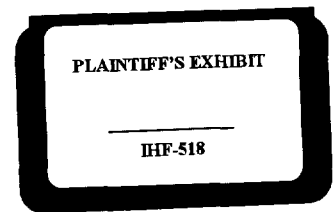


*Dr. C. S. Bishop
Nemark Plant*



Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL

AUGUST, 1968

(Vol. 32, No. 8)

INDUSTRIAL HYGIENE FOUNDATION

4400 FIFTH AVENUE -- PITTSBURGH, PA. 15213

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INDUSTRIAL HYGIENE FEATURES

The prevalence of chronic disease among problem drinkers is reviewed in Abst. No. 722.

Abst. No. 726 is concerned with the knowledge of public health among medical students.

The role of environmental temperature and humidity in susceptibility to disease is described in Abst. No. 729.

Tuberculosis risk in students of nursing is the topic of Abst. No. 734.

Data on petit mal status in adults is given in Abst. No. 737.

Abst. No. 740 presents primary lung cancer under the age of forty.

Abst. No. 745 investigates cat-associated tularemia.

FOUNDATION FACTS

NEW MEMBERS: IHF is pleased to announce the addition of three new members:

AutoFlo Company, SysMed Corporation, Arthur C. Withrow Company

STAFF ACTIVITIES: The epidemiological field survey in connection with the Foundation's sponsored research on fibrous glass was continued in August by Dr. Robert T. P. deTreville, President, and Dr. Benjamin J. Lambiotte, IHF Fellow in Occupational Medicine.

1968 BIOSTATISTICAL WORKSHOP: Thirty-four representatives of member companies and invited guests attended the Foundation's 1968 Biostatistical Workshop on July 29-30, at Webster Hall Hotel. Chaired by Dr. Philip E. Enterline, Professor of Biostatistics at the Graduate School of Public Health, University of Pittsburgh, and IHF Advisory Fellow, the meeting provided a means of critically reviewing past experience in sick absence reporting and indicating certain needs and opportunities for cooperative biostatistical studies and services within the Foundation's membership. Proceedings of the Workshop are in preparation as a Medical Series Bulletin and will be published in the near future.

CLOSING ON NEW HEADQUARTERS BUILDING: August 29 is the closing date set for completing the purchase of the building at 5231 Centre Avenue, Pittsburgh, Pa., IHF's new headquarters location. Plans are developing to move the administrative staff shortly thereafter. Information regarding change of address and telephone number will be announced prior to the move.

INDUSTRIAL HYGIENE HIGHLIGHTS—VOL. 1: Copies of Industrial Hygiene Highlights - Vol. 1 are off the press and will be mailed in August, as they become available, directly from the printer. Those who have not placed orders may do so through IHF headquarters—per volume cost is \$20.00.

33rd ANNUAL MEETING:* Keynote speaker, Dr. Lewis J. Cralley, Scientist Director, Associate Chief of the U. S. Public Health Service Occupational Health Program (Field Studies) will open the Management Conference morning session, October 15, speaking on "National Occupational Health Planning." Discussing Dr. Cralley's paper will be IHF Trustee Dr. James H. Sterner, Chairman of the Department of Environmental Health, University of Texas School of Public Health. (See Editorial, "National Occupational Health Planning," this issue, p. ii.) Complementing this, James M. Brown, Professor of Law, The George Washington University, will talk about "Planning Disaster Control in Industry." Andrew Kalmykow, Counsel, American Insurance Association and Vice Chairman, IHF Board of Trustees, will report on "Progress in State Compensation and Rehabilitation Programs in 1968" to close the morning session.

The Scientific Conference, October 16, features outstanding speakers among whom are Dr. Gerhard A. Brecher, Distinguished Professor of Physiology, University of Oklahoma Medical Center, discussing "Physiological Effects of High Levels of Illumination" (see Editorial, "Health Effects of Lighting," this issue, p. ii). Dr. H. Christian Zweng, Principal Investigator, Laser Eye Hazard Project, Stanford Research Institute, will present "Thresholds of Laser Eye Hazards in Primates," and Dr. Jurg A. Schneider, Director of Research of Dupont's Pharmaceutical Division, will describe "Biochemical Building Blocks for Health."

*33rd Annual Meeting - October 15-16, 1968 - Chatham Center, Pittsburgh, Pa.

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KARL ANDERS OTTERLAND. M.D.

APPOINTED

IHF ADVISORY FELLOW



Dr. Karl Anders Otterland, Professor of Epidemiology, Graduate School of Public Health, University of Pittsburgh, has accepted an appointment to Mellon Institute as Advisory Fellow, serving the Industrial Hygiene Foundation.

Born in Falkoping, Sweden, Dr. Otterland received his educational and professional training in the surrounding area. He received the Doctor of Medicine degree from the University of Stockholm, Karolinska Medicokirurgiska Institutet in 1950 and subsequently entered into postgraduate specialized training programs dealing with general and military hospitals, psychiatric clinics, community mental health programs, dermatology, physical medicine and rehabilitation, public health programs, and epidemiology and preventive medicine. He also held consultant and committee appointments, participated in research programs and assumed teaching responsibilities. Dr. Otterland joined the Department of Epidemiology and Microbiology in the Graduate School of Public Health September 15, 1967.

The July, 1968, issue of Industrial Hygiene Digest contains a book review of "A Sociomedical Study of the Mortality of Merchant Seafarers" by Dr. Otterland, which is one of the outstanding publications of his many papers, articles and lectures which have been published and presented. He is a member of the American Public Health Association, Swedish Medical Association, Swedish Medical Society and American Association of University Professors.

Dr. Otterland participated in the Foundation's Biostatistical Workshop held July 29-30, 1968, and will continue to aid in the development of IHF's biostatistical services for industry.

EDITORIALS

NATIONAL OCCUPATIONAL HEALTH PLANNING

"Industrial Hygiene Foundation (IHF) offers a point of management planning for governmental representatives having related missions, through collaborative programs of health conservation," reads the concluding sentence of Industrial Hygiene Digest Editorial: "National Occupational Safety and Health Goals and Progress in 1968" (Vol. 32, p. iii, March, 1968). The editorial appears in the Hearings of the Select Subcommittee on Labor of the Committee on Education and Labor, House of Representatives 90th Congress, reviewed elsewhere in this issue (see Abstract No. 719 on p. 6 regarding H. R. 14610).

