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Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL

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INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE -- PITTSBURGH, PA. 15213

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INDUSTRIAL HYGIENE FEATURES

For information on the National Congress on Environmental Health Management see Abst. No. 1024.

The war on disease in Vietnam—see Abst. No. 1025.

High-purity chromium wire used in cancer therapy is discussed in Abst. No. 1026.

For new FDA regulations on vitamins see Abst. No. 1034.

Pleural plaques and asbestos exposure are discussed in Abst. Nos. 1036 and 1083.

The appraisal of emotionally disturbed employees by the industrial physician is discussed in Abst. No. 1040.

For discussion of Management in Medicine consult Abst. No. 1043.

A ten-year resurvey of Industrial Hygiene Services in Industry is the subject of Abst. No. 1048.

Malaria in Pennsylvania is investigated in Abst. No. 1061.

Abst. No. 1065 discusses treatment of farmer's lung.

Abst. No. 1067 discusses the use of ice water in the treatment of burns.

A study of the carcinogenicity of epoxides, lactones, and peroxy compounds is given in Abst. No. 1071.

A discussion of absorption and excretion of mercury in miners is presented in Abst. No. 1074.

The BOP air cleaning experiences are given in Abst. No. 1087.

Community noise as an environmental hazard is described in Abst. No. 1092.

Environmental heat studies are considered in Abst. No. 1094.

An automatic carbon monoxide monitor is described in Abst. No. 1102.

FOUNDATION FACTS

STAFF ACTIVITIES: Dr. Paul Gross presented, and Drs. William Rinehart and Robert T.P. deTreville discussed the subject, "Pulmonary Response to Toxic Gases" at the November 8 Departmental Seminar at the University of Pittsburgh, Graduate School of Public Health, Department of Occupational Health. Dr. Gross spoke at the National Academy of Sciences, National Research Council Committee on Toxicology Annual Meeting on November 9 in Washington, D.C., and also addressed a meeting of the American Petroleum Institute Environmental Health Committee on November 11. He also attended a meeting of the American Conference of Governmental Industrial Hygienists Threshold Limit Value Committee in Washington, D.C. on November 15-16. Drs. Gross and deTreville met with Drs. G.A. Webb, T. Harrison Davies, R.V. Rice, and L. Vassamillet, of Mellon Institute, to plan electron microscopic and electron probe support for an extension of the Foundation's long-range fibrous dust study begun July 1, 1966 (outlined in the Medical Series Bulletin No. 11, now in distribution). Arrangements are being made for a visit by Dr. J.M.G. Davis of Queens College, Cambridge, England, in an advisory capacity at an early date (perhaps before the end of the year). In addition, steps are underway to employ a full time electron microscopist and a technician assistant on or about January 1, 1967. Dr. deTreville and Professor Hatch met with Dr. Steger and Alan Colker of CONSAD to discuss Industrial Hygiene Program Budget planning.

FOREIGN VISITOR: Dr. Kyu Sang Cho, Vice President of the Korean Industrial Health Association, visited IHF Headquarters on November 8 and made a brief tour of Mellon Institute.

ENGINEERING COMMITTEE ACTIVITIES: One of the new activities of the Engineering Committee which should prove to be of great service to the engineers of IHF member companies is the publication of an "Information Exchange Capsule." Member companies will be contacted in the near future with regard to this new service. Announcements of the Foundation's 3rd Engineering Discussional, to be held at the Sewickley Inn, Pittsburgh, January 10-12, 1967 are in process of distribution.

NURSING COMMITTEE: Iva Pleasants, R.N. (American Institutes for Research) of the Foundation's Nursing Committee attended a course in Nursing Practices and Occupational Mental Health, November 14-18 in Bethesda, Maryland, held by the U.S. Public Health Service. (See Industrial Hygiene Digest, Foundation Facts, 30:3, March 1966.)

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EDITORIAL

FRYE REPORT¹

America's workers represent 40% of the population and pay 60% of the taxes, yet 80% work in places where no health service is provided, and in the remaining 20%, protection varies from excellent to minimal.

The proposed national program in occupational health has as its goal: (1) elimination or control of any factor in the work environment which is deleterious to the health of workers, and (2) promotion of good health and well-being as well as prevention of illness among workers.

On August 18, 1965, President Lyndon B. Johnson said "Reduction of one day in the annual rate of sick absence among American workers would add \$10 billion to the Gross National Product." Earlier, on June 21, 1965, the President announced new guidelines for Federal Employee Health Services, designed to make the Federal Government a model employer in this regard.

The following official and non-official bodies have recommended action to fill this national need:

1. The Conference of State Sanitary Engineers which called for expansion of occupational health in the USPHS.
2. The Association of State and Territorial Health officers which recommended strengthening occupational health at all levels of government.
3. The Group Health Association of America, Inc. which pointed to the lack of adequate support for occupational health from government, management and labor.
4. The Surgeon General's Advisory Committee on Occupational Health.
5. The National Advisory Environmental Health (NAEH) Committee.
6. The National Advisory Health Council which advised the Surgeon General to take action to implement the recommendation of the NAEH.
7. The House Subcommittee on Appropriations which ordered the report of the National Advisory Environmental Health Committee be made a part of its 1965 Report of Hearings.
8. The American Public Health Association which recommended that the USPHS take leadership in developing a program of occupational health with national goals and missions that meet today's needs.

Recognizing the need for a thorough study, the Division of Occupational Health of the United States Public Health Service requested Drs. Frye² and Ashe³ to prepare this report. The recommendations of this report are organized under the following headings:

1. Placement of Specific Legislative Responsibility in the Division of Occupational Health (DOH).
2. Strengthening of State Occupational Health Programs.
3. DOH develop Criteria for Federal Exposure and labelling standards.
4. DOH to direct occupational health services for Federal employees.
5. DOH have role in promulgation of Walsh-Healey Health and Accident Provisions.
6. DOH to develop standards for occupational health programs in all institutions receiving Federal grants and contracts.
7. DOH to enforce Federal health standards for workers in interstate transportation.
8. DOH demonstration grants to stimulate new and effective methods designed to bring occupational health services to all American workers, regardless of location and size of plant.
9. DOH to expand in-house and extra-mural research efforts.
10. DOH to establish occupational health clinics in United States Public Health Service hospitals and support such facilities in universities and community establishments.
11. DOH to expand programs to measure the National Occupational Health Problem and anticipate new problems with provision for right-of-entry where there appears to be serious threat to health and refusal to cooperate.
12. DOH to develop manpower and skills needed to staff such a national program of occupational health.
13. DOH will create an effective national resource for the accumulation and dissemination of occupational health knowledge.
14. DOH to expand public information and educational activities, including a National Conference on the Health of the Worker.
15. DOH would insure continuous program review by establishment of a Scientific Advisory Committee.
16. Minimum annual cost of the program will be \$50 million, with the following budgetary breakdown:

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Research Grants	\$10 million
State Program Grants	\$ 8 million
Fulfilling Federal Responsibilities	\$ 7 million
Personnel Development	\$ 2 million
Demonstration Grants	\$ 2 million
In-house Research	\$12.5 million
Technical Services	\$ 5 million
Federal Employee Health Services	\$500,000
Migrant Health Service	\$500,000

17. Legislative and Administrative action required in support of DOH includes an Inter-Departmental Committee on occupational health and an Inter-Agency Committee to be established within the Department of HEW in order to coordinate all Federal efforts.

The following is a partial list of urgent problems, by topic heading only, under each of which there will apparently be well-developed investigations.

Genetics	Enzymology
Synergistic Action of toxic agents and physical environment	Pneumoconiosis
Beryllium	Asbestos
Exotic Fuels	Cotton Dust
Heavy Metals	Trichlorethylene
Personal Exposure Meter	Agricultural Toxicology
Industrial Carcinogenesis	Carbon Monoxide
Noise	Occupational Skin Disease
Artificial Environments	Physical Agents
Occupational Mental Health	Sight
	Aggravation of Degenerative Diseases

-- RTP deT

¹ From a paper presented by Dr. Murray Brown, U.S. Public Health Service, Division of Occupational Health, at the American Industrial Hygiene Conference in Pittsburgh, Pa., May 16, 1966.

² Dr. William W. Frye, Chancellor of the Medical Center, Louisiana State University.

³ Dr. William Francis Ashe, Jr., Professor and Chairman, Department of Preventive Medicine, Ohio State University, College of Medicine.

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DR. JAMES H. STERNER, Medical Director of Eastman Kodak Company, was elected a member of the Industrial Hygiene Foundation's Board of Trustees on October 18, 1966 at the Foundation's 31st Annual Meeting of the Membership.

A graduate of Pennsylvania State University and Harvard Medical School, he interned at Lankenau Hospital in Philadelphia and also took his residency training there.

Dr. Sterner's career with Eastman Kodak Company began in 1936 with his appointment as Director, Laboratory of Industrial Medicine. In 1948, he became Associate Medical Director and in 1951, Medical Director of the Company. In addition to his work in industry, Dr. Sterner holds appointments at the University of Rochester School of Medicine where he is Clinical Professor of Preventive Medicine and Community Health, and also Clinical Associate Professor of Medicine.

The magnitude of Dr. Sterner's contributions to the field of environmental and occupational health is clearly manifested in the nature of the important offices he currently holds, which include the following: Chairman, American Board of Preventive Medicine; Chairman, Council on Environmental and Public Health, American Medical Association; Member, National Advisory Environmental Health Committee, U.S. Public Health Service; Chairman, Environmental Health Advisory Committee, Manufacturing Chemists' Association; Consultant in Occupational Health, U.S. Atomic Energy Commission; Chairman, National Air Conservation Commission; Member, Board of Directors, National Tuberculosis Association; Member, Committee on Occupational Health and Safety, International Labor Office; Member, Expert Advisory Panel on Social and Occupational Health, World Health Organization; Chairman, Executive Committee, Health Association of Rochester and Monroe County; Member, Executive Committee, Council of Social Agencies; and Member, Board of Directors, Health Council of Monroe County.

In addition, Dr. Sterner has served in the past as: President, National Health Council; President, American College of Preventive Medicine; President, American Academy of Occupational Medicine; President, American Industrial Hygiene Association; Chairman, Council on Occupational Health, American Medical Association; and Vice-Chairman, Advisory Committee for Biology and Medicine, U.S. Atomic Energy Commission.

Dr. Sterner's efforts in the field of industrial medicine have been widely recognized. He has been the recipient of the following awards: Knudsen Award from Industrial Medical Association for "The Most Outstanding Contribution to Industrial Medicine 1956-1957," Industrial Health Conference, St. Louis, Missouri, 1957; Cummings Award from the American Industrial Hygiene Association for "Outstanding Contributions to the Knowledge and Practice of the Profession of Industrial Hygiene, Industrial Health Conference, Buffalo, New York, 1955; Award of Honor from the American Academy of Occupational Medicine for outstanding service in the field of occupational medicine, Annual Meeting, Boston, Massachusetts, 1959; Albert David Kaiser Medal by the Rochester Academy of Medicine for distinguished service in occupational medicine and pioneering in the prevention of atomic radiation hazards, Rochester, New York, 1963; and 1963 Award for Exceptional Achievement in Preventive Medicine, Second General Session of the Annual Health Conference of the New York State Academy of Preventive Medicine, New York City, 1963.

Dr. Sterner's interests and accomplishments encompass the complete spectrum of industrial hygiene and the Foundation should benefit greatly from his participation in its management as a Trustee.

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INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

1024 National Congress on Environmental Health Management.

Under the direction of the American Medical Association a National Congress on Environmental Health Management will be held in New York City, April 24-26, 1967. This is the fourth in a series of such congresses on environmental health problems to consider the need for comprehensible environmental health services and an over-all approach to managing air, land, water and human resources. The AMA is convening this Congress to determine the feasibility of an over-all management approach and to explore, in depth, concepts, functions and responsibilities. Five panels are planned for the Congress: medical investigations to establish health goals; essentials of effective management; responsibilities and resources; management of wastes and resources; and the mission and tasks of medical societies. Further information about the Congress may be obtained from the Department of Environmental Health, American Medical Association, 535 North Dearborn Street, Chicago, Illinois 60610.

