 3, 212-213 (July 22, 1967).

Five new cases of solar retinopathy are presented. Four cases followed the partial eclipse of May 20, 1966, and the fifth resulted from casual exposure while sunbathing. The incidence of solar retinopathy and cases of exposure recorded previously are reviewed with particular reference to the sinister implications of chance macular burns. Greater public awareness of the dangers involved in gazing at the sun is advocated.

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

- 954 A Note on the Bacteriology of Dry Cleaning. T. A. Pressley.  
Med. J. Australia 2, 1033-1034 (Nov. 26, 1966).

Dry cleaning appreciably reduces the bacterial count under normal circumstances, but seldom produces a sterile article. Pathogenic bacteria (pus, serous exudate) can be distributed throughout a machine load during processing, and counts of pathogenic organisms may be higher than before dry cleaning. There are 10 references.

-- Public Health Eng. Absts.

- 955 Mortality in a Movie Projectionist Union in Boston, 1910-1964. B. G. Ferris, Jr. and J. Worcester. Brit. J. Ind. Med. 24, 178-180 (July, 1967).

More than 25 years ago concern was expressed regarding the effects of gases and fumes from carbon arcs and of considerable heat stress on the health of movie projectionists (Coltman, 1938; MacQuiddy, Tollman, La Towsky, and Bayliss, 1938a, b; Drinker and Snell, 1938; Downes, 1940). A number of studies at that time concluded that if the lamp housings were adequately ventilated and if the booths were ventilated so that there was no heat stress, then the exposures to the gases and fumes were insignificant. Following these studies, in about 1940, all major cities in the United States passed legislation to ensure adequate ventilation of the housings and the booths. The recent increase in mortality due to chronic lung disease in the United States reawakened the concern of motion picture operators that there had been significant exposures in the booths. However, this examination of the mortality experience of the members of a movie projectionist union in the United States revealed no significant difference between the group that entered prior to 1940 and the group that entered after 1940, nor was their mortality experience greater than that of the general population. It is concluded, therefore, that the possible different levels of exposure of the two groups to the gases and fumes from carbon arcs and to the heat stresses did not contribute significantly to their mortality. Exposures prior to 1940 were largely to oxides of nitrogen in the booths. Reported figures (Frederick, quoted by Downes, 1940), were in the range of 0-7.8 p.p.m. Frederick's survey of theatres in Detroit was done about 1939 and is probably representative of projection booths in general at that time in the United States. Those booths with the higher values also had considerable odour of fumes from the arcs. The fumes consisted of various metallic oxides and a few rare earth oxides. None of the fumes attained a significant level in the booths even though the ventilation of the projector was accomplished only by natural convection from the heat of the arc.

#### SKIN DISEASES AND BURNS

- 956 Recent and Current Trends in Burn Research and Treatment. D. A. Kernahan.  
Can. Med. Assn. J. 97, 433-435 (Aug. 26, 1967).

Some current trends in burn research and treatment are reviewed, particularly concerning the toxemia of burns and the use of convalescent serum in its therapy. Experimental work with proteolytic enzymes is also described. The importance of *Pseudomonas* septicemia is again stressed and the use of a vaccine against massive *Pseudomonas* infection is described. Only recently has it been realized that large losses of water may occur from burned surfaces even when covered by a dry eschar. The use of a plastic sponge as synthetic skin is also briefly commented upon. There are 20 references.

-- Author's summary

- 957 Antibiotics, Infection and Immunological Aspects of Burns. L. R. Chasmar.  
Can. Med. Assn. J. 97, 436-439 (Aug. 26, 1967).

Convalescent burn serum does not seem to be of practical value. In the future vaccine will probably be used to immunize the burned patient, not against a burn toxin, but against specific microbes. The burned patient does not always require antibiotic "cover" from the beginning of treatment. If an antibiotic is used routinely and no contraindications exist, penicillin is the drug of choice. When a culture and sensitivity have been obtained, the specific antibiotic should be used. Repeated blood cultures are necessary in severe burns. Once a positive culture has been obtained, the specific antibiotic is administered immediately in adequate or more than adequate doses for approximately five-day periods. This course of treatment should be repeated if necessary. In this way a maximum assault on the infecting organisms can be obtained. There are 28 references.

-- Author's summary

- 958 The Renal Complications of Burns. D.D. Gellman.  
Can. Med. Assn. J. 97, 440-444 (Aug. 26, 1967).

Severe burns are followed by oligemic shock; this, and intravascular agglutination of red blood cells, often causes renal failure. Morphologically, the most striking changes in the kidneys are in the tubules, but functionally the most important change is a reduction in glomerular filtration rate. Tubular function is usually well preserved. Early and complete restoration of circulating blood volume will often prevent, or rapidly correct, renal failure. Four references are given.

-- Author's summary

- 959 Pathology, Mortality and Prognosis of Burns: A Review of 54 Critical and Fatal Cases.  
R. V. Argamaso. Can. Med. Assn. J. 97, 445-449 (Aug. 26, 1967).

Fifty-four patients with severe and fatal burns admitted to the Winnipeg General Hospital and Children's Hospital within a 10-year period (1954-1964) were reviewed in an attempt to determine some of the factors that affect mortality in thermal burns. Thirty postmortem examinations were done; in these the organ changes were not severe enough to cause death except in those who inhaled heat and fumes at the time of the thermal injury. In some instances the exact cause of death could not be determined. In this series, the high incidence of pulmonary sepsis appears to be due to the frequency of burns involving the head and neck and associated injury to the respiratory system. Septicemia was also frequent, although bacteriological proof was not always obtained because of infrequent blood cultures. Pulmonary infection, general sepsis, and cardiac complications in the older age groups are major contributing causes of death in thermal burns in this series. There are 26 references.

-- Author's summary

- 960 Anesthesia for the Burned Patient. T. J. McCaughey.  
Can. Med. Assn. J. 97, 449-452 (Aug. 26, 1967).

The anesthetist has an important part to play in helping the burned patient over a painful and depressing experience. Burns of the face should suggest the possibility of airway obstruction and latent lung damage. The possibility of toxemia or encephalopathy should come to mind when sedation is requested in the early stages. When skin grafting is surgically feasible, anesthesia must be undertaken no matter how great the risk. Operating room personnel will need to be doubled to handle these cases efficiently. The author prefers a cyclopropane induction and light halothane anesthesia by endotracheal tube: veins are cannulated during the vasodilatation produced by general anesthesia. Blood replacement should be generous to maintain hemoglobin at 12g./100 ml. After the third week, succinylcholine may induce cardiac arrest in patients with third-degree burns greater than 20%. Intravenous meperidine (1mg./kg. body weight) given slowly towards the end of an operation will help to retain the patient's confidence for future operations. There are 13 references.

-- Author's summary

- 961 Electrical Burns. L. R. Chasmar.  
Can. Med. Assn. J. 97, 453-458 (Aug. 26, 1967).