The 33rd Annual Meeting* keynote speaker on the subject, "National Occupational Health Planning" will be U. S. Department of Health, Education and Welfare, Public Health Service's Dr. Lewis J. Cralley, Scientist Director and Associate Chief, Occupational Health Program, Epidemiology and Field Studies. Dr. Cralley, who is also currently serving as President of the American Industrial Hygiene Association, is eminently qualified to speak for the field of Industrial Hygiene Research: he is co-editor of IHF's new publication—Volume I of Industrial Hygiene Highlights (in which he personally authored the section on Epidemiology of Occupational Diseases). He has cooperated in the Foundation's planning and execution of studies of fibrous dust hazards and their control. His outstanding efforts towards furthering collaborative research and educational efforts between industry (in IHF), government, universities, and private institutions exemplify available scientific leadership, on which future national occupational health planning must depend. Dr. Cralley's talk, which will stress need for greater progress in employee and public health conservation programs, will be discussed by IHF Trustee Dr. James H. Sterner, who retired as Medical Director of Eastman Kodak earlier this year to become Professor of Environmental Health of the Graduate School of Public Health of the University of Texas (Houston). Dr. Sterner was quoted before the Holland Committee (see p. 6) by Dr. Clyde M. Berry, then President of American Industrial Hygiene Association, regarding need for a National Council on Hazardous Physical and Chemical Agents. Upon leaving the Foundation's Biostatistical Workshop on July 30, 1968, Dr. Sterner proceeded to Washington, D. C., to present testimony before Senator Muskie's committee on the same subject. Dr. Sterner's discussion of Dr. Cralley's talk promises to be a significant contribution towards genuine progress in Environmental and Occupational Health and accomplishment of the Foundation's mission. Government's role can be chiefly regulatory or supportive of industry: which it will be depends upon whether IHF's mission and progressive programs represent a large—or a small sample—of American Industry. It is important for management representatives in the Foundation's member companies to understand that without their help we cannot insure survival of the voluntary system of self-regulation expressed in the Foundation's existence and activities. Plan to come and bring your management associates from companies not yet members to hear Drs. Cralley and Sterner's messages and be guided by them. According to the letter of transmission from Dr. Murray C. Brown regarding the above Bill, "The extensive hearings produced an amended version of H. R. 14610. The subcommittee version, H. R. 17748, was further amended and has gone to the Rules Committee. The Senate is holding executive sessions on the Bill and is expected to report a Bill out very shortly. Chances for passage of the legislation are not good before adjournment. However, Congress is expected to be called back into session which will then enhance the chances for passage of the Bill." The time for IHF's members to provide leadership needed to help industry shape future developments in Environmental and Occupational Health is now.

--R. T. P. deT

HEALTH EFFECTS OF LIGHTING

"Does Lighting Affect Health?" is the topic of Abstract No. 783 in this issue. Participants in the Foundation's Fourth Engineering Discussional held January 9-11, 1968, (see Industrial Hygiene Digest February, 1968) pointed out that there is need for better communication between illumination engineers and health scientists regarding health effects of lighting. One industrial physician, for example, expressed concern over requests for tinted lenses (at his company's expense) from employees working in an area in which the recommendation has been made by an illumination engineer for an even further increase in the level of illumination. These two seemingly disparate requests are not necessarily antithetical. Cause of most such complaints is undoubtedly glare, which even at low levels of light intensity often presents a problem; but if the intensity of visible light itself can present recognized health effects of any type, these should be known to health service personnel. Dr. Gerhard A. Brecher, Distinguished Professor of Physiology, University of Oklahoma Medical Center, will address the Foundation's 33rd Annual Meeting Scientific Conference on this subject on October 16. Preliminary programs will be mailed later this month to Foundation members. Attendance by others than members is by invitation only; however, interested industrial hygiene management representatives of companies not now members of IHF may be invited on the recommendation of an IHF member company, trustee, committee or staff member.

--R. T. P. deT

*October 15-16, 1968, at Chatham Center, Pittsburgh, Pa.

INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

704 Ill Miners' Pension Hopes Dim. No Money in State Budget.

The Shafer Administration has rejected a House-approved bill increasing the monthly payment from \$75 to \$100. No money is in the budget for such an increase. Many thousands of other retired miners—in addition to the 21,584 receiving payments through the Department of Labor and Industry this month—will be affected, since there are countless applications still to be processed. Pennsylvania is one of the few, if not the only State to absorb the cost, paying claims from miners who contracted silicosis or other industrial diseases. The legislature agreed in 1939 to pay 50 per cent of the cost that year under a proposal which would remove the State participation within 10 years. Instead, the State over the years increased its share of the cost. The program, after being phased out, was revised in 1952 with State taxes handling 40 per cent of the total claims. With a substantial increase in applications by then, the total cost to the taxpayers reached \$1 million. In 1953, when a court questioned the liability of employers for occupational disease payments, the legislature approved a bill requiring the State to pay the full compensation. Since then, the program's cost has gone from \$8.6 million in the 1955-57 fiscal period to \$57 million for the present fiscal year.

--Cond. from Pittsburgh Press, Sect. 1, p. 11, Sunday, July 21, 1968

Editor's Note: For more on this subject see IHF Medical Series Bulletin No. 12 "The Pneumococcoses. A limited number of copies are available to members at \$1.00 ea. (non-members \$1.50 ea). --R.T. P.deT

705 Nursing in Industry.

Approximately 50 million men and women in this country are employed in plants that are too small to provide preventive health services. This fact is contained in a new pamphlet entitled "Public Health Nursing in Industry" published by the Occupational Health Program of the National Center for Urban and Industrial Health in Cincinnati. Dr. Murray C. Brown, Chief of the Occupational Health Program, said the pamphlet was developed to outline for state and local health officials how such programs can be established. The pamphlet includes examples of the public health nurse's role in first-aid programs, immunization programs, health and safety education programs, and counselling services. Dr. Brown said that three local health departments in the country have pioneered in providing public health nursing to small industries. They are the health departments in Clay County part of (Kansas City) Mo., Hillsborough County (Tampa) Fla. and Detroit, Mich. He said he hoped all communities would incorporate this type of program in their health departments. Copies of the pamphlet are available upon request from: Chief Nurse, Occupational Health Program, National Center for Urban and Industrial Health, Public Health Service, 222 E. Central Parkway, Cincinnati, Ohio 45202.

--U. S. Dept. of Health, Education, and Welfare Release, July, 1968

706 Obesity and the Industrial Worker.

The overweight industrial worker, a public health scientist declares, is often less able to cope with some of the health hazards encountered in the daily performance of the job than his thinner co-worker. Dr. Austin Henschel, of the Public Health Service's National Center for Urban and Industrial Health, Cincinnati, Ohio, says that evidence indicates, for example, that the fat worker tires more quickly than others and has more difficulty withstanding heat. Dr. Henschel is a staff member of the National Center's Occupational Health Program. His findings were contained in a study of obesity as a special problem of the industrial worker. "A job that could be done with relative ease by a lean, muscular person," he states, "could significantly fatigue the obese person. As one's weight increases, so does the work required just to stand and move about. If the physical work must be done under even moderately hot environmental conditions," he adds, "the obese individual is in danger of becoming a heat casualty." Dr. Henschel also finds that obese workers are more likely to develop respiratory strains, bringing on not only distress but an increased hazard in breathing in airborne dusts and toxic particles. Obesity is found to invite on-the-job accidents because of reduced agility and inadequate work space or work layout that produces fatigue or strain. The obese tunnel worker, Dr. Henschel says, also runs a greater risk of decompression bends and there is some belief that an overweight jet pilot would be at a disadvantage due to a lowered altitude tolerance. The study says that the obese worker not only faces special health problems, but also runs the risk of not being considered for many types of jobs. "Obesity itself," Dr. Henschel concluded, "must be considered as a significant occupational hazard." Copies of the study are available to those writing to Dr. Henschel, 1014 Broadway National Center for Urban and Industrial Health, Public Health Service, Cincinnati, Ohio 45202.