-- Am. Ind. Hyg. Assn. J. 27, 406 (July-Aug. 1966)

1025 War on Disease in Vietnam.

Bullets and battle wounds are not the only hazards to American soldiers in Vietnam. The country is infected with tropical diseases, some unknown to Americans. Medical treatment due to disease runs about three to one ahead of battle injuries. Col. James A. Wier, U.S. Army senior medical officer serving in Vietnam, reports that the capability of treating all illnesses is excellent and nearly matches treatment in the U.S. The most troublesome tropical diseases are malaria, parasites, typhus, leptospirosis, and parasitic afflictions. Plasmodium falciparum malaria struck large numbers of soldiers last fall, but suppressive drugs now bring rapid response and a low rate of relapse. Plague, typhus, and intestinal parasitism are being controlled by spray operations against carriers; tetracycline drug treatment has been totally effective when the diseases have been contracted. Cholera and tuberculosis are highly endemic among the Vietnamese; American servicemen are immunized against cholera, but the extent of the protection is not known. Manifestations of tuberculosis are uncommon; however, since the Americans are on one year tours of duty, infections may crop up after their return. The good health of Americans in Vietnam is attributed to the availability of drugs and good programs of research on diseases of Vietnam. The Walter Reed Army Institute research team and a health team from the Pasteur Institute have been investigating plague, malaria, enteric diseases, and neuroendocrine stress in Vietnam since 1963.

-- J. Am. Med. Assn. 197, 740 (Aug. 29, 1966)

1026 High-Purity Chromium Wire for Cancer Therapy.

High-purity chromium wire is being used successfully for cancer therapy research. Medical scientists at Argonne Cancer Research Hospital of the University of Chicago make the chromium wire (0.030 inch thick) radioactive, then inject short lengths (3/16 inch) of it into cancerous tissue of patients in an effort to retard or destroy the cancerous growth by radiation. Each patient is implanted with about 16 inches of wire, which is furnished by the Bureau of Mines. Dr. Melvin L. Griem of the university's department of radiology believes that the technique is promising enough to deserve more experimentation. Other radioactive metals have been used as cancer-therapy implants, but chromium wire is unique because it may be implanted permanently.

-- Chem. Eng. News 44, 47 (Oct. 3, 1966)

1027 Air Resources Engineering Program.

A five-year program in air resources engineering starts this fall at New York University, New York City. M.S. degrees are offered in civil engineering, chemical engineering, meteorology, and environmental health science, all with a strong minor in the field of air pollution. The objective of the program is to train engineers and scientists in the application of engineering, chemistry, and meteorology to the behavior and control of atmospheric pollutants, according to Dr. Alan H. Molof. The program will serve working personnel in industry, consulting offices, and government agencies as well as full-time or part-time students with backgrounds in either engineering or science. The program is supported, in part, by a \$424,000 grant from the U.S. Public Health Service.

-- Chem. Eng. News 44, 49 (Sept. 19, 1966)

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1028 Emphysema.

Deaths from emphysema in 1963 totaled 17,595, the U.S. Public Health Service reported. It was an increase of nearly 600% from the 1953 total of 3,010.

-- Chronic Illness Newsletter 17, 2 (Aug. 1966)

1029 German Firms Advised to Hire Industrial Physicians.

The Labor Ministry in the Federal Republic of Germany advised industrial firms to arrange to have the services of an industrial physician for every group of two to three thousand workers. Companies with less than two thousand workers should arrange to share such a service with other companies.

-- J. Am. Med. Assn. 197, 831 (Sept. 5, 1966)

1030 Safe-Driving Booklet.

A new safe-driving booklet that helps teach motorists how "to think" with their eyes instead of just seeing with them has been published by the National Safety Council. Titled Test Your See Power, the 12-page illustrated booklet shows eight, typical, potentially-hazardous traffic situations. Readers can put themselves in the driver's seat of the red car in each drawing to test whether their "see power" enables them to spot the hazard and avoid the accident that's about to happen. The answer to each problem is given on the next page. For a free single copy and prices on quantity orders, write on your company letterhead to the National Safety Council, 425 North Michigan Avenue, Chicago, Illinois 60611, giving the booklet title and stock number: Test Your See Power, No. 399.13.

-- Am. Ind. Hyg. Assn. J. 27, 352 (July-Aug. 1966)

1031 Standards for Chemical Food Additives.

The completed set of standards for chemical food additives has recently been published by the National Academy of Sciences. Five years in preparation, "Food Chemicals Codex" is an 832-page, \$25 compendium of specifications for more than 500 commonly used additives. Up to now, descriptions, purity standards, and purity measurement techniques for some additives were available on looseleaf sheets. The Food and Drug Administration says it will use the codex as a basis for setting "appropriate food grades" under certain sections of the Food, Drug, and Cosmetic Act.

-- Chem. Eng. News 44, 35 (Sept. 19, 1966)

1032 Freon-Dry Ice Cold Bath.

The National Aeronautics and Space Administration in their Technical Brief 66-10257 describes the technique and advantages of using Freon rather than acetone or other liquids with dry ice for constant temperature cold baths. Acetone or Freon with dry ice will provide a temperature of sufficiently close tolerance and will maintain it for one-half hour or longer; Freon, however, is to be preferred because of the possible violent reaction of acetone in the presence of oxygen. The freezing point of Freon is above the sublimation point of carbon dioxide, hence the Freon will actually freeze when carbon dioxide is first added. However, when mixed slowly by stirring, the Freon then reverts to a liquid state due to an unknown combination or possible eutectic formation. Copies of this Technical Brief may be obtained for 15 cents each from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

-- Am. Ind. Hyg. Assn. J. 27, 368 (July-Aug. 1966)

COMING EVENTS

- | | | |
|------|----------|---|
| 1033 | Dec. 1 | American Epilepsy Society, New York, N. Y. |
| | Dec. 1 | Synthetic Organic Chemical Manufacturers Association, Annual Meeting,
New York, N. Y. |
| | Dec. 1-3 | American Physical Society, Nashville, Tenn. |
| | Dec. 1-3 | Academy of Psychosomatic Medicine, Las Vegas, Nev. |
| | Dec. 2-3 | American Rheumatism Association, Interim Session, Cincinnati, Ohio. |
| | Dec. 3-6 | American Academy for Cerebral Palsy, New Orleans, La. |
| | Dec. 3-8 | American Academy of Dermatology, Bal Harbour, Florida. |
| | Dec. 4-7 | American Society of Hematology, New Orleans, La. |
| | Dec. 4-8 | American Institute of Chemical Engineers, 59th Annual Meeting, Detroit, Mich. |
| | Dec. 5-8 | Chemical Specialties Manufacturers Association, 53rd Annual Meeting,
Hollywood, Florida. |

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- Dec. 5-8 National Fertilizer Solutions Association, 12th Annual Convention, Miami Beach, Florida.
- Dec. 8 The Proprietary Association, Annual Research and Scientific Development Conference, New York, N. Y.
- Dec. 9-10 Symposium on Contractile Process (Sponsored by the New York Heart Association), New York, N. Y.
- Dec. 12-14 National Conference on Air Pollution, Washington, D. C.
- Dec. 16-18 American Psychoanalytic Association, New York, N. Y.
- Dec. 26-31 American Association for the Advancement of Science, Annual Meeting, Washington, D. C.

LEGAL DEVELOPMENTS

1034 New FDA Regulations on Vitamins.

Drug makers have moved to block new FDA regulations on vitamins. The Pharmaceutical Manufacturers Association (PMA) and twelve of its member firms asked the U.S. District Court for the District of Columbia to rule that new Food and Drug Administration regulations on vitamins were issued illegally. Last June FDA issued regulations, stated to take effect January 9, 1967, which establish definitions and standards of identity for dietary supplements and for vitamin- and mineral-fortified foods and restrict the ingredients that these products can contain. PMA claims that FDA issued the regulations without going through the procedures required by law.

-- Chem. Eng. News 44, 43 (Oct. 3, 1966)

BOOKS, PAMPHLETS AND NOTICES

1035 Transactions of the 15th International Congress on Occupational Health. 524 pp. (Sept. 19-24, 1966). AVAILABLE FROM: Schreiburo E. Werner, Wien VIII, Lederergasse 14. PRICE: Not Given.

Transactions of the 15th International Congress on Occupational Health have been received along with the abstracts. Abstracts appear in German, French and English. Papers in which the Transactions appear in the language in which they were presented, are organized under the following general headings: Organization of Occupational Medicine; Industrial Hygiene; Occupational Diseases and Toxicology; Occupational Physiology; Occupational Psychology; Traumatic Medicine and Rehabilitation; Degenerative Diseases and Rehabilitation; Maximum Allowable Concentration of Toxic Substances in Industry; Occupational Skin Diseases; Specific Aspects of Occupational Metal Poisonings; Absenteeism; Carcinogenic Effects of Industrial Materials; Economics of Industrial Health; Noise; Light; Climate; Occupational Health and the Adolescent Workers; Experimental Neuro and Psychophysiology in Occupational Medicine; Problems of Female Employment; Basic and Advanced Training in Occupational Medicine; Occupational Health Trends in Countries in the Process of Industrialization; Biological Effects of Nitro-Glycol; Asbestosis; Byssinosis; Radiation Effects and Protection Against Radiation; Agricultural Medicine; Activities of the Industrial Nurse; Traffic Medicine; Respiratory Function Tests in Occupational Pulmonary Diseases; Bronchial Asthma Caused by Occupational Factors; Occupational Medicine at Construction sites; Work and Circulation; Insecticides; Foreign Labour; Electropathology; Plant Physicians; Medical Factory Inspectors; Public Health Physicians and Medical Assessors; and Safety Engineers. Several industrial hygiene abstracts will be of special interest to Foundation members and will appear in the next issue of the Digest. Among these are: AII-1 (p. 55) Blanz, F., Finland. The combined standard-scale method, a new method for assessing work ratings; AII-10 (p. 65) Prochazka, Z., CSSR. A telemetric method used in the quantitative determination on the weights of loads, lifted or moved by women; AII-14 (p. 69) Strnad, P., CSSR. Substitution of petroleum asphalt for coal tar and coal tar pitch in insulation materials; AII-19 (p. 76) Grossdorfer, K. F., Austria. Tunnel insulation with polyester resin; AII-25 (p. 83) Kleinstein, I., et al., Rumania. Research on immunity factors in silicosis; AII-38 (p. 98) Ohman, H., Sweden. Airborne oil mist in mines and workshops; and AII-42 (p. 103) Bartalini, E., et al., Italy. Urinary mercury in relation to exposure in workers of two chlorine plants. -- RTP de T

1036 Asbestos Bodies and Pleural Plaques in a Finnish Series of Autopsy Cases. Lauri Meurman. 107 pp. (1966). AVAILABLE FROM: The Central Hospital of Kuopio and the Department of Pathological Anatomy, University of Turku, Finland. PRICE: Not Given.

Meurman undertook the monumental task in 1963-64 of studying a series of 438 consecutive autopsy cases of subjects aged 15 years and older, collected from three separate Finnish hospital districts, the cases falling into three groups. Recognizing that routine autopsy cases from general hospitals are primarily selected and thus do not fulfill the strict criteria of an epidemiological investigation, he has subjected the relationship between the frequency of pleural plaques and asbestos bodies to statistical analysis and presents the results. The frequency of cases with

plaques was about the same in two of the three hospital districts investigated in different parts of Finland, whilst in the third it was lower. Plaques proved to be an equally common finding in a district in southwest Finland with no asbestos deposits and no particular asbestos industries, as in a district in east Finland with an asbestos mine and mill and extensive anthophyllite asbestos deposits near its eastern border. Plaques were encountered in 52.2% of the urban population and in 31.8% of the rural population. Asbestos bodies in the lungs and pleural plaques occurred more often in conjunction than separately. Pleural plaque formation, in particular when bilateral, and the occurrence of asbestos bodies in the lungs appear to have some etiological factor in common. The dust which induces the formation of asbestos bodies does not, however, seem to be the sole cause of plaque formation.

EDITOR'S NOTE: In this regard the author's findings are similar to those reported by Kenneth W. Smith, M.D., in the section on "Asbestosis" in Lanza's "The Pneumoconioses:" "If inhalation of the asbestos fibre alone could cause these plaques, one would expect to find plaques wherever the fibre is used." (See Industrial Hygiene Digest 27:5 p. 4, May 1963.) -- RTP deT

- 1037 Standard for the Use, Maintenance and Operation of Industrial Trucks. NFPA No. 505. National Fire Protection Association. 28 pp. AVAILABLE FROM: National Fire Protection Association, 60 Batterymarch Street, Boston, Mass. 02110. PRICE: 60 cents.