Four patients are described who illustrate some of the problems encountered in the management of electrical burns. From this experience it does not seem that progressive necrosis is a true entity. Certainly, in the skull, an electrical burn is well demarcated from the beginning and remains so. In other areas, healing is slow and more than one debridement

may be required because electrical tissue coagulation is difficult or impossible to recognize in the gross and the surgeon usually underestimates the amount of tissue that has to be removed. Radiological examination of the skull is of limited value in revealing the extent of bone necrosis. Lenticular opacities, a delayed complication of electrical burning, are associated with no other ocular damage. Nerve palsy is common. For this reason, the neurological examination of the patient with even the slightest electrical burn should be done so that such palsies can be recognized and functional splinting can be applied at once. In general, electrical burns are interesting injuries. Those of the skull are particularly so because if the victim survives the initial electric shock despite coagulation of large areas of scalp or skull, there is little permanent injury to the brain itself. Seven references are given.

-- Author's summary

- 962 An Analysis of Burns in Children. I.R. Munro, et al.  
Can. Med. Assn. J. 97, 459-463 (Aug. 26, 1967).

The results of 548 burn patients admitted to The Hospital for Sick Children, Toronto, between 1961 and 1965 were analyzed and compared with the results obtained during previous reviews from this center. Fifty-seven of these patients were under three years of age and 85% of the burns occurred in the home. Two hundred and twenty-five patients needed skin grafting. Fewer clothing burns were seen than would be expected; this was attributed to the wide use of central heating in this part of Canada. In decreasing order pyogenic staphylococcus, hemolytic streptococcus and Pseudomonas aeruginosa were the most common organisms cultured from burn wounds. Strict retrospective criteria were applied in assigning the diagnosis of septicemia. Sixteen patients fulfilled these criteria. Only two patients had proved Pseudomonas septicemia; both died. The mortalities were analyzed by probit analysis. Twenty-one patients died, but in only eight was septicemia proved before death. The mortality following burns has remained unchanged at this hospital over the last 24 years. There are 20 references.

-- Authors' summary

- 963 Phagocytic Depression in Thermal Injuries. M.S. Rittenbury and L.D. Hanback.  
J. Trauma 7, 523-537 (July, 1967).

The phagocytic capacity of the peripheral and subcapsular leukocytes and of the fixed phagocytes of the reticuloendothelial system has been measured in normal and burned animals and humans. The techniques used to measure the phagocytic indices in the granulocytes were standard ones, and the indices were found to remain normal following the experimental production of a lethal thermal injury in dogs. A new technique utilizing colloidal fat emulsion has been used to measure the phagocytic capacity of the fixed reticuloendothelial system cells, and this was shown to be severely compromised after a lethal burn injury was induced. Penicillin limited phagocytic capacity.

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

- 964 Porphyria Cutanea Tarda and Estrogens. J.T. Vail, Jr.  
J. Am. Med. Assn. 201, 671-674 (Aug. 28, 1967).

Porphyria cutanea tarda can be induced by a variety of compounds, including estrogens. Cutaneous manifestations of the disease are characterized chiefly by a light- and trauma-sensitive eruption of exposed areas. In two cases occurring secondary to estrogens, improvement followed estrogen withdrawal. Estrogens are known to be capable of impairing hepatic excretory function, but their precise role in inducing porphyria is not understood. It is possible that in predisposed individuals they inhibit enzymes necessary for the normal metabolism of porphyrins.

-- Author's abst.

- 965 Allergic Contact and Photodermatitis. W.D. Robertson and J.C. Mitchell.  
Can. Med. Assn. J. 97, 380-386 (Aug. 19, 1967).

The role of exposure to allergic contact sensitizers and photosensitizers in dermatitis chiefly affecting skin surfaces not usually covered by clothing is difficult to evaluate and calls for patch and photopatch testing in addition to clinical assessment. In seven such patients the following disorders were found: (1) Photosensitivity to sunlight without any known chemical mediator, (2) photosensitivity following systemic administration of chlorpromazine, (3) photosensitivity following topical application of salicylanilides, (4) allergic contact dermatitis caused by d-usnic acid derived from lichens, (5) allergic contact dermatitis caused by atranorine and evernic acid derived from lichens, (6) allergic contact dermatitis caused by species of moss and (7) concomitant allergic contact dermatitis caused by plant oleoresins, polymorphic

photodermatitis of the eczematous type and atopic dermatitis. Apart from the chronicity or acuteness of the dermatitis, the clinical features in these patients had much in common, particularly their distribution on exposed skin surfaces. Such dermatitis may have a complex and varied etiology. There are 11 references. -- Authors' summary

- 966 Use of the Albino Guinea Pig to Detect the Skin-Sensitizing Ability of Chemicals. M. A. Stevens. Brit. J. Ind. Med. 24, 189-202 (July, 1967).

The guinea pig has been used for over 20 years to demonstrate skin-sensitizing ability in chemical compounds. Correlation between the results of workers in this field is difficult because of the wide range of conditions under which tests for sensitizing potential have been performed. This has made difficult any attempt to compare the relative abilities of various chemical compounds to produce skin sensitization. In a routine test for skin-sensitizing potential, solutions of suspected sensitizing substance have been applied over three days to the ears of guinea pigs, and the flanks have been challenged one week later with a range of concentrations of suspected sensitizing substance. The erythematous reaction produced 24 hours after challenge was rated and compared with that in unsensitized controls. Various alternative methods of skin testing have been compared with this ear-flank test. The ear-flank test gives good, reproducible results with many classes of chemical compounds, including types of compound not previously described as giving rise to sensitization in the guinea pig or in man, and including some compounds which are known to have carcinogenic potential. It is also demonstrated that sensitizing potential is found more frequently among aromatic (aryl) than aliphatic (alkyl) compounds. Particularly strong sensitization reactions are produced by certain aryl halides, arylisocyanates, aryl hydrazines, N-nitroso compounds, and aromatic nitroso compounds. An attempt is made to relate the results of animal tests to reported cases of human skin sensitization. -- Author's abstr.

#### CHEMICAL HAZARDS

- 967 Allergy to Fluoride. J. J. Shea, S. M. Gillespie, and G. L. Waldbott. Ann. Allergy 25, 388-391 (July, 1967).

Six children and one adult exhibited various allergic reactions after the use of toothpaste and vitamin preparations containing fluoride. The following conditions were encountered: urticaria, exfoliative dermatitis, atopic dermatitis, stomatitis, and gastrointestinal and respiratory allergy. The etiological relationship with fluoride was confirmed in one case by a double-blind test, in another by a positive patch test. Five of six children, in whom other measures had been to no avail, improved promptly and the disease was controlled in all by discontinuing the fluoride drops or fluoride toothpaste. -- J. Am. Med. Assn. References & Reviews

- 968 Severe Lithium Poisoning. M. Schou, A. Amdisen, J. Trap-Jensen. Nord. Med. 77, 831-837 (June 29, 1967).