--U. S. Dept. of Health, Education, and Welfare Release, July, 1968

707 Longevity and Occupation.

Prominent professional and business men live distinctly longer on the average than men in the general population, according to statisticians of Metropolitan Life Insurance Company. Some groups among them—notably scientists, educators, and clergymen—show particularly favourable longevity. These conclusions were reached on the basis of a 12-year follow-up study of 6329 distinguished professional and business leaders who comprised a one-sixth sample of all the men included in the 1950-51 edition of "Who's Who in America". The mortality of the prominent men in this study was 30% below that of white males in the general population and about 15% below that of males insured under standard ordinary policies. Business executives and lawyers showed a death rate close to the average of the prominent men studied. Physicians and surgeons recorded mortality rates 10% higher and government officials nearly 20% higher than average. On the other hand, college professors and clergymen registered death rates from 10 to 15% below average. Correspondents and journalists, with death rates about double those of all the men studied, had the least favourable record. Men of letters as a group had a mortality rate 30% higher than the average. The best record for longevity was made by scientists, whose mortality rate was approximately 20% below average.

--Can. Med. Assn. J. 98, 43 (June 22 & 29, 1968)

708 Noise Limits for Workers.

Top management and labor officials of American industry were invited recently to comment on a set of proposed new noise limits for workers. The ceilings range between the approximate noise of a power lawn mower to that produced by a road worker's air hammer. Herbert H. Jones, associate director of the Public Health Service's National Noise Study, asked that comments be forwarded to him. The National Noise Study is an activity of the National Center for Urban and Industrial Health, Cincinnati. "Millions of workers now are exposed to the kind of noise produced by an air hammer--or worse--every working day," said Jerome H. Svore, Director of the National Center. "Some suffer loss of hearing because of it." The proposed noise limits were approved at the recent annual meeting of the American Conference of Governmental Industrial Hygienists. If approved again at the Conference's meeting in May of 1969, they may be enacted into law in many states. The precise noise limits are as follows: For a worker exposed 4 to 8 hours a day--92 decibels, as measured on the A scale of a sound level meter (expressed as 92 dBA). For a worker exposed to noise 2 to 4 hours--97 dBA. For a worker exposed to noise 1 to 2 hours--102 dBA. For a worker exposed to noise less than 1 hour--107 dBA. Comments on the proposed limits should be sent to Herbert H. Jones, chairman of the Physical Agents Committee, American Conference of Governmental Industrial Hygienists, 1014 Broadway, Cincinnati, Ohio 45202.

--U. S. Dept. of Health, Education, and Welfare Release, July, 1968

709 Massachusetts Advances Fluoridation.

Several towns and cities in Massachusetts have voted for fluoridation during the past year. Recently installing fluoridation equipment are: Amesbury, Holyoke, Newburyport, Wenham and Westminister. In addition Littleton, Weston, Swansea and Somerset have voted for fluoridation in 1968.

--Conn. Health Bull. 82, 151 (June, 1968)

710 APCA Sets New Record in St. Paul.

A record of 2995 registrants attended the 61st Annual Meeting of the Air Pollution Control Association during their sessions at St. Paul, Minnesota, June 23-27. This attendance figure broke all records by almost 500, set the previous year in Cleveland. Vice-President Hubert H. Humphrey addressed the keynote session and said his policy on environmental problems, if elected next fall, would be to determine how we can produce a more wholesome, safe and healthy environment. Over 1600 people were present while National Television Networks recorded his keynote address. Over 200 Technical Papers were presented in thirty six sessions and there was an informative plenary session on the interpretation of the Air Quality Act of 1967, which authorizes expenditures of one-half billion dollars by the Federal Government in the next three year period. APCA's President, Robert L. Stockman, Executive Director of the State of Washington's Air Pollution Control Program presented the Association's Frank A. Chambers AWARD to Sir Oliver Graham Sutton of London, England for his life-long accomplishments in the field of micrometeorology. The Citation reads in part, "...his great pioneering effort has resulted in mathematically modeling the diffusion of pollutants over entire urban complexes." This award, along with the Richard Beatty Mellon Award, are the two highest awards that may be presented annually in the Air Pollution Control Field. Dr. Edward R. Weidlein received this award in Buffalo in 1956 and General Richard K. Mellon was the recipient in 1962 in Chicago.

--APCA Release

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711 Annual Meeting, American Institute of Ultrasonics in Medicine.

The American Institute of Ultrasonics in Medicine will hold its annual meeting on November 8 to 9, 1968, in New Orleans. The first day of the meeting will be devoted to tutorial papers on the basic principles of diagnostic ultrasound and a workshop session on applications in echoencephalography, cardiology, ophthalmology, obstetrics, gynecology and abdominal investigations and Doppler studies. The last day will be devoted to terminology on diagnostic ultrasound to be adopted by the A.I.U.M. and on methods to measure the performance of the equipment. Scientific papers are invited on clinical applications and developments in technique and instrumentation. A one-half page abstract including figures should be sent by September 15 to G. Kossoff, Biophysical Research Laboratory, University of Illinois, Urbana, Illinois. These will be published as proceedings of the meeting. The registration fee is \$25.00.

--Can. Med. Assn. J. 99, 33 (July 13, 1968)

712 International Congress on Diseases of the Chest, Washington, D.C., October 4-8.

The Tenth International Congress on Diseases of the Chest will be held in Washington, D.C., October 4-8, 1968. One hundred and forty-four papers on all aspects of cardiovascular and pulmonary diseases will be presented. Some of the highlights will include: Symposia on: Revascularization of the Myocardium; Cardiovascular Surgery; Myocardial Infarction; Sarcoidosis; Tuberculosis; Air Travel and the Cardiorespiratory System; Cine-Angiographic Techniques in Cardiovascular Diseases; Cardiopulmonary Function Testing; Intensive Care Units; Lung Cancer; Mechanical Auxiliary Ventricle; and Emphysema and Chronic Bronchitis. Also included will be luncheon discussions, medical motion pictures, informal scientific conferences, seminars, the Second International Conference on Medical Education, scientific and technical exhibits and the first International Physicians Art Exhibit. Further information and registration forms may be obtained from the American College of Chest Physicians, 112 East Chestnut Street, Chicago, Illinois 60611.