The 1966 edition of this publication containing extensive revisions, has recently been published by the National Fire Protection Association. This new technical standard applies to fork trucks, tractors, platform lift trucks, motorized hand trucks and other specialized industrial trucks powered by electric motors or internal combustion engines, that are designed for use in hazardous locations. Material in NFPA No. 505 pertaining to maintenance and operation of these specialized industrial trucks has undergone complete revision. Guidelines for handling and use of fuel have been reorganized and clarified, as have recommendations on marking and operating of industrial trucks suitable for use in hazardous locations, as well as of signs for designated entrances to hazardous areas of buildings. The current text of the standard was developed by the Committee on Industrial Trucks under the chairmanship of John Mount of the Insurance Company of North America, Philadelphia, Pa. It was adopted at the 1966 NFPA annual meeting.

- 1038 Hazardous Chemicals Data. NFPA No. 49. National Fire Protection Association. 180 pp. AVAILABLE FROM: National Fire Protection Association, 60 Batterymarch Street, Boston, Mass. 02110. PRICE: \$1.50.

Data on 20 chemicals not previously included has been added to "Hazardous Chemicals Data" (NFPA No. 49), the 1966 edition of which has recently been published by the National Fire Protection Association. The publication now lists hazardous properties of nearly 200 chemicals and outlines means of protection against these hazards in normal and abnormal situations. For the first time, the Hazard Rating Number System (NFPA No. 704M) has been applied to all chemicals covered in this standard. Information has been greatly expanded in the sections on full protective clothing, clothing contamination, vapor-air density, the hazard identification system, and self-accelerating decomposition temperature. Revisions have been made in material on breathing equipment for toxic or oxygen-deficient atmospheres, explosives, and vapor density, and in data on several chemicals listed in the previous edition. A valuable reference work for industrial firms using chemicals as well as for the fire services and transporters, the 1966 edition of this work gives for each chemical listed a description, fire and explosion hazards, life hazard, fire fighting advice, usual shipping containers, storage recommendations, and, where appropriate, special remarks and cross-references. The new and revised portions of this standard have been developed by the NFPA Sectional Committee on Properties of Hazardous Chemicals under the chairmanship of Thomas E. Duke, Fire Prevention and Engineering Bureau of Texas, Dallas, Texas. The current edition was adopted at the 1966 NFPA annual meeting.

- 1039 Flammable and Combustible Liquids Code. NFPA No. 30. National Fire Protection Association. 96 pp. AVAILABLE FROM: National Fire Protection Association, 60 Batterymarch Street, Boston, Mass. 02110. PRICE: 75 cents.

Important major revisions growing out of a decade of close study have been incorporated in the 1966 edition of this code recently published by the National Fire Protection Association. A more realistic approach to the use of flammable liquids in the wide variety of occupancies using them has been written into this publication to provide a reasonable degree of safety. For example, the standard now recognizes minimal handling of flammable liquids in such an occupancy as a neighborhood paint store, as contrasted with procedures in plants which utilize chemical reactions of flammable liquids in their manufacturing processes. The newly-revised code includes major revisions on the storage of flammable liquids in containers and incorporates new requirements

for the storage, handling and use of flammable and combustible liquids in industrial and processing plants. Other major revisions include those in the chapter on Service Stations, which—for the first time, and under carefully prescribed conditions—permits various types of self-service dispensing of gasoline. Recommendations pertaining to dispensing devices such as coin-operated, card-operated and remote preset types are intended to establish reasonable safeguards for self-service gasoline stations, which are increasing in number both in the United States and abroad. Adopted at the NFPA's annual meeting in Chicago this spring, the 1966 text of the code was developed by the Sectional Committee on General Storage of Flammable Liquids, headed by Raymond M. Hill, Chief of the Los Angeles Fire Department.

INDUSTRIAL MEDICAL PRACTICE

- 1040 The Industrial Physician's Appraisal of Emotionally Disturbed Employees. L. E. Himier. J. Occ. Med. 8, 418-421 (Aug. 1966).

It is incumbent upon the occupational physician to adapt his examination and interviewing techniques to the expanding requirements of mental health programs in industry. One aspect of this task is the development and refinement of a personality appraisal procedure which is not too cumbersome to be of practical use in a continuing health maintenance program. To fulfill this function the appraisal survey should touch on all the major facets of personality known to be applicable to the work situation, and at the same time permit some degree of standardization and orderly recording. A six-point psychoergonomic approach encompassing Appearance, Ability, Affectivity, Adjustment to Authority, Attitudes, and Adaptability, could contribute meaningfully both to individual health counseling and to computerized research projects in the field of industrial mental health. Six references are listed.

-- Author's summary

- 1041 Standards for the Employment of Former Mental Hospital Patients. C. Leggo. J. Occ. Med. 8, 135-137 (March, 1966).

The author believes that the success of a program for the handicapped can be better measured by the job successes of those handicapped people hired than by their number. Each person with a health problem, be it physical or emotional, who is employed and who compares favorably with his fellow employees in productivity and safety, and in lack absenteeism and turnover, will increase employer acceptance of applicants with similar histories. Conversely, an unfavorable experience will tend to condition the employer to resist employment of those with similar histories. It is for this reason that we are continuing in our search for criteria that will assist in identifying those applicants who will perform successfully if employed.

- 1042 Psychiatric Disability and the Industrial Physician. J. Lerner. J. Occ. Med. 8, 257-260 (May, 1966).

The decision as to psychiatric disability under the Social Security program is based on the existence of a psychiatric illness which has prevented work activity six months or longer, is expected to be of long-continued and indefinite duration despite treatment, and results in persistent and substantial loss of function such that the residual functional capacity is insufficient to permit any type of work activity. Loss of function is established on the basis of evidence of psychological, physiological, social, or personal regression. The psychiatric illness need not be work-related, but the diagnosis must be accompanied by clinical evidence of substantial loss of functional capacity.

-- Author's summary

- 1043 Management in Medicine. R. J. Evans. J. Occ. Med. 8, 413-414 (Aug. 1966).

American medicine has a real obligation to industry and labor to develop an organization capable of implementing a program that will provide workers with the finest health services at a reasonable cost. But such a program demands good management that can yield benefits to the patients, the doctors, and those paying the bill.

-- Author's conclusion

- 1044 The Periodic Examination. Key to the Prevention and Early Detection of Disease. E. Day. J. Occ. Med. 8, 409-412 (Aug. 1966).

The periodic examination, along with certain immunologic procedures and basic health practices, is one of the real opportunities to practice effective preventive medicine as well as early detection. Here early diabetes, potential heart disease, glaucoma, and cancer can be detected while the condition is in a stage where actual eradication or at least control of the disease can be

realized. Although mental illness is often considered too touchy a subject to be handled by industrial or business medical departments, these units are in the front line in aiding employees who may show early signs of extreme fatigue or emotional disturbance. Today, it is estimated that mental illness accounts for at least 50% of absenteeism, at a cost to industry of approximately \$5 billion, and underlies 75% of all accidents, costing \$3 billion a year. With time, the over-all health of individuals examined on a periodic basis will be improved to a level where complications from established disease will be substantially reduced or milder in nature. Perhaps, with time, analysis of the results of the periodic preventive examination will find that resistance to some chronic conditions and diseases will be raised as other diseases are treated early and a high level of basic health is maintained.

- 1045 Cigarette Smoking and Platelet Aggregation. M. F. Glynn, et al.
Can. Med. Assn. J. 95, 549-553 (Sept. 10, 1966).

The influence of cigarette smoking on platelet aggregation was studied in habitual and non-habitual smokers. The results indicate that habitual smokers have a greater tendency to platelet aggregation than do non-habitual smokers. Acute effects of cigarette smoking were, however, not significant. The nucleotide content and the serotonin content of the platelets were analyzed. The adenosine nucleotide and serotonin contents were similar in smokers and non-smokers in the control state and neither showed significant changes on cigarette smoking. There were significant correlations between the control concentrations of the various nucleotides in both groups and there were even higher correlations after smoking. Platelet aggregation bore no demonstrable relationship to the nucleotide or serotonin contents of the platelet. The authors conclude that the long-term effect of smoking is probably more important than the acute effect.

-- Authors' abst.

- 1046 Polyolefins in Cigarette Smoke. D. L. Dare, I. D. Entwistle, and R. A. W. Johnstone.
Chem. Ind. (London) No. 15, 629-630 (April 9, 1966).

The neutral fraction of cigarette smoke condensate was extracted with thiourea and the extract separated by chromatography on silica gel to yield a number of isoprenoid polyolefins. The existence of these polyolefins in quite large quantities (two to five micrograms per cigarette) and their absence in cured or fresh, green tobacco leaf suggests a pyrolytic mechanism for their formation. Six references are given.

-- Public Health Eng. Absts.

- 1047 Smoking as an Independent Variable in a Multiple Regression Analysis Upon Birth Weight and Gestation. J. R. Abernathy, et al. Am. J. Public Health 56, 626-633 (April, 1966).

Regression analysis was employed in analyzing variation in birth weight and length of gestation in a group of Baltimore Negro women of like socioeconomic class. Several variables were included in the regression function, but major emphasis was on smoking history and psychosomatic complaint score. The total effect of smoking as determined from the predictive equation computed from the data under the present model showed a 129 gram differential in birth weight of offspring of smokers and nonsmokers. Among smokers, the total gestational effect indicated that as gestation increased birth weight increased, but at a decreasing rate. Ten references are given.

-- Public Health Eng. Absts.

- 1048 Resurvey of Industrial Hygiene Services in Industry. American Industrial Hygiene Association. Ad Hoc Committee on Resurvey of Industrial Hygiene Services.
Am. Ind. Hyg. Assn. J. 27, 369-378 (July-Aug. 1966).

The resurvey of industrial hygiene services in industry was undertaken at the recommendation of the Executive Committee, American Industrial Hygiene Association, to determine what changes, if any, have taken place in the organization and activities of industrial hygiene units in industry since the 1956 survey. An Ad Hoc Committee, appointed for this purpose, conducted a mail questionnaire survey in 1965. The resurvey disclosed a higher proportion of industrial hygienists associated with a plant safety organization than was found in the 1956 survey. Conversely, it also disclosed a relatively extensive degree of reliance on safety and other plant personnel for performing functions that traditionally fall to industrial hygienists. This may be accounted for by shortage of industrial hygienists, the relatively high degree of control of hazardous situations in large industry, and the realization that certain routine functions can be performed adequately by personnel trained for special activities, thus freeing the industrial hygienist for other responsibilities. An increased interest by industries in consolidating industrial hygiene with safety may

also be reflected. On the other hand, comments indicated that some companies still need to be sold on the need for routine supervision of potentially hazardous situations and that their solution requires the competency of trained industrial hygienists. It is believed that owing to limitations inherent in a mail questionnaire survey, the full implication of changing industrial technology and economy and its effect on the profession of industrial hygiene was not adequately brought out in the resurvey.

- 1049 The Bronchospastic Component in Patients With Chronic Bronchitis and Emphysema. J.K. Curtis, et al. J. Am. Med. Assn. 197, 693-696 (Aug. 29, 1966).

The bronchospastic component in 100 patients with moderate to severe chronic bronchitis and emphysema was investigated by determination of serial, timed vital capacity (FEV₁) before and after isoproterenol hydrochloride inhalation. Four hundred and twenty-five studies over a one-to five-year period showed that the FEV₁ decreases with progression of disease; however, the degree of bronchospasm did not change significantly, indicating a tendency for bronchospasm to persist in many patients in spite of the use of bronchodilators (95 patients), daily intermittent positive pressure breathing (51 patients), and steroids (21 patients). A paradoxical response to isoproterenol was encountered in nine patients. Eighty-four patients showed definite improvement in FEV₁ in one or more tests after isoproterenol administration. It is concluded that a bronchospastic component exists in most patients with chronic bronchitis and emphysema, whether or not a history of asthma is elicited.

-- Authors' abst.

- 1050 Acute Ventilatory Failure in Chronic Obstructive Lung Diseases. F.B. Saksena and B. Burrows. Diseases of Chest 50, 176-178 (Aug. 1966).

Chronically hypercapneic patients with chronic obstructive lung disease are likely to develop acute increase in carbon dioxide retention under the stress of acute respiratory infection or with exacerbation of congestive heart failure. With milder episodes of acute ventilatory failure, patients usually respond satisfactorily to management of the underlying cardiopulmonary disorder, requiring neither analeptic drugs nor mechanical ventilatory assistance if infection is removed.

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

- 1051 The Responsibilities of a Medical Director to Management. R.L. Wells. J. Occ. Med. 8, 415-417 (Aug. 1966).