Eight cases of severe lithium poisoning occurred in patients given relatively large lithium doses for prolonged periods. Prodromal symptoms included sluggishness, languidness, drowsiness, coarse tremor or muscle twitchings, dysarthria, loss of appetite, vomiting, and diarrhea. The predominating symptoms were referable to the central nervous system: severe impairment of consciousness (sopor) and in some cases complete coma, muscular hypertension with hyperactive deep reflexes, universal muscle tremor or fasciculations, and the appearance, spontaneously or after stimulation, of attacks of increased muscle tone which lasted a few seconds. In some cases transitory neurological asymmetries could be observed. Kidney function and ECG were frequently affected moderately and reversibly. Three patients died of pneumonia. In the rest of the patients the symptoms abated gradually and disappeared within one to three weeks. -- J. Am. Med. Assn. References & Reviews

- 969 Biochemical Changes in Rat Liver After Acute Beryllium Poisoning. H. P. Witschi and W. N. Aldridge. Biochem. Pharmacol. 16, 263-278 (Feb., 1967).

Rats were injected intravenously with 0.75 mg. Be/kg. and the effects upon liver metabolism were investigated within the first 24 hours. Poisoned animals showed an impaired loss of liver glycogen during fasting. Studies upon the incorporation of labelled glucose into liver glycogen,

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the ability of poisoned livers to resynthesize glycogen, and determination of the concentration of glucose-6-phosphate failed, however, to establish a relationship between changes in glycogen metabolism in vivo and the highly specific inhibition of phosphoglucomutase by beryllium in vitro. There are 60 references.

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

- 970 An Investigation of the Combustion Products of Alkyl Lead Compounds. R. Gelius and W. Franke. *Brennstoff-Chem.* 47, 280-285 (Sept., 1966).

Tetramethyl-, tetraethyl-, and tetra-n-propyl lead were burned in air in the presence of n-heptane, isooctane, or benzene. The combustion products were collected on the surface of a cooled glass tube, in a glass wool filter, and in an electrofilter. In order to eliminate the formation of nitrites, the nitrogen in the air could be replaced by argon. The combustion of the alkyl lead compounds takes place as follows: the compounds thermolyze when the combustible mixture approaches the hot regions of the flame. The result is a smoke of fine PbO particles. The combustion residues are then almost identical to those from the alkyl lead mixture. In the third zone, behind the flame,  $\text{PbCO}_3$  (52-86%),  $\text{PbO}$  (13-45%),  $\text{PbO}_2$  (as  $\text{Pb}_3\text{O}_4$ , etc., 0.1-3%), and  $\text{Pb}(\text{NO}_2)_2$  is formed. In internal combustion engines the effectiveness of PbO as an antiknock agent lasts about 1 millisecond. These experiments suggest that the surfaces of the PbO particles may convert to  $\text{Pb}(\text{NO}_2)_2$  thereby rendering the antiknock additive ineffective.

-- APCA Absts.

- 971 Early Signs of Lead Exposure. A Comparative Study of Laboratory Tests. A. deBruin and H. Hoolboom. *Brit. J. Ind. Med.* 24, 203-212 (July, 1967).

Previous work has shown that urinary lead, coproporphyrin (CP), and delta-aminolaevulinic acid (ALA) are closely related after exposure to lead. The authors have confirmed the relationship in 50 automobile workers with different exposures, and have also estimated porphobilinogen (PBG) levels. There was some evidence that a raised ALA level gave an earlier sign of lead absorption than a raised CP level. ALA-dehydratase activity (converting ALA to PBG) was greatly reduced by exposure, on the average to 20% of normal. This reduction in activity was strongly correlated with the increases in urinary lead, CP, and ALA and is the most sensitive test of exposure to lead. A weak correlation was found between the number of coarsely stippled cells, or the basophilic quotient, and the urinary levels of lead, CP, and ALA. In addition, the serum aspartate amino transferase (SGOT) and serum alanine amino transferase (SGPT) levels were estimated and were not affected by exposure to lead. The serum protein patterns and hemoglobin levels were also unaffected.

-- Authors' abst.

- 972 Severe Intravenous Petrol Intoxication With Recovery. L. Gofman and I. Pasztory. *Orv. Hetilap* 108, 1135-1136 (June 11, 1967).

A 20-year-old woman attempted suicide by administering 20 ml. petrol intravenously. Diffuse hemorrhagic pneumonia, confluent bronchopneumonia, and severe myocardial lesion developed. Antibiotic therapy and intravenous prednisolone administration led to total recovery.

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

- 973 Acute Effects of Turpentine Vapor on Rats and Mice. F. Sperling, W. L. Marcus, and C. Collins. *Toxicol. & Appl. Pharmacol.* 10, 8-20 (Jan., 1967).

The  $\text{LC}_{50}$  of turpentine vapor for rats for intervals of 1 to 6 hours of exposure ranged from about 20 to about 12 mg./liter. A 2-hour  $\text{LC}_{50}$  for mice was determined as 29 mg./liter. Exposure to vapor caused an increase in respiratory rate, a decrease in tidal volume, and no change in minute volume in rats. No evidence was found of pulmonary lesions induced by turpentine. There are 16 references.

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

- 974 Chloroform—Cause of Pregnancy Toxemia? J. Tylleskar-Jensen. *Nord. Med.* 77, 841-842 (June 29, 1967).

The literature on chronic exposure to chloroform is very sparse. Two cases are described of pregnant women who developed eclampsia at intervals of five months. Both worked in the same environment and during the greater part of pregnancy they had been continuously exposed to chloroform in concentrations ranging between 300 and 1,000 ppm., which exceed the accepted borderline values. Since liver disorders were also noted in some of the rest of the laboratory

personnel, it is probable that the chronic chloroform poisoning in these two cases caused liver damage and that this in turn, together with other mechanisms, brought about eclampsia or was a conductive factor in the causation of it. Pregnant women who work with chloroform should be instructed to use the utmost caution. -- J. Am. Med. Assn. References & Reviews

- 975 Organo-Chlorine Pesticide Residues in Human Depot Fat. J.R. Brown.  
Can. Med. Assn. J. 97, 367-373 (Aug. 19, 1967).

Organo-chlorine pesticide residues were determined in 47 human adipose tissue samples. The concentration of these materials in Canadian samples does not appear to have increased since 1959-1960. The biological significance of pesticide residues in human adipose tissue is discussed. At the present time these do not appear to constitute a serious threat to health. There are 49 references. -- Author's summary

- 976 "Belladonna" Poisoning Confused With Botulism. E.R. Eichner, J.M. Gunsolus, J.F. Powers.  
J. Am. Med. Assn. 201, 695-696 (Aug. 28, 1967).

In 1963 stramonium (belladonna) poisoning developed in five persons in a family after they had eaten tomatoes grown from a plant grafted to jimson weed (*Datura stramonium*). Two were hospitalized, a diagnosis of botulism was considered before the correct diagnosis was made. This report describes a similar incident. Belladonna poisoning also developed in the two patients described in this paper after they had eaten tomatoes. During their early hospital course, botulism was considered a likely diagnosis. There are 8 references.

#### INDUSTRIAL DUSTS

- 977 Dust Generation and Removal in Shot-Blasting Chambers. F. Engelberg.  
Giesserei 54, 144-148 (March 16, 1967). German.