--Can. Med. Assn. J. 99, 28 (July 13, 1968)

713 Congress on Hyperbaric Medicine, Japan, 1969.

The 4th International Congress on Hyperbaric Medicine will be held in Sapporo, Japan, September 2 to 4, 1969. The last congress was held in Durham, North Carolina, in 1965. Further information may be obtained from the secretary, Dr. Koji Ikeda, Fourth International Congress on Hyperbaric Medicine, Department of Thoracic and Cardiovascular Surgery, Sapporo Medical College, South 1, West 16, Sapporo, Japan.

--Can. Med. Assn. J. 98, 43 (June 22 & 29, 1968)

714 Hygienic Guide Series.

The American Industrial Hygiene Association announces the publication of additions to the HYGIENIC GUIDE SERIES - NICKEL CARBONYL, PHOSGENE and ETHANOLAMINES. Hygienic guides contain information relating to the following categories: hygienic standards, toxic properties, industrial hygiene practice, medical information and references. An example of material present in the Phosgene Guide is as follows: "Because the immediate reactions to serious exposures may be negligible, it is important that all exposed personnel be removed from the contaminated area and placed at bed rest under medical observation." One hundred and fifty-seven materials are available in the Hygienic Guide Series. Copies may be purchased from the American Industrial Hygiene Association, 14125 Prevoist, Detroit, Michigan 48227 at 50 cents each. Remittance must accompany orders of five dollars or less. A 20% discount is allowed on orders of 11 to 99 Guides and a 50% discount on orders of 100 or more copies. (Note: The Hygienic Guides are not available from the Industrial Hygiene Foundation).

--Am. Ind. Hyg. Assn. Release, July 22, 1968

COMING EVENTS

- | | | |
|-----|-------------|---|
| 715 | Sept. 1- 6 | American Society of Hematology, New York, N. Y. |
| | Sept. 3- 7 | American Institute of Biological Sciences, Columbus, Ohio. |
| | Sept. 6- 7 | Cardiovascular Symposium (Ninth Annual), Virginia Beach, Virginia |
| | Sept. 7-11 | International Congress of The Transplantation Society (2nd), New York |
| | Sept. 8-13 | American Chemical Society, 156th National Meeting, Atlantic City, N. J. |
| | Sept. 12-13 | Seminar on Safety in the Chemical Industry, University of Illinois, Champaign, Ill. |

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- Sept. 12-13 Society of Cosmetic Chemists. 1968 Seminar on Cosmetic Aerosols.
Boston, Mass.
- Sept. 12-14 Drug, Chemical, and Allied Trades Association. 78th Annual Meeting.
Pocono Manor, Pa.
- Sept. 12-15 American Electroencephalographic Society. San Francisco, Calif.
- Sept. 13-20 American Academy of General Practice. Las Vegas, Nev.
- Sept. 14-19 Institute of Sanitation Management. National Conference and Exposition.
Boston, Mass.
- Sept. 15-20 International Congress on Alcohol and Alcoholism. (28th). Washington, D. C.
- Sept. 16-19 American Hospital Association. Atlantic City, N. J.
- Sept. 19-22 American Medical Writers Association. Washington, D. C.
- Sept. 22-25 American Fracture Association. Houston, Texas.
- Sept. 22-25 National Agricultural Chemicals Association. 35th Annual Meeting.
White Sulphur Springs, W. Va.
- Sept. 22-27 Water Pollution Control Federation, Chicago, Ill.
- Sept. 24-27 ASTM Committee E-19 on Gas Chromatography. Cincinnati, Ohio.
- Sept. 25-26 Health Insurance Council. Denver, Colo.
- Sept. 25-27 American Association of Medical Clinics. New Orleans, La.
- Sept. 25-27 1968 IEEE Ultrasonics Symposium. New York, N. Y.
- Sept. 26-28 Civil Aviation Medical Association (3rd Symposium on Modern Concepts in
Civil Aviation Medicine). San Antonio, Texas.
- Sept. 26-29 Pennsylvania Medical Society. Pittsburgh, Pa.
- Sept. 27-28 American Society of Neuroradiology. New Orleans, La.
- Sept. 30 Society for Pediatric Radiology. New Orleans, La.
- Sept. 30-Oct. 1 AMA Congress on Occupational Health. New York, N. Y.

LEGAL DEVELOPMENTS

- 716 The Physician Patient Privilege in Personal Injury Litigation. A Proposed Reform. (Monograph) 35 pp. (1968). R. O. Wienke and M. W. Hogan. AVAILABLE FROM: The Defense Research Institute, Inc., 1212 W. Wisconsin Avenue, Milwaukee, Wisconsin 53233. PRICE: \$1.00 to DRI members and subscribers.

Adequate pre-trial preparation is one facet of the efficient use of legal effort which would help to eliminate unnecessary and time consuming courtroom inquiries which only slow down the judicial process and contribute to court congestion. Sample legislation is proposed in this monograph. Adoption of this type of legislation could help to expedite the prompt, fair, and just disposition of personal injury claims, by exposing the fraudulent claims and facilitating pre-trial settlement. It could also facilitate effective pre-trial discovery of the personal injury claim, which would help to insure that the attorneys for both sides come to trial adequately prepared.

--Cond. from text

- 717 Proposed Air Quality Control Region.

A proposed National Capital Interstate Air Quality Region was described in the July 31 Federal Register. It includes the District of Columbia, Montgomery and Prince Georges Counties in Maryland, and in Virginia, the Counties of Arlington, Fairfax, Loudoun and Prince William and the cities of Alexandria, Fairfax, and Falls Church. Dr. J. T. Middleton, Commissioner of the National Air Pollution Control Administration, will hold a consultation on the proposed region at 10 a.m., Thursday, August 22, at the Public Health Service's Radiological Health offices, 12720 Twinbrook Parkway, Rockville, Md. The consultation is open to the public; however participation in the proceedings is limited to representatives of the District of Columbia, Maryland, Virginia, and the affected counties and municipalities. Interested parties also have 30 days in which to comment in writing to the National Air Pollution Control Administration on the proposed boundaries. The consultation on the National Capital area will be the first in a series of 32 scheduled over the next 12 months in areas collectively containing about 64 percent of the Nation's urban population. Air quality control regions for the New York, Philadelphia, and Chicago metropolitan areas, in addition to the Washington, D. C., area, are expected to be designated by the end of this summer. Under the Air Quality Act of 1967, as soon as the Federal Government has designated a region, has published a criterion on a pollutant or a combination of pollutants, and has published the related control technology information, the State or States

responsible for the designated region are on notice to develop standards for the region on the pollutants covered by the criterion, and to develop plans for implementing the standards. The Governor or Governors of the affected States have 90 days to signify their intent to set air quality standards, 180 additional days to hold public hearings and adopt standards, and a further 180 days to adopt plans for implementation and enforcement of the standards. The standards and plans for implementation must be submitted to the Department of Health, Education, and Welfare for review and approval. Criteria and technology data for two of the most important types of air pollutants—the sulfur oxides and particulate matter—are scheduled for publication by the National Air Pollution Control Administration later this year.