Certain premises are outlined relating the medical director and his staff to management. Certain opportunities of an occupational health program are defined and its expectations of management are listed. Correlating with these are areas of responsibility of the medical director to management, responsibilities that he must assume if he is to be an effective employee and produce results beneficial to the successful management of the business. Encroachment upon management responsibilities and employee "rights" are the order of the day. Within his own sphere of management responsibility and obligation to the individual employee, the medical director must maintain a position of alertness to change and a flexibility to adjust to it. At the same time, he must never forget that his greatest responsibility is to the individual employee-patient, whether the latter is in management or nonmanagement. The medical director's position is a challenging one and, having accepted the challenge voluntarily and by choice, he must continually accept his responsibilities in an objective and ethical manner.

-- Author's summary

- 1052 The Physician Executive. D.H. Stoddard. J. Occ. Med. 8, 132-134 (March, 1966).

The physician manager learns that the toxic agent most responsible for decreased productivity and perhaps ill health in the organization is not physical or chemical. Much more is it the poison of unsatisfactory interpersonal relationships. Misunderstanding, avarice, ambition, vanity, selfishness, and reckless rationalizations constitute some of the basis for the ineffective interaction of individuals in organizations and are potent agents for decreasing productivity. It must be remembered that a medical department is not immune to these nonchemical and nonphysical toxic agents. The major emphasis in this paper has not been placed on toxicology, or emergency care, or finger-wrapping activity; predominantly it is the integration activity concerned with the social sciences, the sciences of engineering and clinical medicine. In order to accomplish this integration and application, the physician must utilize modern, technical management skills just as he uses technical skills in clinical medicine. As often as possible, he must be able to express to management, in terms of factual data, just what the significance of this specialty of medicine can mean to the organization's mission. This physician executive who is managing the program must understand this role as a member of the profession. Furthermore, he must divorce himself sufficiently from his parochial medical role in order to implement a program and to utilize management techniques in the organizational framework. Only then will there come into being a program that is not only accepted by management but is quite definitely a part of it. The role of the physician executive is one of the most difficult and challenging medical roles today.

- 1053 Study of Public Health Careers: Some Characteristics of Industrial Physicians. W. P. Shepard, R. H. Elling, and W. F. Grimes. *J. Occ. Med.* 8, 108-119 (March, 1966).

On the basis of a 67.5% satisfactory response to questionnaires sent to 342 members of the American Academy of Occupational Medicine (and subject to the limitations involved in the analysis of mailed questionnaires), the authors venture the following conclusions regarding this select group of industrial physicians: Hardly any had obtained academic public health degrees in addition to the M. D. However, the number certified as specialists in occupational medicine by the American Board of Preventive Medicine indicates that many have had special training. Most were employed by industry, but a goodly number were employed by colleges or universities. As a whole, they were a mature group, average ages being distinctly higher than in a general sample of over 6,500 professional people whose careers were devoted to public health work of some kind. Those affiliated with the American Public Health Association (APHA) were more involved in voluntary community health associations than either those in the general sample of public health professionals or other industrial physicians not affiliated with the APHA. More came from the "higher" social classes than those in the general sample. Few in any of the samples came from the "lowest" class. There were few Negroes in any of the samples. Less than 3% of industrial physicians' sample were women. As compared with those in the general sample, industrial physicians (1) showed some differences in religious preferences; (2) showed a marked difference in political preferences, nearly twice as many favoring the Republican party; (3) were better paid and had had greater increases in the past four years; (4) were relatively stable, more of them staying in the same field for longer periods; (5) felt their work was about as well understood by their supervisors as was the case among the general sample. - Cond. from authors' conclusions

- 1054 Salmonella Isolations From Stuffed Natural Poultry Toys. J. Price. *Public Health Repts.* 81, 387-388 (April, 1966).

Eighteen imported toys, six eviscerated and stuffed 2-or 3-day old chicks and ducklings and 12 artificial chicks made from chenille, were examined for enteric pathogens. Five natural toys and one artificial chick were found to be contaminated with Salmonellagive. The artificial toy may have been contaminated from contact with the natural toys. There are 14 references.

-- Public Health Eng. Absts.

- 1055 Physiological Fatigue and Energy Expenditure of Production Machine Operators. C. Zenz and B. A. Berg. *Am. Ind. Hyg. Assn. J.* 27, 321-322 (July-Aug. 1966).

Typical small drill press and milling machine operations were studied with standard ergonomic techniques. Continuous recordings of heart rate, respiratory minute volume, and oxygen consumption were made, with healthy workers as subjects. No technical drawbacks were noted, and these studies will be extended to include other machine operations. -- Authors' abstr.

- 1056 Evidence for the Local Action of Intranasal Dexamethasone Aerosols in the Suppression of Hay Fever Symptoms. P. S. Norman, et al. *J. Allergy* 38, 92-98 (Aug. 1966).

Nasally administered dexamethasone aerosols have been shown to suppress hay fever symptoms in about 75% of patients with ragweed hay fever. To determine whether symptomatic improvement is due to the local action of the steroid in the nose, or is due to systemic absorption, seasonal symptoms were compared in ragweed patients who received either the nasal aerosol or an oral dose of steroid with equivalent metabolic effect. Control of symptoms in patients receiving the metabolic equivalent of dexamethasone orally was better than in patients receiving placebo.

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

- 1057 Glaucoma: Experience With Tonometry in 909 Consecutive Employee Patients. N. C. Kiefer and W. S. Braverman. *J. Occ. Med.* 8, 95-100 (March, 1966).

Glaucoma is a common disease in both males and females aged 40 and over, and perhaps at even younger ages. It is a serious nationwide health problem and is the second most common cause of blindness. It is readily amenable to detection by a screening procedure, tonometry, which can be quickly learned by a physician; it is an unusually simple and inexpensive test to carry out with accuracy; and it is attended by essentially no undesirable reactions, even of minor degree. With early detection, simple medical therapy is frequently effective but must be continued for life. The results of such examinations in 909 consecutive periodic health examinations of as many employees aged 40 and over are reported. Abnormal intraocular pressure was found in 3.7% and a diagnosis of actual glaucoma subsequently was made in 2.8% of the total group. The prevalence of abnormal findings was essentially the same for employees in their forties, fifties, and sixties, until retirement. The cost of tonometry is extremely low but the value to both employee and employer is unusually great.

-- Authors' summary

- 1058 Glaucoma Screening in an Industrial Complex. K. L. Stratton, et al.
J. Occ. Med. 8, 427-432 (Aug. 1966).

Two diseases are responsible for 50% of all cases of blindness in the United States: cataract (34%), and glaucoma (16%). Presently, about 50,000 people in the United States are totally blind from simple chronic glaucoma; 150,000 are blind in one eye. Various sources estimate that from 800,000 to one million have the disease but are not aware of it. The prevalence rate has been cited as 2% of those over 40 years of age. It is only infrequently that glaucoma occurs under the age of 40, and if everyone over that age were examined no less often than every two years, many cases of blindness could be prevented. Of primary glaucoma, the more dramatic is the acute-congestive type, which is also referred to as closed-angle glaucoma because the filtration angle (junction of iris and cornea) is obstructed. The symptoms are acute—severe pain, marked blurring of vision, congestion, dilated pupil, and shallow, steamy cornea—all clearly described in texts. The more subtle and the more prevalent form is simple (chronic, noncongestive) glaucoma, frequently referred to as open-angle, since the filtration angle is unobstructed. This form lends itself to screening techniques and represents about 90% of all cases. In the present paper some of the problems surrounding glaucoma detection are reviewed and three methods of applying screening tonometry in an industrial complex presented. The number of cases discovered in three companies varied from less than 1% to 2%, less than the expected rate because some of those examined had been previously diagnosed, and no one over 65 was examined. The results demonstrate that the yield from this type of procedure equals the expectation of other comparable screening techniques for specific diseases.

- 1059 Palmar Dermatoglyphics in Heart Disease. Differential Studies in Japanese and American Populations With Congenital and Acquired Heart Diseases. T. Takashina and S. Yorifuji.
J. Am. Med. Assn. 197, 689-692 (Aug. 29, 1966).

Palmar dermatoglyphic patterns on 44 patients with congenital heart disease were compared with patterns on 362 patients with acquired heart disease. Distal displacement ("t" or multiple axial triradii) of the palmar axial triradii occurred with significantly greater frequency in the patients with congenital heart disease (64%), than in the patients with acquired heart disease (17%). Studies of the probability of the occurrence of these differences in palmar dermatoglyphics on a chance basis alone gave a value of less than 0.0000000001 for Japanese. This compares with a probability value of 0.0000634 for whites, and 0.0164 for Negroes. Dermatoglyphics is emerging as a clinical instrument and genetic tool of significance.

-- Authors' abst.

- 1060 Natural History of Tuberculosis in the Human Body. J. A. Myers, J. E. Bearman, and A. C. Botkins. Diseases of Chest 50, 120-132 (Aug. 1966).

In 2,908 medical students studied over a 23-year period, the tuberculin test served to identify those students who harbored tubercle bacilli. Among 904 survivors who reacted to tuberculin on entrance to school, 31 (3.43%) developed clinical pulmonary or extrathoracic tuberculous lesions, three had only pleurisy with effusion, and one died from tuberculosis.

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

- 1061 Malaria Contracted in Pennsylvania. J. D. Shaw and W. D. Schrack, Jr.
Public Health Repts. 81, 413-418 (May, 1966).

Adult mosquitoes of the species Anopheles quadrimaculatus are found in all ten climatic divisions of the state; peak populations of the species have been observed in July and August. In July and August, the average daily temperature in Pennsylvania will permit completion of the extrinsic incubation period of Plasmodium malariae within 25 to 30 days and of Plasmodium vivax within 14 days. The presence of the mosquito, its proximity to man, and its feeding habits make it possible under these climatic conditions for the mosquito to transmit malaria from a reservoir to a susceptible population. There are 14 references.

-- Public Health Eng. Absts.

- 1062 Diabetes Screening by a City Health Department. Mary T. Williams.
J. Occ. Med. 8, 422-424 (Aug. 1966).

This paper describes the diabetes screening process as done by the San Jose Health Department in San Jose, California. Diabetes is now the eighth leading cause of death in the United States and the third cause of blindness, as well as a major cause of disability from associated cardiovascular lesions, renal breakdown, and amputation. Among the 3-4 million diabetics in the United States today, an estimated 1.4 million are unaware of their condition. The number of diabetics is expected to increase markedly with increasing numbers of older people, better

treatment, and more diabetics living into their reproductive years. Fifty per cent of cases develop after 45 years of age, and life expectancy for a 45-year old diabetic is 20.2 years, as compared with 28.9 years for a nondiabetic. The screening procedure consists in giving each individual 50 g. of dextrose in 6 oz. of lemon-flavored water, made up in the laboratory; such drinks are commercially available. The time of the drink is noted and exactly one hour later a blood sample is taken. During this waiting period, two films—"Diabetics Unknown" and "Hold Back the Night" (about glaucoma)—are shown and there is time for questions. There is no charge for the tests. The blood is tested on the Clinitron or the Auto Analyzer details of which are given in the paper.

- 1063 An Epic of the Coal Fields. J.D. Winebrenner. J. Occ. Med. 8, 403-408 (Aug. 1966).

Although an imposing amount of material has been published on the medical program of the United Mine Workers of America (UMWA) Welfare and Retirement Fund, a generation has turned since the Fund was born, and the subtle passage of time may have obscured, even to those who knew it well, some of the drama and challenge the program represents. In the historical sense, the medical program of the Fund is an experiment in the payment for and distribution of medical care. The Fund was designed within the realm of private enterprise to provide a special solution to a special problem of one segment of our population. Events of the future will telescope ever more swiftly as social medicine arrives at the portals of change. The UMWA Welfare and Retirement Fund will continue to augment the medical services to the coal miner, wherever he lives and to whatever extent the fortunes of labor and industry allow.

- 1064 The Industrial Revolution in England. C.P. McCord. J. Occ. Med. 8, 101-107 (March, 1966).