The rate of dust generation in shot-blast chambers for large castings is described by a differential equation. Assuming a uniform rate of ventilation, the dust concentration in the ventilated air is found as a function of time. It rises from zero at the beginning of the cleaning process to a peak, and then falls off toward zero as time progresses. A dust removal plant must be designed for this peak concentration rather than for an average dust concentration. An increased rate of ventilation and a decreased rate of dust generation at the beginning of the cleaning process lower the maximal dust concentration. A simple but effective wet washer is briefly described. -- APCA Absts.

- 978 A Method for the Estimation of the Respiratory Deposition of Airborne Materials. B. Schleien, A.G. Friend, and H.A. Thomas, Jr. Health Phys. 13, 513-517 (May, 1967).

An assessment of the degree of respiratory deposition for an exposed population was attempted by two mathematical models tied together by linear programming techniques. One model, derived from an aerosol sizing sampler of filters nested in order of increasing retentivities showed aerosol particle size as a function of filter efficiencies. The other model shows deposition in the nasal, tracheobronchial and pulmonary regions as a function of aerosol size. The approach to field estimation of the pulmonary deposition of airborne materials gave reasonable results for selected radionuclides consistent with current deposition models. The method should prove useful also in the evaluation of all particulate air pollution. -- APCA Absts.

- 979 Multipurpose Sequential Samplers. W.R. Parker and N.A. Huey.  
J. Air Poll. Control Assn. 17, 388-391 (June, 1967).

Versatile and adequately complete sequential sampling units can be fabricated from commercially available parts. Such sequential sampling systems are not complicated and can be adapted for individual needs. A variety of sampling tubes can be used, depending upon the specific requirements of sampling. Sampling impingers and bubblers that are interconnected by a manifold must contain air expansion-liquid traps in order to prevent sample mixing. -- Authors' summary

- 980 Is Dust the Stone Industry's Next Major Problem? M. Hankin, Jr.  
Rock Prod. 70, 80-84, 110 (April, 1967).

The special problems of the stone producers include: airborne dust from unpaved plant roads; dust from wind action on fine material stockpiles; and dust from crushing, screening, conveying, and stockpiling of crushed stone. The control of the dust emissions involves more of an investment than a technical problem. For dusty plant roads, calcium chloride, used motor oil fuel oil, or dust oil will control the road dusts at costs from 10 to 15 cents per square yard per year. Wetting agents and fine water sprays are stated to be the simplest, least expensive means of controlling dust at crushing and screening operations. The various dust collecting systems are reviewed with pictures of commercial collectors.

-- APCA Absts.

- 981 Changes in the Respiratory Organs due to Grain Dust. S. A. Stepanov and M. I. Karpova.  
Sov. Med. 29, 65 (1966).

An appreciable excess of maximal permissible concentrations of grain dust at work places of grain cleaners, grain-collecting stations, grain elevators and flour mills provokes in workers engaged therein dust-induced pulmonary affections. In the development of pulmonary pathology due to inhalation of dust, an important place is assigned to vegetable particles in the dust.

-- Diseases of Chest Abst.

- 982 Overinflation of the Lungs in Coal Miners. C. Ogilvie, K. Brown and W. E. Kearns.  
Brit. Med. J. 3, 10-13 (July 1, 1967).

The physiological findings in 17 coal miners referred to a pulmonary function laboratory because of unexplained dyspnea are compared with the findings in 15 patients referred with chronic nonspecific lung disease and 5 normal subjects of the same age group. Although the two groups of patients showed a comparable increase in residual volume, expiratory airways obstruction and impairment of gas transfer were considerably less in the group of miners. It is suggested that physiological tests can help distinguish disability due to coal dust from that associated with chronic nonspecific lung disease.

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

- 983 Apparent Onset of Coal Workers' Pneumoconiosis After Leaving the Mines. N. K. Coni  
Brit. J. Ind. Med. 24, 243-246 (July, 1967).

The case history is reported of a former coal-miner who, on admission to hospital with acute bronchitis, was found to have a chest radiograph suggestive of pneumoconiosis. However, the film taken on leaving the mines some four years previously was unremarkable, suggesting that the disease had either started or progressed during his four years away from the mines. Among the alternative explanations considered is the possibility that the diagnosis was in error and that the appearance was due to some radiologically similar disease which had chanced to affect an ex-miner. Some of the technical pitfalls inseparable from reliance on radiology are also mentioned as the appearance of progression may have been illusory. Other possibilities are that the disease was not the simple pneumoconiosis of coal-workers but some other form of pneumoconiosis, such as Caplan's syndrome or silicosis, in both of which the natural course of the illness may be quite different. Nevertheless, although it is clear that coal-workers' pneumoconiosis does not normally progress once the subject is removed from the mines, the possibility remains that in a small number of cases it may do so.

-- Author's Abst.

- 984 Investigation of a Minor Asbestos Hazard. M. C. S. Kennedy and R. Routledge.  
Brit. J. Ind. Med. 24, 232-239 (July, 1967).

Twelve men who had been exposed to a minor asbestos hazard have been examined clinically, radiologically, and physiologically, and an assessment of the airborne asbestos concentration has also been made. Ten men had worked in a transformer department lagging transformer windings with asbestos paste for between 15 and 37 years. Two of these men showed minor radiological and minor physiological changes suggestive of early asbestosis. Two insulation workers had been engaged in milling and sawing asbestos sheets for five and 23 years respectively; both men showed minor radiological and abnormal physiological changes. These two men had been exposed to higher airborne concentrations of the asbestos dust than the transformer men. It is impossible to be dogmatic concerning the aetiology of these pulmonary changes, and further follow-up studies are planned. However, the findings are presented in view of the recommendation by Gilson (1966) that more evidence is required concerning possible pulmonary changes in men exposed to low concentrations of asbestos.

- Author's Abst.

# PHYSICAL ASPECTS OF THE ENVIRONMENT

- 985 Air Embolism as Cause of Death in Scuba Diving in the Pacific Northwest. F.R. Smith  
Diseases of Chest 52, 15-21 (July, 1967).

Air embolism is suspected to be at least a prime cause of scuba fatalities in the Seattle area. This tragedy can occur at less than 15 feet submersion. It is suggested that partial bronchial obstruction in a segmental or subsegmental bronchus acts as a ball-valve, permitting with each successive inspiration greater distal distention. Rupture of the alveoli results in air entering torn veins, proceeding to the heart from there. Air embolism in the coronary and cerebral vessels causes anoxia and death. A thorough investigation of every scuba death in the Puget Sound area of the Pacific Northwest is being carried out. Whereas immediate recompression is the only practical treatment of these casualties, elimination of students of scuba diving whose history, physical examination, and chest roentgenograms show hazardous bronchial changes is a vital preventative step. Adequate instructions plus a proper examination can reduce these accidents to a rarity.

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

# RADIOACTIVITY AND X-RADIATION

- 986 Radiological Health Aspects of Oil Well Logging. N. Geiger and R. T. Moore.  
Public Health Repts. 81, 1064-1070 (Dec., 1966).

Radium-beryllium neutron sources in a logging tool are potentially more hazardous than plutonium-beryllium sources; however, radiation exposure can easily exceed the maximum permissible dose to workmen if precautions are not carefully followed. Since relatively large sources of radium and by-product materials are used under field conditions, widespread contamination could result from an accident, and emergency procedures as well as normal operating procedures should be established by the logging companies. There are 10 references.