--Cond. from U. S. Dept. of Health, Education, and Welfare Release, July 31, 1968

BOOKS, PAMPHLETS AND NOTICES

- 718 Current Research in Chronic Airways Obstruction. Ninth Aspen Emphysema Conference. Public Health Service Publication No. 1717, May, 1968. pp. i-x, 1-415. U. S. Department of Health, Education, and Welfare, Public Health Service. AVAILABLE FROM: Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402. PRICE: \$2.00.

Annual Aspen Emphysema Conferences, held every year since 1958, at Aspen, Colorado, have come in recent years to illustrate a broad, multidisciplinary approach to the many scientific and medical problems that are part of the large, complex public health problem—chronic obstructive lung disease. The Ninth Emphysema Conference was concerned with advances and research in the physiology and morphology of the lung, as related to chronic obstructive lung disease. The Table of Contents follows: General Session; Lung Energetics and Lung Disease; Organotypic Culture of Mammalian Lung—Studies on Morphology, Ultrastructure, and Surfactant; The Biochemistry of Lung; Pulmonary Surfactant: Its Depletion and Regeneration in Excised Lungs; Anatomy & Pathology; Electron Microscopy of the Epithelium of Human Bronchus in Epidermoid Carcinoma; Microphysiology of the Lung: Acute Mechanical Effects of Lung Volume Changes on Alveolar Wall Fenestrations; Pressure-Volume Curves of Postmortem Human Lungs Before and After Arsenic-Borax Preservation; Differences in the Lobar Distribution of Emphysema and Chronic Bronchitis in the Lung; Clinical and Morphologic Correlations in Chronic Airway Obstruction; Peribronchiolar Radial Traction, Measured—A Preliminary Report; Physiology; Mechanisms Controlling the Peripheral Circulation of the Lung, With Some Clinical Correlations; Effect of High Hematocrit States on Ventilation at 5,317 Feet; Quantitative Aspects of CO₂ Buffering of Tissues; Exercise and Intrapulmonary Ventilation: Perfusion Relationships in Chronic Obstructive Airway Disease; Distribution of Pulmonary Bloodflow in Chronic Airways Obstruction; Lung Scintiscanning and Pulmonary Arteriography; Lobar Ventilation in Obstructive Syndromes; Pulmonary Artery-to-vein Shunts in Obstructive Pulmonary Disease; Bronchial Mechanics. Specific Compliance of Pulmonary Compartments; The Relationship Between Maximum Inspiratory Pressure and Total Lung Capacity (Coefficient of Retraction) in Normal Patients and in Patients With Emphysema, Asthma, and Diffuse Pulmonary Infiltration; Flow Control During Forced Expiration—A Preliminary Report; Clinical Studies; Clinical and Pathological Correlations in Chronic Airways Obstruction; Prognosis in Chronic Bronchitis; The Prognosis in Chronic Bronchitis; The Bronchial and Emphysematous Types of Chronic Obstructive Lung Disease in London and Chicago; Emphysema and Chronic Bronchitis: Clinical Manifestations and Their Physiological Significance; Bohr Integral Isoleths and Their Use to Study the Diffusing Capacity of the Lung in Obstructive Disease; Applied Research; The Veterans Administration Cooperative Study of Pulmonary Function. 3. Mortality in Relation to Respiratory Function in Chronic Obstructive Pulmonary Disease; Disability Evaluation in Dyspneic Applicants for Social Security Benefits. Submaximal Exercise as a Measure of Physical Working Capacity; Conference Summary.

The 30 papers have been abstracted and will appear in future issues of the Digest. Summarizer, Charles M. Fletcher, who concluded the Conference, said, "We have certainly advanced a long way since the first emphysema conference in our ability to distinguish different syndromes in patients with airways obstruction. The Denver group, starting by delineating two contrasting clinical groups, PP (pink and puffing) and BB (blue and bloated), has shown in elegant detail the contrasting physiological features of the two groups. A survey of a general population of patients with severe airways obstruction has identified contrasting groups which, like the Bellevue group, we call A and B, with a large intermediate mixed group. It has been shown that patients of type A, resembling PP, tend to have much more emphysema than patients of type B, who resemble type BB and may have no emphysema at all. We can now recognize two main types of

advanced disorder: lung destruction and bronchial obstruction. But only in exceptional cases does one or the other predominate so much as to produce a typical PP or A on the one hand or typical BB or B on the other. How much have we learned about the origin and nature of these emphysematous and bronchial changes? I believe we've learned almost nothing about the basic etiology of emphysema. Its relationship to bronchitis is still uncertain. Dr. William M. Thurlbeck reports a clear association between bronchitis and emphysema, but Dr. Daniel E. Jenkins finds no quantitative association between mucous gland hypertrophy and emphysema. If there is an association, it need not be one of cause and effect but could be due to a common factor such as smoking. There may be a group of susceptible subjects who have a particular risk of developing airways obstruction. We have some preliminary evidence that these susceptible patients may have bronchi which are rather more reactive to smoking or other irritants (perhaps air pollution) than other less susceptible subjects. This is a field we should explore with improved and more standardized techniques. Dr. Brinkman's followup did not reveal much evidence of deterioration in ventilatory function; perhaps the susceptible subjects are more readily detectable in England with our higher incidence of bronchitis than in the United States. We certainly need to know more about the early antecedents of the advanced disease types we see in our clinics. The first relatively simple requirement for advance is a better agreement on terminology. Because the bronchitic patients whom the clinician sees have airways obstruction, he assumes that when he talks about bronchitis others will understand that he implies a condition involving the over-production of sputum and airways obstruction. The pathologist sees no airways obstruction but rather mucous gland hyperplasia and cellular infiltration, and this is bronchitis to him. Definitions of the three main forms of chronic bronchitis have been proposed by the British Medical Research Council. While unsatisfactory in some respects, at least they are terminologically exact. The second need is to adjust the balance among the branches of our research tree, pruning back, as I have already suggested, the rather hypertrophied branch of phenomenology in the moribund, and fostering more studies of the earliest departures from abnormality. Ingenious instrumentalists should provide us with more sensitive and discriminatory tests of pulmonary function, devised to be economical in time and space so that they may be used in field surveys, and we should go out into the population of apparently healthy subjects from which our patients come. We need more prospective studies through which by regular and not too infrequent reviews we can pick out these subjects who are beginning to develop abnormalities. Such surveys will not only enable us to determine whether we can classify susceptible individuals to discover what part is played by environmental hazards in advancing progression. Studies of this kind will have as a most important consequence the possibility of designing controlled evaluation of preventive measures. We are doing much too little about the problem of controlling the cigarette habit, which we know does so much harm to so many people. Both in England and the U.S.A., this is hardly regarded as a respectable field for research. It would be most helpful if we could combine studies of populations outside the hospital with epidemiological pathology. What is the distribution by ages in different population groups and in different countries of the morbid anatomical changes of emphysema? To get meaningful answers to this sort of question we will have to establish consistent pathological techniques and assessments. Perhaps material for such studies could be derived from the vast numbers of accidental deaths that afflict our modern society. These could provide some sort of random sample of the general population in different and residential areas. Variation in prevalence might throw further light on environmental etiological agents.