Many industrial nations have gone through evolutionary periods, termed "industrial revolutions" in which cottage-type manufacturing pursuits were replaced by a factory system. England provided a striking archetype for all such revolutions. It is a pedestrian belief that the United States never underwent any industrial revolution. Valid exposition contends that this country moved directly from pioneer production for household and local purposes into a factory system. This country fell heir to a ready-made factory system growing out of England's experience. All that was achieved in England, ready-made and in full panoply, fell to this country at just the time when this country was ready for factory enterprise on an expanding scale. Much of that contention will withstand critical probing. While the United States may have harbored no industrial revolution in the conventional sense, its industries have undergone upheavals that are revolutionary. When in 1891 Acheson first produced Carborundum, the first synthetic abrasive, he inaugurated a striking industrial revolution. Without synthetic abrasives our now current, dominant, fulminant, and explosive industrial culture never would have arrived. At the present time this country is in an industrial revolution. Before long there will be a spate of allusions to the "automation revolution." Of all the forces that forged the industrial revolution in England, the ones most closely associated with occupational health were the monumental mechanical inventions, chiefly in the textile trades. But one cannot overlook the arrival of the steam engine and the railroad or the adaptation of bituminous coal to industrial pursuits. With the exception of Eli Whitney's cotton gin, all these creations were of English origin. These developments and others created England's industrial world, and, in time, the industrial world at large. -- Cond. from author's summary

- 1065 Clinical Studies of Farmer's Lung. D.A. Emanuel and F.J. Wenzel. N.Y. State J. Med. 65, 3027-3032 (Dec. 15, 1965).

The authors discuss some of the cases of farmer's lung and similar afflictions, which were seen at the Marshfield Clinic at Marshfield, Wis., and present in some detail three case histories. They state that the most important aspect in treatment of these illnesses is the removal of the patient from further contact with offending material. In an acutely ill patient this is accomplished by his own symptoms. Often the relief from symptoms, which can come to patients who do not have too severe a pulmonary involvement, and when medication with adrenal cortical steroids has been successful, gives the patient a false sense of security that the symptoms will not return and he is reluctant to leave the area of the offending substance. -- APCA Absts.

- 1066 Comment and Summary of Symposium on Farmer's Lung. K.W. Wright. N.Y. State J. Med. 65, 3036-3037 (Dec. 15, 1965).

The author summarizes the symposium on farmer's lung and related diseases which was held at the new State University Hospital, Syracuse, N.Y., on Feb. 9, 1965. He discusses briefly some of the difficulties of making a specific diagnosis and of serological testing, the possible etiological function of T. polyspora, the lack of any studies involving a provocative challenge

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with the suspected antigenic substance, and the difficulties involved in making the diagnosis because of the several closely related disease syndromes. He concludes with the statement that the problem of pulmonary granuloma is far from being resolved. An addendum to the symposium notes the recent papers by Reed, et al., of a newly observed interstitial pulmonary disease which they have called pigeon-breeder's or fancier's lung. There are 25 references. -- APCA Abstracts

SKIN DISEASES AND BURNS

- 1067 Use of Ice Water in the Treatment of Burns. E. B. Cunningham and J. L. Harris. J. Occ. Med. 8, 271-272 (May, 1966).

The use of immersion in ice water or, when not practicable, the application of ice water compresses, has been most successful as an emergency treatment for burns of thermal, chemical, or electrical origin. In virtually every instance, it has provided instant and complete relief of pain and the authors have been uniformly delighted by the absence of edema, tenderness, and blistering that could be expected from such burns. The authors recommend, therefore, that it be adopted as first-aid treatment for burns involving limited portions of the body's surface.

-- Authors' summary modified

- 1068 Carrier Specificity of Tuberculin-Type Reaction to Trivalent Chromium. H. A. Cohen. Arch. Dermatol. 93, 34 (Jan. 1966).

It is deduced from experimental studies that individuals can have a dermal-epidermal sensitivity to certain substances, one of which is chromium. Patients sensitive epidermally to hexavalent chromium also show a dermal sensitivity to trivalent chromium. This was discovered by binding trivalent chromium to different fractions of serum protein. The study involved 44 patients with contact dermatitis due to hexavalent chromium. The patients were injected intradermally with chromium chloride; human serum albumin containing 11% gamma globulin; human gamma globulin containing 8% albumin; and chromium chloride complexes of the above serums. The 44 chromium-sensitive patients all reacted to the chromium chloride and to the human serum albumin-chromium chloride complex. This led to the conclusion that the human serum albumin is an active carrier when trivalent chromium is injected or absorbed through the skin after reduction from bichromate. Twenty of the 44 were tested intradermally with gamma globulin-chromium chloride complex and the gamma globulin control. Eight of the 20 reacted to the complex and one to the control. The reactions to the gamma globulin might have been due to the small amount of albumin (8%) contained in the globulin, or as the author suggests, the 12 of the 20 who did not react displayed carrier specificity by reacting to the chromium chloride-human serum albumin complex but not the chromium chloride-globulin complex.

-- J. Occ. Med. Absts.

- 1069 Dermatitis in a Crisp Factory. P. M. Inman. Acta Dermato-Venerol. 45, 295 (1965).

Three cases of contact dermatitis occurred among workers in a potato crisp (chip) factory. The dermatitis involved the exposed parts of the upper extremities. Five volunteers were patch tested to the following flavoring additives: (1) cheese powder, (2) onion powder, (3) an inert wheat filler ("Yestamin"), and (4) a meat flavor powder ("Yestameat"). None of the volunteers reacted. The affected patients, however, did react to patch tests with cheese powder, wheat filler, and onion powder. It was felt that the clinical cases represented allergic contact dermatitis.

-- J. Occ. Med. Absts.

- 1070 Solar Urticaria as the Presenting Manifestation of Systemic Lupus Erythematosus. P. Delorme and J. M. Giroux. Can. Med. Assn. J. 95, 539-542 (Sept. 3, 1966).

Systemic lupus erythematosus in a 43-year old white woman is described. The major manifestation of the disease was solar urticaria. On review of the clinical history and the laboratory tests, this woman had mild intermittent polyarthralgia of 20 years' duration, long-standing asthenia, a ten-year history of normochromic anemia with leukopenia, and positive LE clot and latex tests on two separate occasions. Full-scale investigation failed to reveal any other major abnormality. Photo testing with ultraviolet light reproduced the urticarial lesion. Solar urticaria in systemic lupus erythematosus is rare and the benign course of certain cases of systemic lupus erythematosus is emphasized. There are 15 references.

-- Authors' summary

CHEMICAL HAZARDS

- 1071 Carcinogenicity of Epoxides, Lactones, and Peroxy Compounds. Part II. B. L. Van Duuren, L. Orris, and N. Nelson. *J. Natl. Cancer Inst.* 35, 707 (Oct. 1965).

In a series of 26 compounds (including 15 epoxides, 5 lactones, 4 hydroperoxides, 1 epoxylactone, and 1 peroxide) tested for carcinogenicity by life-time application to mouse skin, eight gave both benign and malignant tumors. These were d, l-diepoxybutane, mesodiepoxybutane, 1, 2, 4, 5-diepoxypentane, 1, 2, 6, 7-diepoxyheptane, glycidaldehyde, beta-butyrolactone, 1-hydroperoxy-cyclohex-3-ene, and ascaridole. These carcinogenic compounds had a much lower order of activity than aromatic hydrocarbon carcinogens. Four of the carcinogenic epoxides and lactones were tested for initiating activity with croton resin as a promoter and were found to be weak initiators. Carcinogenicity and mutagenicity relationships for this series of compounds are discussed.

-- J. Occ. Med. Absts.

- 1072 Toxicity Studies on 1, 1, 2, 2-Tetrachloro-1, 2-Difluoroethane and 1, 1, 1, 2-Tetrachloro-2, 2-Difluoroethane. J. W. Clayton, Jr., et al. *Am. Ind. Hyg. Assn. J.* 27, 332-340 (July-Aug. 1966).

The symmetric and asymmetric isomers of tetrachlorodifluoroethane produced similar effects and low order of acute toxicity in oral, inhalation, or skin tests. The symmetric isomer was mildly irritating to rabbit eyes and guinea pig skin. It was not a sensitizer for guinea pig skin. Repeated four-hour exposures of rats to 3,000 ppm for ten days disclosed slight effects on weight and nervous functions, but no significant pathologic change. Thirty six-hour exposures (rats, mice, guinea pigs, and rabbits) to 1,000 ppm produced no toxic signs. Rat hematology revealed slight leucopenia. Slight liver changes were observed histologically in rats. Atmospheric levels of either isomer should not exceed 500 ppm for hygienic purposes. There are 24 references.

-- Authors' abst.

- 1073 Poisoning by a Malathion-Xylene Mixture. S. Gitelson, et al. *J. Am. Med. Assn.* 197, 819-821 (Sept. 5, 1966).

In a case of severe, nonfatal, malathion-xylene poisoning, a misleading note stating that the patient had drunk a chlordane-kerosene mixture (Flit) led to a delay in specific treatment. The differential diagnosis between poisoning by organophosphates and chlorinated hydrocarbons is discussed, with special emphasis on the significance of contracted pupils in the diagnosis of the former. Early treatment with large doses of pralidoxime in organophosphate poisoning is important and treatment should be continued until it is certain that improvement is lasting. There are 14 references.

-- Authors' summary

- 1074 Absorption and Excretion of Mercury in Miners. A. C. Ladd, et al. *J. Occ. Med.* 8, 127-131 (March, 1966).

Seventy-four male workers in the Idrija mercury operations were examined and the blood and urinary mercury levels determined. The ranges and averages of those with and those without clinical evidence of mercury poisoning did not demonstrate any remarkable difference. Three symptomatic subjects with a prior history of mercury poisoning had low levels of mercury. One case of optic neuritis was seen. It is impossible to determine if this was due to inorganic and metallic mercury. Seventeen workers in a mercury mine in the Philippines with mild symptoms of poisoning and air exposure similar to that at Idrija showed blood and urine mercury content analogous to that found in the Idrija workers. Two years later a second study was done at the Philippines mine encompassing 30 workers. A comparison of workers at the smelter area achieved higher blood and urine mercury levels than found in the earlier study, reflecting the higher mercury vapor concentration in air, but this does not appear to be related to production of symptoms of poisoning. No increase in symptoms of mercurialism was found. There are 17 references.

-- Authors' summary

- 1075 Chronic Inhalation Toxicity of Chlorobromomethane. J. D. MacEwen, et al. *J. Occ. Med.* 8, 251-256 (May, 1966).

Chlorobromomethane is used extensively by the U.S. Air Force as a liquid fire-extinguishing agent both in hand extinguishers and as a secondary agent on aircraft fire trucks. In view of the exposure of Air Force fire-fighters to the vapors of this compound during bulk handling and in the extinguishing of fires, full information on the toxic effects of chronic inhalation is needed. Accordingly, albino rats and beagle dogs were exposed to the inhalation of chlorobromomethane vapors during 124 six-hour exposure, five days per week over a six-month period. The exposure levels of 500 and 1,000 ppm chlorobromomethane produced only one demonstrable effect, the

slight depression of growth in the albino rat. This finding, while statistically significant, was not associated with microscopic pathologic changes in tissues. The chlorobromomethane-exposed animals were normal in appearance, and not visibly different from the control animals. The blood bromide levels in both species were above 95 mg. % in the exposed animals. According to Goodman and Gilman and Brooks and Jacobs, similar bromide levels in man would produce mild sedation. It is, therefore, possible that the exposed animals were under continuous mild sedation which could conceivably modify their eating habits and metabolic activity. From the data presented, the most significant factor in chlorobromomethane intoxication is the serum bromide ion concentration resulting from the metabolism of the chlorobromomethane. In the work reported by Torkelson, animals exposed to 370 ppm chlorobromomethane showed serum bromide levels below 50 mg. %, which appears to be within the safe range. It may be concluded from the present experiments and other experiments cited that the current American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value of 200 ppm for chlorobromomethane is a satisfactory working level for chronic daily exposure. There are 24 references.

- 1076 Methylene Chloride Vapor in Expired Air of Human Subjects. E. C. Riley, D. W. Fassett, and W. L. Sutton. *Am. Ind. Hyg. Assn. J.* 27, 341-348 (July-Aug. 1966).

Methylene chloride is a widely used volatile halogenated hydrocarbon solvent. The primary effect from inhalation of excessive vapor concentrations is narcosis or anesthesia. The threshold limit value of 500 ppm has been established on the basis of repeated vapor exposure in experimental animals and confirmed by experience with human exposures in industry. Although much is known about the toxicity and hazards of methylene chloride, answers to some of the basic questions which are important for competent industrial hygiene control of its industrial use have not been available. Accordingly in the present paper the results of experimental studies of methylene chloride vapor in expired air of human subjects exposed to low, well-controlled concentrations of solvent vapor are presented. Analysis of the expired air data reveals that methylene chloride is excreted principally in the expired air. The rates of "buildup" and "die-away" of the vapor in the expired air are suggested as indicators of the distribution of the solvent in body tissues. There are eight references.