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

- 987 The Risk of Bone Cancer in Man From Internally Deposited Radium. G. Hems.  
Brit. J. Radiol. 40, 506-511 (July, 1967).

From an analysis of data on persons exposed in the United States to radium it is estimated that 100 microcuries introduced into the bloodstream over a period of a few months or years would lead to an incidence of one bone tumor per 20 persons exposed. The tumors would be expected to appear at around 15 to 30 years after exposure. For full occupational exposure to radium during a 50-year working life the risk of induction of a tumor is estimated to be about one per 1,200 persons exposed. This value was derived on the assumption that the tumor incidence would be the same as for a single intake of the same total amount of radium. It is likely to be an overestimate.

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

- 988 Late Changes in the Peripheral Blood After Thorotrast Administration. A.O. Langlands and E.R.D. Williamson. Brit. Med. J. 3, 206-207 (July 22, 1967).

Thirty-five persons who had received intra-arterial thorium dioxide suspension (Thorotrast), 19 or more years previously, were examined. In all patients the hemoglobin level, white cell count, and platelet count were within the normal range; peripheral blood film showed a striking disturbance of red cell morphology. There was a varying degree of anisocytosis, occasional macrocytosis and burr cells; target cell and stipple cells were present. Giant platelets were a common finding and Howell-Jolly bodies were present in the erythrocytes of all but one of the patients examined. In the absence of splenectomy, and when hematological examination is otherwise normal, such findings are extremely rare and their significance is twofold: first, they may be of diagnostic significance, and secondly, they are probably indicative of a progressive loss of splenic function in patients exposed to thorium dioxide suspension.

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

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## ENVIRONMENTAL MEASUREMENTS

- 989 The Absorption of Atmospheric Sulfur Dioxide by Water Solutions. F. P. Terraglio and R. M. Manganelli. *J. Air Poll. Control Assn.* 17, 403-406 (June, 1967).

Results of a laboratory study indicate that the rate of solution of atmospheric sulfur dioxide in distilled water, over the range of atmospheric concentrations of 0.81-8.73 mg. SO<sub>2</sub>/cu. m., is a function of the concentration of SO<sub>2</sub> in the atmosphere, with saturation being reached more rapidly at the higher concentrations. This would indicate that rain water, with constantly renewed surfaces, can be very effective in the removal of atmospheric SO<sub>2</sub>. The pH of the exposed water samples reached values of 4.0 or less, comparable to values observed in fog and cloud water near large industrial areas. Overall solubility of sulfur dioxide in distilled water did not follow the law of partial pressure. At the atmospheric concentrations used it was found that over 98.5% of the sulfite in solution was in the form of the bisulfite ion with the remainder present as unionized sulfurous acid. Computations using the concentration of unionized sulfurous acid in the solution showed that the solubility of this portion of dissolved sulfite did follow the law of partial pressure. There are 13 references. -- Authors' abst.

- 990 Spectrophotometric Determination of Beryllium in Airborne Dust Samples. J. P. McClosky. *Microchem. J.* 12, 40-45 (1967).

A simple, rapid, and accurate spectrophotometric procedure for the determination of beryllium in airborne dust samples has been developed, with aluminon reagent used for color formation. The use of a complexing buffer solution containing one complexing and two chelating agents improves on the specificity of previous methods. In contrast to the Zenia method which has a lower limit of 2.5 micrograms, the present procedure is much more sensitive and affords accurate results for beryllium contents as low as 0.3 microgram. Also, the procedure is rapid, as many as 40 samples having been analyzed in a normal 8-hour work period by a single analyst. -- Author's summary, APCA Absts.

- 991 Determination of Traces of Lead in Air by Atomic Absorption Spectrometry. G. Thilliez. *Anal. Chem.* 39, 427-432 (April, 1967).

In a new type of burner designed to monitor lead in an industrial atmosphere, the air to be sampled is directly supplied to the burner of an atomic absorption spectrophotometer. The determination is rapid, monitoring is continuous, slight leaks are detected, and safety is improved. The limit of detection is 10<sup>-6</sup> gram per cubic meter. Six references are given.

-- Public Health Eng. Absts.

- 992 Determination of Trace Amounts of Organic Lead in Air Composite Sample Method. L. J. Snyder. *Anal. Chem.* 39, 591-595 (May, 1967).

A composite sampling method has been developed for measuring trace quantities of organic lead in ambient air. The mean error of the method is +0.001 microgram/cu. m. and the precision (standard deviation of the difference between the quantities found and present in known samples) is +0.004 microgram/cu. m. of air. The method consists of collecting a large air sample (100-200 cu. m.) by passing it through an activated carbon scrubber for a period of 2-4 days. Organic lead collected in the activated carbon is decomposed, extracted from carbon, and colorimetrically measured by a single extraction dithizone method. Interference from particulate lead is eliminated by effective filtration prior to collecting organic lead. The average quantity of organic lead found in ambient air in Los Angeles for a 6-week period of time was 0.078 microgram/cu. m., or approximately one one-thousandth of the maximum allowable limit of 75 micrograms/cu. m. air for an 8-hour exposure. The method is of sufficient accuracy to detect changes in the organic lead content of the atmosphere at this low level.

-- Author's abst., APCA Absts.

- 993 Technique for Detecting Lead Particles in Air. G. M. Morgan, Jr. *Nature* 213, 58-59 (Jan. 7, 1967).

This communication describes preliminary trials of a new method of detecting lead particles, based on the activity of lead iodide as an ice nucleating agent. Results suggest that this technique may be useful in monitoring air pollution, but it remains to be shown, however, that what is being counted is lead. -- Public Health Eng. Absts.

- 994 Spectrophotometric Determination of Primary Aromatic Amines with Thiotriethiazyl Chloride. Application to Determination of Toluene-2, 4-Diisocyanate in Air. V. Levin, B.W. Nippoldt, and R.L. Rebertus. *Anal. Chem.* **39**, 581-584 (May, 1967).

Highly colored intermediates form during the reactions of thiotriethiazyl chloride with some primary aromatic amines. The molar absorptivities range from about 21,500 liters mole<sup>-1</sup> cm<sup>-1</sup> for the red product from m-phenylenediamine to about 300 liters mole<sup>-1</sup> cm<sup>-1</sup> for the green product from aniline. Rapid color development is achieved at room temperature either by direct combination of solid thiotriethiazyl chloride with a solution of the amine in methanol-chloroform, or by percolating the amine solution over a bed of thiotriethiazyl chloride mixed with dry sand. Although the colored species generally decompose within a few minutes, linear calibration curves are readily obtained by controlling reaction conditions. These observations have been applied to the determination of airborne toluene-2, 4-diisocyanate at concentrations as low as 0.01 ppm by volume.

-- Authors' abst., APCA Absts.

#### PREVENTIVE ENGINEERING

- 995 Eliminating Sulfur Oxides From Combustion Gases by Adsorption Coke. H. Dratwa. *VDI Z.* **109**, 148 (Feb., 1967). German.