Editor's Note: Interested Digest readers should also refer to the the IHF "Emphysema in Industry Symposium" proceedings: published as IHF Medical Series Bulletin No. 10. A limited number of copies is available to members at \$2.50 (non-members \$5.00). --R. T. P. deT.

- 719 **Occupational Safety and Health.** Hearings Before the Select Subcommittee on Labor of the Committee on Education and Labor House of Representatives, 90th Congress, Second Session on H. R. 14816. Printed for the use of the Committee on Education and Labor. pp. I-XI. 1-990. **AVAILABLE FROM:** Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402. **PRICE:** Not given.

The full text of the Bill appears herein with verbatim transcription of statements given representatives of government (Federal and State), industry, labor and private associations (scientific, professional and technical), supported by written statements, letters and exhibits. An appendix, which includes similar material submitted by individuals and groups who did not appear in person, contains Industrial Hygiene Foundation's written testimony (letter to Congressman E. J. Holland dated March 27, 1968). Of several Industrial Hygiene Foundation publications

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supplied as exhibits, the following appear herein: IHF Legal Series Bulletin No. 5 The Walsh-Healey Public Contracts Act (1963); Industrial Hygiene Foundation (address by the Managing Director read before the 28th Annual Meeting of IHF, 1963).

Editor's Note: See Editorial "National Occupational Health Planning" this issue, p. ii.

--R. T. P. deT

- 720 Radiation Control for Health and Safety Act of 1967. Hearings Before the Committee on Commerce United States Senate, 90th Congress, Second Session on S. 2067, S. 3211, and H. R. 10790 Part 2, May 6, 8, 9, 13, and 15, 1968. Serial No. 90-49. Printed for the use of the Committee on Commerce. pp. I-VII, 409-1596. AVAILABLE FROM: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. PRICE: Not given. See Industrial Hygiene Digest abstract no. 299, April, 1968, for a review of Part I of this hearing.

The text of the bill is given, followed by a statement of the chairman, Senator Bartlett, asking the following questions: "How serious is the problem? What are the diversions of the radiation problem? What are the organizations with a voice in radiation control? How adequate is our present knowledge about effects of ionizing radiation? How can we reduce radiation exposure? How can we get better regulations to reduce exposure to ionizing radiations? Looking ahead, future provision will need to be made for control of microwave and laser radiations." Senator Bartlett said. Betty Furness, Special Assistant to the President for Consumer Affairs, entered a plea for government to improve protection of the public in matters where the individual (consumer) "does not have the technical knowledge or the means to determine or eliminate the dangers for himself." Speaking for the National Center for Radiological Health, Director James G. Terrill indicated that the NCRH does not have "right of entry" to investigate radiation accidents. Investigations would need to be made at the request of state or local health authorities. Nor does the Center for the Public Health Service have authority to initiate corrective regulatory action under the Public Health Service Act, which is limited to prevention of spread of communicable diseases. Under S. 3211 the Department of Health, Education and Welfare would be responsible for administering and enforcing its provisions. According to Director Philip R. Lee, Assistant Secretary (of Health, Education and Welfare) for Health and Scientific Affairs, S. 3211 contains three features, not present in H. R. 10790, which are necessary to insure an effective, equitable and economical program of protection against hazardous radiation from electronic products: 1. Mandatory repair or replacement by the manufacturer to protect the consumer's rights and hasten corrective action. 2. HEW surveillance of industry's testing programs and records to assure compliance with standards (it authorizes on-site visits). 3. Manufacturer's certification to be included in each product subject to a standard, indicating that it has been tested and found in compliance with such. (A permanent label or tag would be required). There is an extensive section including statements, letters, and other materials submitted for the record. A statement by Dr. Ham, Professor and Chairman, Department of Biophysics, Medical College of Virginia (who spoke on lasers at the Foundation's 32nd Annual Meeting) appears on pp. 754-757. A letter from the Industrial Hygiene Foundation (pp. 831-832) calls attention to the paper to be presented by Dr. Zwang at the Foundation's 33rd Annual Meeting which is intended to provide an integrated position regarding laser effects on the human eye which should assist those attempting to develop standards for non-ionizing radiation exposure.

--R. T. P. deT

- 721 Manual of Hazardous Chemical Reactions. NFPA No. 491M. National Fire Protection Association. AVAILABLE FROM: National Fire Protection Association, 60 Batterymarch Street, Boston, Mass. 02110. 256 pp. (1968). PRICE: \$2.50.

The third edition of this work containing more than 300 new entries, has recently been published by the National Fire Protection Association (NFPA). A total of 2,000 reactions documented as potentially dangerous are listed in this manual. Reported either in technical publications or in private communications, reactions range from those which produce incandescence or flames at moderate or slightly elevated temperatures to those that produce explosions or detonations. Arrangement of entries is alphabetical according to the name of one of the reactants, and the same reaction is cross-referenced under the names of the other reactants involved. Each entry includes brief remarks concerning the reaction, plus literature references which are complete enough to lead users of the manual to the source of information. The 1968 edition of the publication has been prepared by the NFPA Committee on Chemicals and Explosives, through its Sectional Committee on Hazardous Chemical Reactions headed by Russell H. Scott of Battelle-Northwest, Richland, Washington.

--Cond. from NFPA Release, June 24, 1968

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INDUSTRIAL MEDICAL PRACTICE

- 722 The Prevalence of Chronic Disease Among Problem Drinkers. S. Pell and C. A. D'Alonzo. Arch. Environmental Health 16, 679-684 (May, 1968).