- 1077 Hexachlorobenzene-Induced Porphyria: Effects of Chelation on the Disease, Porphyrin and Metal Metabolism. H. A. Peters, et al. *Am. J. Med. Sci.* 251, 314-322 (March, 1966).

An outbreak of chronic porphyria occurred in southeastern Turkey from ingesting seed grain treated with the fungicide hexachlorobenzene; 3,000 cases with a mortality rate of 10% were involved. Children born to mothers who had eaten the grain developed skin lesions that proved fatal in 95% of cases. Analysis of the maternal milk showed the presence of hexachlorobenzene. There are 44 references.

-- Public Health Eng. Absts.

- 1078 Vikane Inhalation. E. P. Taxay. *J. Occ. Med.* 8, 425-426 (Aug. 1966).

Vikane, the trade name for sulfuryl fluoride, is a relatively new fumigant, available since 1959, for which, human toxicity studies are not available. This paper summarizes some unexpected findings in a case of accidental exposure to Vikane. The fumigant mixture consisted of 1% chloropicrin and Vikane. The latter was used in a concentration of 8 oz. /1,000 cu. ft. of air. At the time of exposure the measurement of concentration of Vikane was not obtained; however, several hours later it was determined to be 5 ppm. Available toxicologic data for animals are reviewed.

- 1079 The Renal Tubule in Experimental Lead Intoxication. C. N. Sun, et al. *Arch. Pathol.* 82, 156-163 (Aug. 1966).

The onset of a defect in renal tubular absorption that occurs in lead intoxication with changes in the ultrastructure of tubular lining cells is reported. After rats were fed a diet containing 1% lead acetate, the urinary amino acids were determined and tubular lining cells were studied. Increased amino acid excretion occurred three weeks after the start of the experiment and coincided with the swelling of mitochondria and the disruption of cristae in cells lining the proximal convoluted tubule. Intranuclear inclusions did not occur until after 8 weeks of the lead-containing diet. The aminoaciduria was generalized, resembling that which occurs in children with lead intoxication. Plasma levels of amino acids were normal or less than normal except for an increase in alanine. Increased plasma alanine suggests a specific block in the metabolism of this amino acid in rats with lead poisoning. Otherwise, the aminoaciduria was secondary to failure of renal tubular reabsorption and was related to degeneration of mitochondria in cells of the proximal convoluted tubule.

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

- 1080 Formation of Oxides of Nitrogen in Pulverized Coal Combustion. D. Bienstock, et al.
J. Air Poll. Control Assn. 16, 442-445 (Aug. 1966).

Nitrogen oxides are a potential atmospheric pollutant. Their formation and decomposition were studied in an experimental pulverized-coal-fired furnace. The concentration of nitrogen oxides (NO_x) was a maximum in the combustion zone and decreased as the combustion gas cooled. At a coal burning rate of 2 lb./hr. and 22% excess air, reduction of nitrogen oxides was obtained by selective secondary-air distribution. With 105% of the stoichiometric air fed to the coal-combustion zone and 17% additional air fed just beyond the flame front, 62% reduction of NO_x occurred with good combustion efficiency. Lowering the quantity of excess air lowered the NO_x concentration, but at the expense of combustion efficiency. When 22% excess air was fed to the primary combustion zone, NO_x concentration in the effluent was 550 ppm and carbon in the fly ash 2.0%. With 5% excess air, the NO_x concentration fell to 210 ppm and carbon in the fly ash rose to 13.8%. With stoichiometric combustion the NO_x was 105 ppm a reduction of 81%, and the carbon was 42.3%. Recirculation of combustion gas was not an effective means of lowering NO_x formation.

-- Authors' abst.

- 1081 Metabolism of Benzene in Nonfasted, Fasted, and Aryl-Hydroxylase Inhibited Rats.
H.H. Cornish and R.C. Ryan. Toxicol. & Appl. Pharmacol. 7, 767 (Nov. 1965).

Following administration of benzene to nonfasted rats, the major metabolites are conjugated phenols other than glucuronides, while in the fasted rat the major excretory pathway is glucuronide conjugation. In rats treated with beta-diethylaminoethyl-di-phenylpropylacetate hydrochloride, all excretory pathways requiring hydroxylation are depressed. Although metabolic patterns were altered, the acute toxicities (oral LD50) were not markedly affected in the studies described. The nutritional state of the animal as well as prior administration of biologically active compounds may alter the fate of ingested compounds and should be considered in metabolic studies or toxicity testing procedures.

-- J. Occ. Med. Absts.

- 1082 The Irritant Potency of m-Terphenyl of Different Particle Sizes. Mary O. Arndur and D.A. Creasia. Am. Ind. Hyg. Assn. J. 27, 349-352 (July-Aug. 1966).

The effect of homogeneous aerosols of m-terphenyl of 0.30, 0.65, 1.0, and 2.0 microns diameter on pulmonary-flow resistance of unanesthetized guinea pigs was studied. At equal mass concentration the irritant potency increased as the particle size decreased and the number of particles increased. A small increase in mass concentration for the smaller particles produced a greater increment in response than occurred when large particles were used. The results were in agreement with earlier work on aerosols of zinc ammonium sulfate.

-- Authors' abst.

INDUSTRIAL DUSTS

- 1083 Hyaline and Calcified Pleural Plaques As an Index of Exposure to Asbestos. (A Study of Radiological and Pathological Features of 100 Cases With a Consideration of Epidemiology).
D. O'B. Hourihane, et al. Brit. Med. J. 1, 1069-1074 (April 30, 1966).

A close association between exposure to asbestos and the development of pleural plaques has been shown. A cause-and-effect relationship is probable. The most extensive lesions are radiologically detectable, and the disease asbestosis is then also present, despite the absence of any other radiological abnormality. The sources of asbestos are considered and evidence is presented to suggest that there is a widespread non-industrial community exposure. Mesotheliomata are common in patients with pleural plaques, and it is suggested that there is a dose-response relationship between the asbestos and the development of these neoplasms. The question of the relationship between lung cancer and asbestos is left open, but the value of radiological surveys for pleural plaques is emphasized in any study of this problem. Asbestos is not the sole cause of pleural plaques, but it is certainly the most common.

-- APCA Absts.

EDITOR'S NOTE: Regarding pleural plaques and asbestos exposure also see abstract No. 1036 this issue.

- 1084 Health Hazards of Asbestos. Anonymous. Lancet 1, 530-531 (March 5, 1966).

The effects of exposure to asbestos and preventive measures taken by industry to eliminate all heavy or unnecessary exposure are outlined. There are 35 references.

-- Public Health Eng. Absts.

03122312

- 1085 Calibration of Glass Fiber Filters for Particle Size Studies. B. Shleien, J. A. Cochran, and A. G. Friend. *Am. Ind. Hyg. Assn. J.* 27, 353-359 (July-Aug. 1966).

The filters calibrated in this study are suitable for field studies of the particle size and respiratory deposition of airborne particles. Variations which might be encountered in field sampling, such as variability of the media itself, changes in face velocity, and filter loading, have a negligible effect on filter characteristics or are easily controllable for moderate sampling durations. The collection efficiencies of individual filters were essentially the same when the filters were tested singly or nested. Calculated collection efficiencies based on current filter theory did not in many cases agree with the experimental results obtained. Sharp cutoffs in collection efficiency were not obtained, so that the particle sizes of airborne material trapped on each filter would not have distinct limits, but represent a continuum. Nevertheless, the glass fiber filter media calibrated with homogeneous aerosols 0.1 to 2.68 microns in aerodynamic equivalent diameter show distinct and separate collection efficiencies, indicating that they are suitable for classification of airborne particles into size groups. There are 12 references. -- Authors' conclusions

- 1086 High Temperature Cloth Collectors. R. L. Adams. *Chem. Eng. Progr.* 62, 66-68 (April, 1966).

Design requirements and operating data are given for high temperature baghouses for the control of emissions from wet and dry process cement kilns, lime kilns, and vertical hearth calciners. Recommended air to cloth ratios, types of construction, and estimated costs for various installations are also covered. -- Public Health Eng. Abstrs.

- 1087 BOP Air Cleaning Experiences. C. M. Parker. *J. Air Poll. Control Assn.* 16, 446-448 (Aug. 1966).

The basic oxygen process of steel manufacture evolves a large volume of gas at high temperature during the oxygen blow. This gas contains finely divided oxide particles that are removed in gas-cleaning equipment. Either electrostatic precipitators or water scrubbers are commonly used for the purpose. These devices are quite efficient but breakdowns, usually in the auxiliary equipment, are frequent. Maintenance problems arise primarily from the high temperature of the gases which warps and cracks the plates in the hood that draws the gases to the cleaning device, and from erosion of piping caused by abrasive particles moving at high velocity. This paper presents a number of case histories of BOP gas-cleaning installations, details maintenance problems, and discusses corrective measures that have been adopted. It gives reasons why merely appropriating a large sum of money for cleaning devices does not always guarantee full abatement of air pollution from the basic oxygen process. -- Author's abstr.

- 1088 Application of X-ray Diffraction to the Determination of Chrysotile in Bulk or Settled Dust Samples. J. V. Crable and Marta J. Knott. *Am. Ind. Hyg. Assn. J.* 27, 383-387 (July-Aug. 1966).

The pursuit of an environmental study of the asbestos industry has emphasized the need for determining quantitatively, on a mass basis, the asbestos fibers present in bulk or settled dust samples. The use of x-ray diffraction in the analysis of industrial dusts is a widely accepted procedure. In the present paper a quantitative procedure has been developed for analyzing bulk or settled dust samples for chrysotile, the asbestos fiber most widely used in the United States asbestos industry. This asbestos mineral is a hydrated magnesium silicate with a crystalline structure which provides a distinct x-ray diffraction pattern of sufficient intensity to be used in quantitative analyses. X-ray diffraction is utilized for qualitative and quantitative determinations of this type of asbestos. The qualitative method establishes the presence of fibers in the dust samples and indicates possible interferences. An internal standard, aquamarine, is used in the quantitative determination of the asbestos mineral. This method for chrysotile is not limited to environmental samples but can be applied to l-g. samples of materials from other sources.

- 1089 Case Report. (Sequential Study with Aid of Single Breath Diffusing Capacity). J. H. Auchincloss and W. Vincent. *N. Y. State J. Med.* 65, 3025-3026 (Dec. 15, 1965).

From this short study, of which a typical case is presented, the authors suggest that the single breath diffusing capacity may be reduced during clinical exacerbations of farmer's lung, and may return to normal during remission. He also suggests that this change may occur during the presence of only mild symptoms and signs. Inasmuch as spirometric evaluation may not reveal conclusive abnormalities, it seems worthwhile to perform diffusion measurements in mild cases and to use the test in follow-up studies. -- APCA Abstrs.

- 1090 Effect of Dust Concentration Upon the Gas-Flow Capacity of a Cyclonic Collector. W. T. Sproull. J. Air Poll. Control Assn. 16, 439-441 (Aug. 1966).

The flow rate through an industrial gas-cleaning cyclone at a fixed pressure drop is greater when the incoming gas is dusty than when it is clean. This observation by Briggs for a single cyclone tube was extended to multiple tubes, and the results compared to observations by Soo and Trezek that the friction factor for turbulent flow in a pipe is less for dusty gas than for clean. Empirical considerations indicated that both of these observations should be connected with a rather large reduction in gas viscosity due to the dust. This predicted viscosity decrease was later observed. A physical theory accounting for viscosity reduction by a dust cloud is proposed. This effect also offers a means for increasing the heat transfer coefficient in gas heat exchangers.

-- Author's abst.

- 1091 Product Losses Cut With Centrifugal Gas Scrubber. H. L. Storch. Chem. Eng. Progr. 62, 51-54 (April, 1966).

A wet centrifugal gas scrubber with water-starch slurry was installed to recover entrained starch dust from 40,000 cu. ft./min., 140° F. effluent of two collection cyclones of a flash drying system producing 9 tons/hour of corn starch. Dust recovery and other aspects of this installation are discussed.

-- Public Health Eng. Absts.

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 1092 Environmental Hazards. Community Noise and Hearing Loss. J. D. Dougherty and O. L. Welsh. New Engl. J. Med. 275, 759-765 (Oct. 6, 1966).