Experiments have been conducted in order to develop a "dry" method for the removal of sulfur dioxide from combustion gases by means of adsorption coke. Oil or coal combustion gases reacted in the presence of activated carbon or semi-coke from hard coal and peat from 3 to 25 seconds at 80 to 160°C. Sulfur dioxide was adsorbed in two distinct steps: (1) a fast physical adsorption, and (2) a slow change of SO<sub>2</sub> into SO<sub>3</sub> or H<sub>2</sub>SO<sub>4</sub>. This reaction takes place only in the presence of oxygen and water vapor, whereas for higher concentrations of SO<sub>2</sub>, O<sub>2</sub>, and H<sub>2</sub>O, longer reaction duration and lower temperatures improved the adsorption. An influence of grain size could not be detected. The adsorption coke was reactivated by heating to 450°C., whereby the adsorbed sulfuric acid was reduced. Large temperature differences between the gas and the adsorption substance indicate a partial evaporation of the adsorbents.

-- APCA Absts.

- 996 A Study of a Method for Desulphurising Fuel Gases. A.J.E. Munro and E.G. Masdin. *Brit. Chem. Eng.* **12**, 369-373 (March, 1967).

Several methods have been proposed to combat the nuisance caused by the presence of sulfur dioxide in flue gases: some are in operation while others are being evaluated. One approach is to treat the fuel containing sulfur by a partial combustion process thereby converting the sulfur content to hydrogen sulfide and removing this before combustion of the fuel. The article reports a catalytic process developed for this purpose which recovers more than 90% of the sulfur present as the element. The conversion of hydrogen sulfide to sulfur over periods where the catalyst retains its activity is predictable. Of the two catalysts used in the investigation a molecular sieve type proved the more effective.

-- Authors' abst. APCA Absts.

- 997 A Cooling System for Impermeable Clothing. J.P. Gleeson and J.F. Pisani. *Brit. J. Ind. Med.* **24**, 213-219 (July, 1967).

A self-contained conditioning unit for use with impermeable protective clothing is described. The pack-mounted unit weighing 10 lb. (4.5 kg.) will enable a wearer to work for approximately one hour at temperatures in the zone of evaporative regulation. At 40.6°C. (105°F.), the temperature at which the unit was tested, the heat load imposed by the complete assembly of suit, conditioning unit, and ducting is only slightly higher than that imposed by the wearing of shorts.

-- Authors' abst.

- 998 Possibilities for Exhaust Air Cleaning in Pressure Die Casting Foundries. K. Wagner. *Giesserei* **54**, 150-152 (March 16, 1967). German.

Substances used for sizing and lubricating in pressure die casting, such as mineral oils and aluminum powder cause considerable air pollution hazards to the operating crew. Therefore, effective exhaust hoods with subsequent dust and mist removal must be employed. Because suspended particles of fats and oils have a tendency to condense in the exhaust pipes creating a fire hazard, the dust removal plant must be close to the hoods. Where this is not possible,

prefiltering by wire nettings built into the hoods proved advantageous. Forty-five per cent of the pollutants, mostly the coarser materials like aluminum, dust, and fats are retained by the netting while substances such as oil and soot reach an electrostatic filter. Extensive tests on the system, performed in southwest Germany, indicated a 98% efficiency. Venturi-washers could also be used instead of electrostatic filters but wet-washers (wet-cyclones) proved insufficient.

-- APCA Absts.

### COMMUNITY AIR HYGIENE

- 999 Atmospheric Corrosion Studies in Two Metropolitan Areas. J. B. Upham.  
J. Air Poll. Control Assn. 17, 398-402 (June, 1967).

Atmospheric corrosion studies using established air monitoring network sites were conducted in metropolitan St. Louis and Chicago to obtain information on the quantitative relation between mean pollution levels and corrosion losses. These studies provide additional evidence to reinforce the thesis that air pollution is a significant factor in promoting and accelerating corrosion of ferrous metals. Good correlations were found between measured corrosion losses and corresponding sulfur-related pollutants at all exposure sites. No apparent relationship exists between corrosion losses and corresponding dustfall measurements in metropolitan St. Louis. The influence of suspended particulate matter on the magnitude of corrosion was found to be insignificant in Chicago. Corrosion differences between exposure sites having equivalent pollution levels are best explained by variations in nocturnal-heat radiation resulting from non-uniform site locations. Although short-term corrosion studies, such as these, may be used to provide a rough assessment of the corrosion potential of particular sites, a more reliable estimate would necessitate studies lasting from 3 to 5 years. There are 8 references.

-- Author's conclusion, modified

- 1000 The Effects of Photochemical Oxidants on Materials. L. S. Jaffe.  
J. Air Poll. Control Assn. 17, 375-378 (June, 1967).

The excessive cracking of rubber products was one of the earliest indicators of the presence of atmospheric photochemical oxidants. It has been demonstrated that this excessive cracking of rubber is caused by atmospheric ozone formed in the photochemical smog formation process. Depending on the formulation of the rubber, cracking under stress can readily be detected within 3/4 hour with atmospheric oxidant levels as low as 0.03 ppm. Natural and certain synthetic rubbers are particularly vulnerable. These rubbers when stressed show cracking when exposed to 0.02 ppm. laboratory ozone for about one hour. Other materials known to deteriorate under atmospheric photochemical smog conditions are textiles and certain dyed fabrics, particularly under conditions of high humidity. Loss of tensile strength of cotton textiles when wet or moist, and similar fading of these dyed fabrics, particularly under high humidity, can be also produced by laboratory exposure of these textiles to pure ozone. Ozone effects on asphaltic materials are also reported. There are 29 references.

-- Author's abst.

- 1001 Fabric Deterioration: A Test Chamber for Exposure of Fabrics to a Contaminated Atmosphere.  
Jane Peters and Dorothy Saville. Am. Dyestuff Reprtr. 56, 27-29 (May 8, 1967).

White nylon, polyester, cotton, acetate, and fiberglass curtain marquisettes were exposed to a high ozone atmosphere and light to determine the effect of the exposure on breaking strength of the fabrics. Specimens were exposed in an especially designed test chamber and tested for breaking strength at 9-day periods for 45 days. The entire experiment was replicated to provide a better evaluation of the degree of reliability of the data and of the consistency in operation of the test chamber. The data were analyzed as a split plot and double replicate design. Nylon and polyester fabrics had a significant loss of strength, and the loss of strength of the acetate fabric was also significant. Variance of the fiberglass marquisette data was high, and their analyses indicated the sample size was inadequate for a reliable measure of strength of the fabric. No significant differences were found between the left and the right sides of the test chamber or between the first experiment and the replicated experiment.

-- Authors' summary modified, APCA Absts.

- 1002 Control of Contaminant Emissions From Fossil Fuel-Fired Boilers. R.E. George and R.L. Chass. J. Air Poll. Control Assn. 17, 392-395 (June, 1967).