The subjects of this study were 922 employees of E. I. duPont de Nemours and Company who were known or suspected to be problem drinkers, and an equal number of matched controls drawn from the company population. The two groups were compared with respect to prevalence of various chronic diseases. It was found that although alcoholics may show a higher prevalence of certain diseases than do nonalcoholics, it does not necessarily follow that alcohol itself plays a direct role in their pathogenesis. The associations may arise in the following ways: (1) Nutritional deficiencies or imbalances may lead to pathological changes or reduced resistance to disease. (2) The drinkers may use, in addition to alcohol, excessive amounts of tranquilizers, sedatives, stimulants, tobacco, or other intoxicants which may initiate or aggravate disease processes. (3) Psychiatric problems frequently seen in alcoholics, such as anxiety states and prolonged tension, may lead to psychosomatic disorders and increased susceptibility to a wide range of diseases. (4) A disorderly way of life, characteristic of many drinkers, is likely to be accompanied by neglect of basic health habits. Clinical observations, post mortem studies, and animal experimentation have demonstrated a direct toxic effect of alcohol on the cardiovascular system. In general, investigators have found that the acute effects to be peripheral vasodilation accompanied by coronary vasoconstriction, cardiac arrhythmias, tachycardia, myocardial depression, decreased coronary blood flow, and coronary insufficiency in the presence of atherosclerosis. Irreversible myocardial damage may occur after prolonged excessive consumption of alcohol as a result of biochemical changes which produce alterations in myocardial metabolism. The prevalence of alcoholic cardiomyopathy is unknown, but clinical observations suggest it is small and confined to persons who have been drinking heavily for a long period of time. Autopsy studies indicate that alcohol has no effect on the development of coronary atherosclerosis, but acute alcoholic intoxication, by causing reduced coronary blood flow and coronary vasoconstriction, may lead to a fatal episode of coronary insufficiency in an atherosclerotic heart. Stomach ulcer was almost twice as common among the drinkers than the controls. Duodenal ulcer was also more prevalent among the drinkers, but to a lesser extent. There are 14 references.

--Cond. from text:

- 723 The Alcoholic Needs Hospital Care. M. A. Block. Hospitals 42, 48-51 (May 1, 1968)

Hospitals which admit alcoholics have disproved the notion that they are unusually difficult to treat. Medical schools and hospitals must realize that sick persons suffering from alcoholism cannot be ignored. Their treatment in a hospital is justified and necessary.

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

- 724 Thrombocytopenia and Alcoholism. R. M. Post and Jane F. Desforges. Ann. Internal Med. 68, 1230-1236 (June, 1968).

Eight patients with acute and chronic alcoholism and liver disease, who suffered one or more episodes of acute thrombocytopenic purpura after heavy alcoholic intake, are described. Recovery was rapid after withdrawal from alcohol, and the use of corticosteroids did not appear to alter their course. Folic acid deficiency, splenic pooling of platelets, and massive hemorrhage do not appear to be causal factors. The possible role of excessive coagulation and a direct effect of alcohol on the bone marrow or circulating platelet are discussed. There are 26 references.

--Author's summary

- 725 Ultrastructure of Human Alcoholic Hyalin. E. A. Smuckler. Am. J. Clin. Pathol. 49, 790-797 (June, 1968).

Alcoholic hyalin (Mallory bodies) was studied by histochemistry and electron microscopy in liver biopsies from adults with histories and clinical findings of prolonged alcohol excess. The hyalin masses are meshworks of fibrils not related to other cellular organelles. The fiber did not demonstrate a periodicity, and the width was different than the membranes of the endoplasmic reticulum in the same cell. Histochemical analysis suggest a significant protein content. The masses were frequently observed in cells with structural evidence of cellular activity. The masses are suggested to represent a specific cellular reaction to injury.

--J. Am. Med. Assn. References and reviews

- 726 Knowledge of Public Health Among Medical Students. L. Bergner.
Arch. Environmental Health 16, 715-718 (May, 1968).

One hundred medical students were questioned on knowledge relevant to certain current public health problems before and after full-time participation in research-oriented programs sponsored by three public health agencies. Lack of initial information and a failure to improve this level of knowledge were observed. On most of the questions the number of students who shifted to the correct response on the after questionnaire was equaled by the number who shifted away from the correct answer. The importance of providing information about community health problems were discussed.
--Author's summary

- 727 Transmission of Electrocardiograms From a Community Hospital for Remote Computer Analysis
R. J. Dobrow, et al. Am. J. Cardiol. 21, 687-698 (May, 1968).

The accuracy of computer diagnoses was studied in a group of 400 consecutive electrocardiograms by comparing the computer-generated reports with standard interpretations. This "standard" was attained by physician review of independent sight reading and computer interpretation. Of computer reports, 85% were judged acceptable. Of individual "standard" diagnoses, 87% were correctly identified by computer. No false normal readings were noted, at the expense of some over-reading. Computer electrocardiographic reports are useful as an aid to clinical electrocardiographic reading, reducing physician time for interpretation fivefold. Final physician review is always mandatory prior to use of data in patient care.

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

- 728 Stress Fracture of the Femur: A Work Accident. I. A. Mansoor.
Brit. J. Ind. Med. 25, 154-155 (April, 1968).

Stress fracture was observed in a young building laborer aged 35 whose work entailed the continuous carrying of heavy loads from the ground to upper floors. The nature of his work, the gradually increasing pain, the trivial cause of fracture, plus a fracture with little displacement occurring in a bone of normal texture and density, confirm the diagnosis. The importance lies in the recognition of stress fracture as an occupational hazard.

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

- 729 Role of Environmental Temperature and Humidity in Susceptibility to Disease. Anna M. Baetjer
Arch. Environmental Health 16, 565-570 (April, 1968).

It should be noted that all of the experiments cited in this paper on the role of environmental temperature and vapor pressure as factors which affect susceptibility of the host to disease have been concerned with diseases due to specific exogenous agents. However, there is reason to believe that environmental temperature also may play a role in some diseases of exogenous origin. The results of the few experiments described in this paper demonstrate that environmental temperature and humidity, by altering the physiological functions of the host, may affect susceptibility to endogenous disease-producing agents and thus play a coincident role in such diseases. There are 11 references.

--Author's comment

- 730 Obstetrical Use of the Ultrasonic Doppler Instrument. T. S. Lloyd, Jr.
J. Am. Med. Assn. 204, 1195-1196 (June 24, 1968).

Doppler ultrasonics provides the first positive sign of pregnancy. Fetal cardiovascular activity can usually be detected shortly after the second missed menses. At 11 weeks of pregnancy, fetal life can be proven in 90% of patients, and after 17 weeks, in 100%. The ultrasonic Doppler diagnostic instrument is of great value in threatened abortion, missed abortion, and in amenorrhea in patients with marked obesity or fibroid uteri. It is also valuable in determining fetal position in diagnosing twins, and in finding the placental site. There are 10 references.

--Author's abstract

- 731 Epidemiological Notes on Mycobacterium kansasii Disease. J. S. Chapman, Margaret Dverlv, and Sharon Spohn. Arch. Environmental Health 16, 673-678 (May, 1968).