Older age groups in industrialized countries have long shown decreased hearing. Available evidence supports the association of this hearing loss with noise and possibly with arteriosclerotic vascular disease. If the two combine to cause sensory loss, physicians have another aspect of preventive medicine to pursue with arteriosclerotic patients. For those with marked hearing loss, the first responsibility is that of education, both of the patient and of his family. Certainly, all persons with sensory loss are wise to avoid further noise exposure. Community planners should give special attention to noise hazards where people congregate. Considering the prevalence of hearing loss in the elderly, they deserve particular emphasis in noise control. They not only run the risk of further hearing loss, but also bear the burden of discriminating above annoying background noise. Many areas of the community, such as subways and other forms of transport, could achieve large reductions in noise with careful engineering. Public concern must be developed to achieve a reduction in community noise hazards, for most noise sources are now controlled by the individual and his purchasing habits. To reduce noise levels in the kitchen and on the street will first require the educated demands of the consumer. There are 12 references.

-- Authors' summary

- 1093 Aerodynamic Sound from Centrifugal-Fan Rotors. R. C. Chanaud. J. Acoust. Soc. Am. 37, 969 (1965).

Low-tip Mach numbers were used to measure the sound powers of small uncased centrifugal-fan rotors. Correlation of the data by use of a similarity relationship derived from theory was then employed, and it showed that the broad-band rotor sound is the result of randomly oriented dipole sources caused by fluctuations in fluid momentum. Deviations from the theoretically predicted dependence of sound power on speed were found. Speed dependencies less than those predicted can be explained as nearfield effect; the discrepancy between theory and the fan law for sound can be explained on the same basis. The fact that observed speed dependencies were greater than those predicted seems to result from having fixed frequency limits on the measurement system. A wedge placed near the rotor periphery was found to generate discrete-frequency dipole sound. Quadruple sound was negligible.

-- J. Occ. Med. Absts.

- 1094 Environmental Heat Studies. D. L. Stoddard. Am. Ind. Hyg. Assn. J. 27, 407-413 (July-Aug. 1966).

Several methods of evaluating industrial heat stress were investigated in relation to actual industrial heat problems. The method adopted was that proposed by Belding and Hatch (Heating, Piping Air Conditioning 27:129 (1955)). Their method was useful in: (1) offering a formula whereby the heat stress could be predicted prior to workers being exposed; (2) indicating clearly the factors contributing most to the heat stress and thus enabling an engineer to determine quickly those factors that could be varied with the best results in reducing the stress; and (3) making it

possible, under conditions where the stress could not be appreciably reduced, to estimate prior to job exposure safe working time for employees exposed to the stress. When applied to a man, the formula made it possible to determine, in advance, the margin of protection that the air-cooled suit would afford under a given set of conditions. The use of an air-conditioned recovery room at hot jobs not only will make recovery from each individual heat exposure more complete but will make it possible to work day after day in hot environments with a minimum loss of man power. There are five references.

-- Author's summary

- 1095 Measuring the Effect of Heat Stress on Workers. F.H. Fuller and L. Brouha. J. Am. Soc. Safety Eng. 11, 17, 20-22 (Oct. 1966).

The measurement of changes in heart rate due to work load and environmental temperature provides a useful method for evaluating effort and predicting the onset of fatigue. Individual variations in the heart rate are marked. In a given plant and in a group of workers performing the same task, some individuals may be unduly stressed due to age, physical condition, or chronic diseases. Therefore, to determine if a given man is working at a safe level, it is necessary to measure his reaction to the job. Until now, in evaluating plant job-environment conditions, the engineer has used mostly empirical indices such as Effective Temperature (ET), which is based upon averages. A new method based upon heart rate measurements has been developed to assist the engineer-medical team in evaluating suitability and in describing adequate job environment conditions for the individual as well as for groups. This method includes: (a) New thermal index called T-P index, T for dry bulb temperature, F.°; P for vapor pressure, mm. of mercury. (b) A formula for predicting heart rate values from the T+P index and metabolic rate, Btuh. Additional data are needed to extend the use of the above method to cover air velocity, radiation, and clothing. Therefore, the new method is intended only to supplement the Effective Temperature method described in this paper. It is suggested that others use the new method on their own data. The maximum permissible environmental temperature level from a physiological standpoint varies according to the work level. Temperature levels found to be satisfactory in the authors' heat-stress experiments were young, unacclimatized men stripped to the waist in still air. For practical application for the average worker, allow ten beats per minute below the new level. The authors results confirm that the Effective Temperature Index, though based upon subjective responses, is a good index of physiological reaction. However, it is not so useful as the new T+P index in that it does not provide a linear relation with physiological reactions. Because of this nonlinearity and because of limitations in its applicability to individual workers, the Effective Temperature concept should be supplemented with heart rate measurements, particularly if the job-environment condition is at or near the maximum recommended stress level. Eight references are given.

-- Authors' summary modified

- 1096 Man and Altitude. 1966 William P. Yant Memorial Award. A. Hurtado. Am. Ind. Hyg. Assn. J. 27, 313-320 (July-Aug. 1966).

Medical research at high altitudes still offers many valuable and interesting possibilities. From a physiological point of view much has been advanced in the understanding of the adaptive mechanisms responsible for an adequate tolerance to a condition of hypoxia, and also in the appreciation of the differences existing between acquired acclimatization, which concerns newcomers and temporary residents at high altitudes, and the so-called natural acclimatization related to the characteristics and processes found in subjects born and raised in this environment. However, important gaps remain to be filled in our knowledge of these problems. One aspect is the need for further data about the nature of tissular chemical processes which participate in the respiratory functions at cell level and in the production of energy. The importance of genetic factors in acclimatization to high altitudes has also not been studied. It is not known to what extent a man born at high altitudes brings to this environment inherited characteristics, to be added to those developed when contact with hypoxia is established at birth. The fact that a native man in these regions has, retrospectively, thousands of years of continuous exposure cannot be ignored. The influence of a high-altitude environment, and of the consequent hypoxia condition, on the incidence, evolution, and prognosis of certain diseases constitutes a problem which still awaits research interest. It is not known if immunological processes are subject to certain modifications, and in this regard there are some challenging observations.

-- Cond. from author's conclusions

03122315

RADIOACTIVITY AND X-RADIATION

- 1097 Occupational Health Programs in Civilian Nuclear Power Reactor Facilities. J.H. Spickard. J. Occ. Med. 8, 261-262 (May, 1966).

Information from ten civilian nuclear power reactor facilities indicate that all have developed medical programs. Medical care is provided by physicians in the community, generally under the supervision of a parent medical department. Areas for future consideration are whole-body counting programs and emergency planning. -- Author's summary

- 1098 Philosophical Influences on Radiation Protection Standards. L.S. Taylor. Health Physics 11, 859 (Sept. 1965).

Radiation protection standards develop as a result of philosophies and practical considerations. There are technical and nontechnical influences. Presently the radiation guides are at such a low level that further reduction might seriously hamper the economic and scientific use of radiation. International and national bodies, each with special interests, serves to complicate the philosophical approach to the problem of balancing hazards of radiation against benefits from its use. Whether the multiplicity of groups concerning themselves with standards-making activity is good or necessary is an open question. -- J. Occ. Med. Absts.

- 1099 Effect of Humidity and Dose on Latent Image Stability. R.L. Kathren, P.R. Zurakowski, and Margaret Covell. Am. Ind. Hyg. Assn. J. 27, 388-395 (July-Aug. 1966).

After exposure to 0, 0.1, or 1 R, personnel monitoring films were held for up to 17 weeks prior to development at $20 \pm 0.5^\circ\text{C}$. and a constant relative humidity of less than 1, 28, 52, or 98%. At 98% relative humidity, pronounced latent image fading occurred. The fading rate was greatest during the first few weeks postexposure, becoming negligible after the sixth week. The fraction of the latent image that faded as a function of time, was independent of exposure. Films held as long as three months at 28 or 52% relative humidity showed no latent image fading. When maintained at less than 1% relative humidity, films showed a uniform linear increase in density as a function of time. This fogging was independent of previous exposure and was not attributable to background radiation. Films encased in 0.005 inch thickness of polyethylene exhibited little or no fogging or latent image fading over a three-month period. Protective packaging is suggested for film-wearing intervals greater than two weeks at relative humidities outside the 35 to 70% range. -- Authors' abst.

- 1100 A Plutonium Particle Size Study in Production Area at Rocky Flats. R.A. Kirchner. Am. Ind. Hyg. Assn. J. 27, 396-401 (July-Aug. 1966).

Accurate determination of particle size is important to evaluate properly the hazards from airborne contamination. It is generally recognized that particle size is an important parameter affecting respiratory retention, absorption, clearance, and translocation mechanisms. Since the U.S. Atomic Energy Commission regulations allow an adjustment of permissible air concentrations based on a measured "respirable fraction," accurate particle size analyses could also have economic importance. In the present investigation particle size analyses of 16 air samples obtained during maintenance operations which caused high airborne concentrations of plutonium in chemistry and fabrication plants are reported. The air samples showed an average mass median diameter (MMD) of 0.884 micron and an average count median diameter (CMD) of 0.213 micron. The average geometric deviation (σ_g) was 2.02. Particle size spectra obtained during simulation of two personnel inhalation incidents showed MMD's of 4.1 ($\sigma_g = 2.36$) and 1.2 ($\sigma_g = 1.84$) microns. All analyses related the number of alpha tracks on Kodak Type A personnel neutron film to the size of PuO_2 or PuF_4 particles on membrane filter paper. There are ten references.

- 1101 Effects of Pulsed Fission Spectrum Neutron Irradiation. A Study of Hematological Responses in Sheep. M.A. Quaife and L.T. Odland. J. Occ. Med. 8, 120-126 (March, 1966).

Sheep were given uniform whole-body exposure to varying doses of pulsed fission spectrum neutrons (neutron to gamma ratio, 5:1) in order to define the response of the hematopoietic system to this form of ionizing radiation. Four groups of 12 subjects each (with four controls) were given 218, 359, 476, and 518 rad, respectively, after which the classic parameters of hematopoieses were assayed for a period of 60 days. Lymphocytes displayed a rapid and significant decrease in all dose groups, but of less magnitude in the 218-rad herd. Mature granulocytes followed a similar pattern, but survivors of the two higher doses exhibited marked "over recovery." Thrombocyte response was dose-dependent in the lower dosage groups, and in all survivors, good recovery

was noted by D+30. Erythropoiesis was relatively undisturbed, as measured by the methods employed. Results of this study suggest that neutrons are less damaging to the blood-forming organs than equal exposure doses of x- or gamma rays. This is most probably the result of their inability to penetrate tissue and bone to the same extent. Similarities and differences of the findings of this study with applicable literature reports are presented. There are 18 references.

-- Authors' summary

ENVIRONMENTAL MEASUREMENTS

- 1102 Automatic Carbon Monoxide Monitor. J.C. Barrett, R. Bennett, and J. Buckmaster. Am. Ind. Hyg. Assn. J. 27, 402-406 (July-Aug. 1966).

Michigan's Division of Occupational Health has a unique instrument for continuously monitoring and recording carbon monoxide concentrations. Maximum concentration recorded is 200 ppm, with a sensitivity of ± 2 ppm. Built in are automatic circuits allowing the instrument to purge, check zero reading, and check upscale (185 ppm) calibration once every 12 hours. All components are housed in an aluminum case 13-3/4 by 31-3/4 by 17-3/4 inches, weighing 105 pounds. It is possible for one engineer to transport it and set it up. One year's field experience has shown that the instrument is reliable and will operate in the field up to 36 hours, with minimum supervision. Five references are given.

-- Authors' abst.

- 1103 Air Sampling and Analysis With Microcolumns of Silica Gel. E.E. Campbell and H.M. Ide. Am. Ind. Hyg. Assn. J. 27, 323-331 (July-Aug. 1966).

This paper describes a simple microcolumn of silica gel, its behavior under experimental conditions and its applicability to air sampling. Data are presented for the ultraviolet spectral absorbance analysis of selected aromatic hydrocarbons, using a base line correction for background interference. The problems of direct silica gel elution and ultraviolet spectrophotometry are discussed, and resolution of the particulate background problem by base line calculations is shown. The silica gel microcolumn is proved simple, practical, and highly efficient for sampling air contaminants. Although only spectrophotometric analysis of eluates is reported here, other methods of analyzing the sorbed contaminant are suggested.

-- Authors' abst.

- 1104 Perfluoroisobutylene and Hexafluoropropene Determination in Air. K. Marcali and A.L. Linch. Am. Ind. Hyg. Assn. J. 27, 360-368 (July-Aug. 1966).