The importance of fuels combustion was brought into sharp focus recently in a report on air pollution to the United States Senate in which it was stated, "These processes replace usable air with potentially harmful pollutants, and the capability of the atmosphere to disperse and dilute these pollutants—especially in urban areas where people, vehicles, and industries congregate in even greater numbers—is strictly limited." The overwhelming burden of emissions of sulfur compounds, as well as nitrogen compounds and particulate matter in the U.S. today, originates from the burning of coal and fuel oil in stationary combustion sources. Thus, combustion has a large influence on the quality of the atmosphere in most urban areas. The air pollution effects of these contaminants are many and varied and all are objectionable and undesirable. Without a doubt, the most serious air pollution problem in the nation today is that created by the combustion of fossil fuels. There are 6 references. -- Authors' abstr.

- 1003 The Search for Low Sulfur Coal. H. Perry and J.A. Decarlo. Mech. Eng. 89, 22-28 (April, 1967).

Solutions to problems of sulfur oxides from coal such as: low-sulfur coal, sulfur reduction in coal, and removal of the sulfur oxides from the flue gas are available, but at a high cost. The largest reserves of low-sulfur coals are in the West in areas of low demand or held "captive" by the steel industry which can pay premium prices. None of the methods for removing organic sulfur from coal such as solvent extraction, liquefaction, gasification, chemical, or bacterial treatments are low enough in cost to warrant commercial exploitation. Removing pyritic sulfur (40-80% of the total) involves fine crushing and separation at the point of use. Further research and development is needed before any of the separation methods such as magnetic separation, froth flotation, concentrating tables, or bacterial action could become commercial. The addition of limestone or dolomite during combustion offers promise of sulfur oxide reduction from 25-50% in existing plants. The costs of removal of the sulfur oxides from the flue gas by high-temperature methods such as the vanadium oxide oxidation process, the Reinfult process, and the alkalized alumina method are still quite high (\$0.75 to \$1.50 per ton of coal). This removal from the stack at high temperatures offers the most promising solution and new methods could reduce these costs. APCA Absts.

- 1004 What Plant Engineers Face in Closer Control of Air Pollution. L.C. Hardison. Plant Engr. 20, 142-146 (Nov., 1966).

Air pollution regulations will be more severe. Sophisticated analytical testing at the pollution source will be more common, air pollution authorities and local governments will continue to take into account not only the technical feasibility of solutions but also economics, use of high stacks will be less acceptable, air correction equipment will need to be replaced. Most air pollution control equipment will be specially designed. Accurate data cannot be overestimated. -- APCA Absts.

- 1005 Pulling "Petrochemicals" Out of Steelmakers' Stacks. Anon. Chem. Week 100, 58-60, 63 (Jan. 12, 1967).

The recovery equipment used to capture carbon monoxide in a closed hood as it emerges from the converter mouth of the basic oxygen furnace has become part of the steelmakers anti-pollution program. The recovered carbon monoxide can then be used for the production of petrochemicals. -- Public Health Eng. Absts.

- 1006 Energy Costs for Electric Cars. W.T. Reid. Hydrocarbon Process. Petrol Refiner 46, 185-190 (March, 1967).

Whether electric automobiles can be expected to take over a responsible part of our transportation load seems to depend a good deal at present on a single factor—providing enough energy to the vehicle to give it a satisfactory range at a reasonable cost. How much energy depends upon: vehicle weight, efficiency of converting energy to motive power, use pattern, and driver characteristics. Three options are available: secondary batteries which include conventional storage batteries and new types of rechargeable electrochemical devices; fuel cells which include gaseous and liquid fuels, and regenerative systems; and combinations of

a fuel cell and a secondary battery. A discussion of each and examples are given. Four tables also are given. Further scientific and engineering developments will be necessary to arrive at a suitable compromise between what the average motorist will want and what he can afford to pay.  
-- APCA Absts.

- 1007 Cleaner Air and the Gas Industry. L. Ourusoff.  
Am. Gas. J. 194, 26-30, 32, 34 (April, 1967).

The effect of air pollution on the gas industry and the potential impact of natural gas on the national air pollution control program are evaluated. Air pollution has progressed from a potential threat to an existing curse and is developing into a calamity. For space heating, the SO<sub>2</sub> ratio of electricity to gas=13,000:1, for air conditioning the ratio is 3,000: 5,000:1 where the electric plant is coal or oil-fired. For gas-fueled purchased electricity the ratio is 2:1 for the SO<sub>2</sub> when compared to gas used directly for space heating. Gas is the heating energy that combines maximum cleanliness with the minimum waste. The use of soft coal and heavy fuel oil for space heating in cities is no longer compatible with modern concepts of air pollution control. Electric decentralization is predicted with soft coal and heavy oil finding mine-mouth and oilfield-mouth generating outlets away from the city until effective and economical fuel purifying techniques become perfected. During the interim period, natural gas will be used for urban space heating, air conditioning, and hot water. A program of education is urged to emphasize the role of natural gas in air pollution control.  
-- APCA Absts.

- 1008 Availability, Quality and Present Utilization of Fly Ash. C.E. Brackett.  
Combustion 38, 39-45 (May, 1967).

This paper attempts to present basic data on current availability, quality, and use of fly ash. In doing this, the author points out a few of the problems presently facing the industry as a whole and suggests a few practical methods which can be used to solve some of these problems. He also emphasizes the need for much additional basic research data on fly ash so that a quality product can be produced and sold at all times and under all conditions.  
-- Author's summary, APCA Absts.

- 1009 The Influence of Vehicle Operating Variables on Exhaust Emissions. G.C. Hass, et al.  
J. Air Poll. Control Assn. 17, 384-387 (June, 1967).

This paper is a report of the operating variables and emission characteristics of a 1964-283 cubic inch V-8 Chevrolet automobile. This vehicle was used as a laboratory tool in a project to develop an improved driving cycle to represent Los Angeles peak hour driving. As a result it became necessary to run many exploratory tests to determine the relationships between the primary variables of intake manifold vacuum, engine rpm, and vehicle speeds and acceleration rates. Emissions of hydrocarbons, carbon monoxide, and nitrogen oxides were also determined for the entire range of operating conditions. The effect of prior operating modes on closed-throttle unburned hydrocarbon concentrations was also determined. The results of these tests are presented in tables and graphs which make a comprehensive picture of one typical automobile as a generator of air pollutants. Two references are given.  
-- Author's abst.

- 1010 III. Administration of Air Pollution Control Programs Within the State Government.  
P.W. Purdom. Am. J. Public Health 57, 281-286 (Feb. 1967).

The range in sharing responsibility between state and local government varies from Arkansas, where the state law prohibits local air pollution agencies, to states such as Colorado and Ohio where the state is invested with the authority to control sources of air pollution in cities and counties. The state programs in California, New Jersey, New York, Ohio and Pennsylvania were selected as typical for this discussion. In the approach to the administration of programs, classical program planning is preferable to blindly following other states. The states with some notable exceptions have lagged in developing air pollution control programs. The need for state programs to provide assistance to local programs where needed and to service problem areas where necessary is apparent.  
-- APCA Absts.

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- 1011 Federal Abatement of Intrastate Air Pollution. A.T. Rossano, Jr.  
Foundry 95, 129-30, 133 (April, 1967).