Both perfluoroisobutylene (PFIB) and hexafluoropropene (HFP) react in methanol with a mixture of pyridine and piperidine to produce a stable yellow color at 25° to 40° C. which is measured spectrophotometrically at 412 millimicrons or visually compared with permanent secondary standards. In the presence of acetic acid only HFP undergoes the color-forming reaction with piperidine. The PFIB concentration can be determined by difference. The effect of various halogenated compounds with and without the $R-C=CF_2$ ($R = -F, -CF_3$) function is presented. With a 0.1 cubic foot sample at 25° C., the method will detect 0.1 ppm of PFIB or 0.02 ppm of HFP. A lightweight easily portable field kit with a "Uni-Jet" aspirator has been developed for field surveys. There are 22 references.

-- Authors' abst.

- 1105 The Continuous Monitoring of Traces of SO₂ in Air on the Basis of Discolouration of the Starch-Iodine Reagent With Prior Elimination of Interfering Compounds. C. Bokhoven and H.L. Niessen. Intern. J. Air and Water Poll. 10, 233-243 (April, 1966).

A continuous recording instrument for sulfur dioxide monitoring in air pollution studies was developed on the basis of the discoloration of a starch-iodine solution. As distinct from the normal procedure, however, the disturbance by interfering compounds, such as nitrogen dioxide and ozone, can be eliminated without affecting the concentration of sulfur dioxide. By incorporating an integrating device, 1/2-hour mean values can be printed out. The applicability of these values is discussed with reference to the time constant concept. Nine references are given.

--Public Health Eng. Absts.

- 1106 A Rapid Titrimetric Method for Sulfate in Lead Dioxide Exposed to Atmospheric Sulfur Pollution. A.C. Rayner. J. Air Poll. Control Assn. 16, 418-421 (Aug. 1966).

A titrimetric method is described for the analysis of sulfate in lead dioxide candles which have been exposed to atmospheric sulfur pollution. The time taken to analyze one sample is three hours. Sixty milliliters of 8% ammonium carbonate solution is used to convert the lead sulfate

present on the candle to ammonium sulfate. The solution is filtered to remove lead dioxide, and an aliquot of the filtrate is heated to remove ammonium carbonate. The solution of ammonium sulfate remaining is titrated directly for sulfate with 0.02 M barium perchlorate, using Thoron as indicator. The accuracy of the method is ± 10 and $\pm 6\%$ of theoretical, for 10 mg., and 40 mg. or greater amounts of sulfate, respectively. For 2 mg. of sulfate, results are about 20% high. Good agreement has been obtained between results for duplicate field candles, analyzed by the standard sodium carbonate gravimetric method, and the method presented, over a five-month period. There are five references. -- Author's abst.

- 1107 Measurement of Airborne Asbestos Dust by Instruments Measuring Different Parameters. S.A. Roach. Ann. N.Y. Acad. Sci. 132, 306-315 (Dec. 31, 1965).

The size and shape of the airborne dust was measured in five samples taken with a Casella thermal precipitator. These samples were examined with a light field microscope using a 2 mm. oil immersion objective having a numerical aperture of 1.30. The results of fiber and particle counts are discussed. The counts obtained varied with the sampling instrument and particular microscope assembly used. Results obtained by four sampling instruments are shown in table 5. The work described in this report was undertaken to determine a suitable method of measuring the dust exposure of many workers for some years in studies of the effects of inhaling asbestos dust. -- APCA Absts.

COMMUNITY AIR HYGIENE

- 1108 Test Procedures for Evaluation of Industrial Fume Converters. M.J. Bolduc, R.K. Severs, and G.L. Brewer. Air Eng. 8, 20-23 (Feb. 1966).

Catalytic fume converter units, located at four different test sites and representing four different applications, have been evaluated by using the source test procedure. This systematic source test procedure evaluates the pollution control equipment as to reduction of pollutant substances, emission of particulate matter, identification of pollutants, and determination of the concentration of odors in the effluent from the converter. -- Public Health Eng. Absts.

- 1109 Mist Removal From Compressed Gases. J.A. Brink, Jr., W.F. Burggrabe, and L.E. Greenwell. Chem. Eng. Progr. 62, 60-65 (April, 1966).

Many compressed gases in industry contain submicron mist particles. This article describes how such mists are formed and how they can be collected with fiber mist eliminators. Plant-scale installations are described. Ten references are given. -- Public Health Eng. Absts.

- 1110 Fume Scrubbing With the Ejector Venturi System. L.S. Harris. Chem. Eng. Progr. 62, 55-59 (April, 1966).

The results of theoretical and experimental investigations showing the scrubbing efficiencies and other characteristics of the ejector venturi scrubber are discussed and presented in the form of a few basic equations and various graphs. Corresponding history of field applications is also discussed. Ten references are given. -- Public Health Eng. Absts.

- 1111 The Fuel Additive Approach toward the Alleviation of the Nuisance of Diesel Smoke. I. Glover. J. Inst. Petrol. 52, 137-160 (May, 1966).

A new approach in the field of fuel additives which can reduce diesel exhaust smoke to acceptable levels is discussed. Factors causing exhaust smoke, apparatus for measuring smoke, methods of measuring smoke from vehicles, development of smoke suppressant and mechanism of the additive, manufacturers engine tests, and field tests are described. -- APCA Absts.

- 1112 Electrostatic Precipitation. E.P. Stastny. Chem. Eng. Progr. 62, 47-50 (April, 1966).

Oleum production forms particles less than 2 microns in size that fail to respond to mechanical means for eliminating visible stack residual. Pilot studies with electrostatic precipitation cleared up the stack discharge. The presentation includes the development of full-size electrostatic precipitator application to oleum stack gas cleanup. -- Public Health Eng. Absts.

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- 1113 British Charts for Heights of Industrial Chimneys. G. Nonhebel.
Intern. J. Air and Water Poll. 10, 183-189 (March, 1966).

The author reports on the value and acceptance of the British Ministry of Housing and Local Government report "Memorandum on Chimney Heights." Examples are given of charts relating height of chimney with sulfur dioxide emission rate and additional height requirements when down-draft from adjacent buildings are expected. Minimum effluent velocities are stated. The average maximum groundlevel concentration of sulfur dioxide from the recommended heights is 16 ppb by volume (0.45 mg./N cu.m.) for three minute sampling time when calculated from the Bosanquet-Sutton equations. Some account is taken of contaminants other than sulfur dioxide. There are 11 references.

-- Public Health Eng. Absts.

- 1114 Comparison of Wind at 500 Feet Over Minneapolis and Louisville With Geostrophic Wind.
R.J. Deland and F.S. Binkowski. J. Air Poll. Control Assn. 16, 407-411 (Aug. 1966).

Measurements of wind speed at 500 feet on a television tower in the Minneapolis-St. Paul area are compared with geostrophic wind speeds and lapse rates. The roughness length for the built-up area surrounding the tower is estimated using geostrophic boundary-layer models. Similar data for Louisville are also considered. The results are relevant to the application of existing boundary-layer models to the estimation of wind speed and turbulent mixing over a city.

-- Authors' abst.

- 1115 The Seasonal, Weekly, and Daily Cycles of Atmospheric Smoke Content in Central Montreal.
P.W. Summers. J. Air Poll. Control Assn. 16, 432-438 (Aug. 1966).

The hypothesis of a continuous nighttime "fumigation" process over a large urban area is proposed, in which case the morning peak in soiling index can be explained by an increase in smoke production as the city comes to life. The seasonal, weekly, and daily cycles of smoke pollution in Central Montreal combined with this simple urban ventilation model yield a useful estimate of the contributions from various smoke source categories. The concept of a ventilation coefficient is introduced and its seasonal variation gives some insight into the various types of diurnal variations of soiling index observed in Montreal. There are 19 references.

-- Cond. from author's discussion

- 1116 The Accumulation of Fluorine by Plants. J.S. Jacobson, et al.
J. Air Poll. Control Assn. 16, 412-417 (Aug. 1966).

The accumulation and distribution of fluorine (F) in plant leaves have been studied to better understand the response of plants to concentrations of atmospheric fluoride (F) that are similar to those found in urban or industrial areas. The results indicate that F from the air can be adsorbed to the surface of leaves as well as accumulated internally and that F in leaves can be translocated outward to the surface as well as upward to the tips. F injury and accumulation can be induced in any desired location on a gladiolus blade by restricting gas exchange of the blade, indicating that all parts of a blade are sensitive to F-induced injury. It is, therefore, suggested that the wide differences often found between plant species and varieties with respect to both susceptibility to injury and degree of F accumulation may be explained by differences in the means of accumulation, translocation, and distribution of F. F remains in a soluble form in plant leaves and maintains the chemical properties of free, inorganic F. The solubility and mobility of F and the ease of removal from plant tissues indicate that irreversible binding to cellular components does not occur. There are 24 references.

-- Authors' abst.

- 1117 Ozone and Sulfur Dioxide Synergism: Injury to Tobacco Plants. H. A. Menser and H. E. Heggstad.
Science 153, 424-425 (July 22, 1966).

Tobacco plants displayed ozone-type injury when exposed to mixtures of ozone and sulfur dioxide at subthreshold concentrations. The syndrome suggests synergism between ozone and sulfur dioxide that lowers thresholds to injury; exposure to the individual gases at the mixed-gas concentrations caused no symptoms.

-- Authors' abst.

IN RE: ABRAMS November 1992

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MANAGEMENT ASPECTS

- 1118 A Medical Program to Assist Management in the Control of Absenteeism. D.C. Bews.
J. Occ. Med. 8, 243-250 (May, 1966).

It is suggested that management, in initiating action for control of sickness absence, should always carefully consider the employee's needs, real or imagined. The first step should always be to see whether this employee's performance can be improved. Excessive incidental absence is often a manifestation of the individual's inability to meet the demands of work or of society in general. The approach should always be to discover the reason and to assist the employee toward the solution of these problems.

ACCIDENTS AND PREVENTION

- 1119 Medical Evaluation of the Commercial-Vehicle Driver. A Guide for the Industrial Physician.
Industrial Medical Association, Committee on Medical Aspects of Driver Safety.
J. Occ. Med. 8, 274-279 (May, 1966).

Industry is the ideal environment for the study of motor-vehicle accidents because the drivers are under observation and well-controlled conditions. Accurate records of their accidents are maintained by the safety department. Observations learned in industry may be utilized for civilian drivers and assist in developing standards for all driver licensing. It is important for the industrial physician to keep accurate records of the physical and mental condition of the driver and to compare these with the accident rate. It is important to understand that in addition to the medical problems, there are other factors involved in motor vehicle accidents. It is necessary to improve the roads and highways, to improve the safety design of motor vehicles by adding padded interiors, safety door catches, rigid-frame tops, and safety belts and harnesses. Licensing procedures must be uniform and improved. Law-enforcement procedures require improvement. Driver education is essential. Education of the public must be carried on aggressively in order to obtain understanding cooperation in the promotion of safe driving. Only when all the factors of motor vehicle accidents have been properly weighed and people convinced that action is necessary will the toll of death and injury be reduced.

- 1120 Control of Toxic and Explosive Hazards in Buildings Erected on Landfills. M.W. First,
F.J. Viles, Jr., and S. Levin. Public Health Repts. 81, 419-428 (May, 1966).

The results of periodic gas samplings conducted over several years in the subbasement spaces of a number of buildings constructed on sanitary landfills indicated that organic fill located around and under heated buildings becomes completely degraded in approximately five years. Methane is released at a proportionately rapid rate.
-- Public Health Eng. Absts.

- 1121 Computing a True Accident Frequency Rate. C.D. Attaway.
J. Am. Soc. Safety Eng. 11, 9-10, 12-13 (Oct. 1966).

It is obvious that statistics can be produced which will present a true picture to management of the work accident experience. First, the disabling work injury frequency rate and severity rate formula using one year as a unit will present a factual record and reflect gain or loss in accident prevention efforts to reduce personal injury. Secondly, an all-accident frequency rate is necessary to present a factual record of both work injuries and property damage to reflect gain or loss in accident prevention efforts to reduce property damage as well as personal injury. Coupled with this should be a "cost per capita" figure that will reflect the cost of accidents. Thus management will have at its finger tips statistics that will show the number of disabling work injuries, the number of property damage accidents, the cost of these accidents, and whether the accident experience is improving or deteriorating. Furthermore, if these rates were made into a standard formula equitable comparisons could be made between companies in the same industrial classification, between specific operations within an industry, and between different industrial classifications. An added benefit in the interest of truth and honesty would be the determination of contest winners based on their actual accident experience instead of only disabling work injuries and thus recognize true accomplishment in accident prevention. Humanitarianism, employee morale, and company image are all highly important factors in the safety effort, but company profit or loss is management's first concern and effective accident prevention work should and will produce profit. The statistics and records should confirm the accomplishment, not obscure the losses and failures.
-- Author's conclusion

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