It is apparent that the intensity of air pollution is growing at a faster rate than efforts to control the problem. More effective and imaginative measures must be taken if this nation is to overtake and reverse that trend. The question is, "Who is to provide the dynamic leadership for the needed forward thrust?" If state and local governments continue to lag in their pollution control efforts, undesirable consequences can ensue. Air quality will deteriorate to critical levels, aroused local citizenry will lose its patience and begin to press unreasonable demands. Resulting control actions may be based more on emotion and expediency than on calculated need. The end result could be chaotic. If and when such a situation begins to emerge, we may anticipate that the Federal government will feel obliged to enter the scene and provide the needed leadership. It is difficult to predict what form of action the Federal government would take in this hypothetical case, but it is quite likely that it will encroach further in the realm of intrastate abatement.

-- Author's summary, APCA Absts.

- 1012 Alkaline Material Liberated into Atmosphere From New Concrete. K. Toishi and T. Kenjo.  
J. Paint Technol. 39, 152-155 (March, 1967).

Because of the interest in the damage to certain materials from the odor-producing substance present in the air of newly constructed concrete storage rooms, an investigation was made of the air contaminant. There is present in the vicinity of fresh concrete a detectable amount of alkalinity that can hasten the deterioration of certain materials such as art objects, silk, hardened linseed oil, leather, pigments and dyes. Spectrographic analysis of material collected from the air shows a composition similar to that of concrete. If the walls are covered with varnish, the deterioration from the alkalinity will be minimized. Natural aging or neutralizing of the surface layer of the concrete wall with carbon dioxide should be helpful. It is indicated that the material in the air must be in a highly-dispersed state approaching molecular dimensions.

-- APCA Absts.

- 1013 Histologic Appearance of the Lungs in Experimental Animals Exposed to Welding Fumes.  
Z. Garnuszewski and W. Dobrzynski. Gruzlica 34, 5 (1966).

Experiments were made in guinea pigs and rabbits with the aim to determine toxicity of welding fumes produced with the use of electrodes, type EO 52-28P, containing 25% of SiO<sub>2</sub> and type EP-47-SP, containing 8% SiO<sub>2</sub>; these types of electrodes are used in the Warski shipyard in Szczecin. The animals were kept for three to six months in an inhalation chamber especially constructed for the purpose of the experiment and the concentration of the fumes was made identical with that in workshops where the welders worked. The animals were sacrificed. Microscopic lesions in the lungs of the animals exposed to inhalation of the fumes of EP 52-28P electrode corresponded to the lesions seen in siderosis and silicosis; in the animals exposed to the fumes of EP 47-28P electrode, siderosis of the lung was found.

-- Diseases of Chest Abst.

#### MANAGEMENT ASPECTS

- 1014 The Socio-Economic Implications of Industrial Safety. P.J. Tuz and N.J. De Grazia.  
J. Am. Soc. Safety Eng. 12, 21-24 (Sept., 1967).

In view of the economic, social, and political aspects of industrial safety the authors wish to express the following conclusions: (1) Industrial. (a) A keen awareness of increments to accident rates on the part of management and labor should be most prominent during periods of industrial expansion or increased production rates. (b) The duration of training periods for new employees should remain as close to its "normal" level as possible during expansionary periods. (c) Industry should insure that the standards and caliber of its industrial safety personnel is on a comparable level as possible during expansionary periods. (2) Labor. (a) Labor should accept the moral responsibility of facilitating conscientious management in their efforts in the areas of industrial safety. (b) Organized labor should insure that its industrial safety advisors or staff members should be of comparable caliber as other professional functions. (3) Government. (a) Government should provide encouragement for voluntary efforts in industrial safety. (b) Individual states should promote safety engineering as a profession and insure that state colleges and universities make available a curriculum in safety engineering. This would

provide industry with a source of trained manpower in the area of industrial safety. A precedent has been set by the Institution of Industrial Safety Officers (Great Britain), which requires examination for admission.

-- Authors' conclusions

- 1015 Individual Variations in Sickness Absence. P.J. Taylor.  
Brit. J. Ind. Med. 24, 169-177 (July, 1967).

Records of personal sickness absence, including all spells of one day's duration or more, have been kept at a refinery for more than 20 years. The distributions of sickness spells and also calendar days of absence have been analyzed for single years and also for periods of up to 20 years' continuous service for the 1,350 hourly paid male employees. It is shown that both these measures of sickness absence are distributed among the men in an unequal fashion (negative binomial) rather than at random (poisson) and thus resemble the distribution of industrial accidents first described almost 50 years ago. This pattern of distribution is not related to occupation or to length of service. Analysis of the distribution of lateness and absenteeism for reasons other than sickness or holidays shows that these also follow this pattern. It is postulated that this could be a principle applicable to all forms of industrial absenteeism as well as to accidents. The personal records of 187 men with continuous service from 1946 to 1965 have been studied to investigate the trends in their sickness absence over this 20-year period. In contrast to the well-recognized pattern that in any one period of time young men have more spells of absence than their older fellows, this secular study shows that sickness spells have not decreased with age. This apparent paradox is explicable by the rising national trend in sickness absence and by a high labor turnover in young men with frequent sickness spells.

-- Author's abstr.

#### ACCIDENTS AND PREVENTION

- 1016 Motor Accident Mortality and Compulsory Inspection of Vehicles. V.R. Fuchs and I. Leveson.  
J. Am. Med. Assn. 201, 657-661 (Aug. 28, 1967).

The relation between motor accident mortality and compulsory vehicle inspection is examined by regressing age-standardized mortality ratios on inspection and other variables across states. The adjusted coefficient of multiple determination is typically about 0.85. Inspection is negatively related to mortality, but the net effect of inspection is less than one third as large as the gross difference between states that require inspection and those that do not and does not generally differ from zero at high levels of statistical significance. The effect of inspection appears to be greater in states with more than one annual inspection. It is greater in low income than in high income states, and greater in high education than in low education states. Dollar estimates of the benefits of inspection are found to exceed estimated costs; the difference, however, is not as large as is often alleged. The reader who might object that the saving of life is worth any cost should recall that the choice need not be between saving lives and not saving them, but between alternative programs. The \$250 million annual cost of a compulsory vehicle inspection program could be used in other, perhaps more effective, life-saving programs such as stricter licensing procedures, enforcement of speed limits, elimination of road hazards, etc. We second Buxbaum and Colton's conclusion that the techniques and experience of many disciplines are needed to deal with the complex socioeconomic factors relevant to motor accident mortality.

<sup>1</sup> Buxbaum, R.C. and Colton, T.: Relationship of Motor Vehicle Inspection to Accident Mortality, JAMA 197, 31-36 (July 4) 1966.

#### MISCELLANEOUS

- 1017 Solid-Waste Disposal in Chemical Plants. R.J. Bender.  
Power 111, 65 (March, 1967).

A survey of the use of incinerators by chemical plants (46 replies from 195 questionnaires) indicated that although very few companies use incinerators, 25% are seeking a solution to their solid waste disposal problems.

-- Public Health Eng. Absts.

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