Extensive investigation of residence, mode of life, income, habits, and use of dairy products has been carried out in 59 patients with pulmonary disease caused by M. kansasii. Men have this disease more frequently than women; the ratio is approximately 2:1. Mean age is 37 years. Ethnic distribution follows that of the total population. Income, mode of life, and occupation are at definitely higher levels than among tuberculous patients in the same two clinics and hospitals. Two residential factors appear: (1) a 75% frequency of rural life in youth, and (2) suburban residence in their present domiciles. Certain evidence, not conclusive, suggests that M. kansasii mycobacteriosis may have been acquired recently and in relation to the present domicile. A strong association with consumption of dairy products was found, both in youth and at the time of illness. This association, however, is not sufficient to prove milk-born infection. There are 14 references.

--Authors' conclusions

- 32 Symptomatic Alveolar Mural Sclerosis. A Case With Forensic Aspects. P. Gross and P. J. Clancy. Arch. Environmental Health 16, 728-733 (May, 1968).
Reprints available from Industrial Hygiene Foundation, 4400 Fifth Ave., Pittsburgh, Pa. 15213

The occupational and medical history of a 42-year-old woodworker and mechanic is reported who suffered from chest pains and shortness of breath of nearly two years' duration. Pulmonary function studies and pulmonary angiograms led to lung biopsy. The lung biopsy revealed the presence of alveolar mural sclerosis and a minimal amount of subpleural anthracotic pigment. Forensic considerations involved the nature and the age of the anthracotic pigment deposits as well as the lack of topological relationship between the pigment and the mural sclerosis. There are 4 references.

--Authors' summary

- 733 Pulmonary Disease Due to Mycobacterium xenopei. W. M. Doyle, L. C. Evander, and H. Gruft. Am. Rev. Resp. Dis. 97, 919-922 (May, 1968).

There is strong presumptive evidence that Mycobacterium xenopei caused pulmonary disease in a 72-year-old patient. The patient demonstrated a clinical picture characterized by cough, dyspnea, fever, and chest pain. Chest x-rays showed infiltration in both lung fields. Unexpectedly, this organism showed susceptibility to erythromycin. Skin tests for fungi were negative. M. xenopei has been isolated in England and France but rarely in the United States.

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

- 734 Tuberculosis Risk in Students of Nursing. I. Levine. Arch. Internal Med. 118, 545-548 (June, 1968)

A review was made of 1,791 students of nursing to determine their tuberculosis risk during the years 1948 through 1964. Conversion to tuberculin positivity at graduation averaged 66% in students entering in 1948 through 1951, 21% in those entering in 1952 through 1958, and 3.5% in those students who entered in 1959 through 1964. The first decline in infection rate was associated with the use of anti-tuberculosis drugs instead of prolonged bed rest care and lung collapse measures. The second decline was associated with the addition of the routine screening chest x-ray of each patient seeking hospital or clinic care. Removal of the residual risk to the student of nursing may depend on more conscientious use of contagious techniques in the care of any patient who coughs.

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

- 735 Drive and Performance of the Ventilatory Apparatus in Chronic Obstructive Lung Disease. R. V. Lourenco and J. M. Miranda. New Engl. J. Med. 279, 53-59 (July 11, 1968).

Mechanical performance of the ventilatory apparatus (lungs and chest wall) and drive from the respiratory center were independently assessed in patients with chronic obstructive lung disease and normal subjects. Performance was abnormal in all the patients but more noticeably in those with hypercapnia. Drive, assessed from changes in the electromyogram of the diaphragm during rebreathing, was abnormally low only in patients with hypercapnia (average arterial blood P_{CO_2} of 61 mmHg); the integrated electromyographic activity increased an average of 1.7 units

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mmHg of arterial-blood P_{CO_2} whereas in other patients and in normal subjects, it increased 24 and 18 units respectively. These results suggest that mechanical alterations of lungs and chest wall have a fundamental role in the buildup of CO_2 retention in chronic obstructive lung disease. However, once hypercapnia appears, decreased respiratory-center drive is also important and becomes predominant with marked CO_2 retention. Mechanical and central factors in the treatment of respiratory failure must be distinguished. There are 23 references. --Authors' abst

- 736 The 30-Year Trend of Leukemia in Olmsted County, Minnesota, 1935 Through 1964. R. A. Kyle, et al. Mayo Clinic Proc. 43, 342-353 (May, 1968).

All cases of leukemia occurring in bona fide residents of Olmsted County, Minnesota, during the years 1935 through 1964 were identified and reviewed. Pathologic materials including peripheral blood smears, bone marrow, and autopsy findings were available for reconfirmation of diagnosis and for personal review in 122 of the 125 cases reported. The incidence rate for males was 1.2 times that for females during the 30-year period. Of the 125 cases, acute lymphocytic leukemia was present in 27 (21%), acute myelocytic leukemia in 41 (33%), erythroleukemia in 1, chronic lymphocytic leukemia in 44 (35%), and chronic myelocytic leukemia in 12 (10%). In contrast to the reported trend in mortality rates in the United States over the past 30 years, the incidence of leukemia by age, sex, and cell type has not changed significantly during this time period in Olmsted County. The overall incidence rates for each decade per 100,000 population was 7.7, 6.8, and 9.0, respectively. Although further studies are indicated, no geographic clustering of leukemia has been noted in this series of investigations. --J. Am. Med. Assn. References and Reviews

- 737 Petit Mal Status in Adults. S. W. Thompson and A. H. Greenhouse. Ann. Internal Med. 68, 1271-1279 (June, 1968).

Petit mal is primarily a childhood disorder and becomes less common in adult life. Petit mal status (spike-wave stupor) is an unusual complication, but one third of cases reported since 1950 have been in young adults, usually under 40 years old. Four adults who had petit mal since childhood are presented. Three of these patients, one of whom was age 61, had discrete episodes of petit mal status, while the fourth had prolonged depression of mental function due to constantly recurring petit mal attacks. These patients were initially thought to be psychotic. The clinical features of these and of previously reported cases of petit mal status are considered; their salient characteristics are emphasized, and the differential diagnosis is discussed. There are 19 references. --Authors' summary

- 738 Thermography of Smoking. J. Gershon-Cohen and J. D. Haberman. Arch. Environmental Health 16, 637-641 (May, 1968).

Thermography brings skin temperature recording into the space age. Instead of "loading" the skin by using contact thermometers, such as thermocouples, and obtaining inaccurate temperature readings or a record of an isolated area, thermographs furnish thermal maps of large areas of skin surface without touching the subject. These maps, or thermograms, are made with various types of apparatus. In one thermograph, thousands of point-to-point temperature readings are detected by a sensitive thermistor bolometer in a two- to four-minute scan and registered on photographic film. In another device, a photoconductive sensor assembles the temperature readings rapidly into a pattern on a television screen. The image can be viewed in seconds and can also be photographed for later analysis. About six thermographs are on the market or are being developed. They offer pictorial representations of skin temperatures whose interpretation opens entirely new fields for the study of abnormalities of peripheral vascular circulation. There are 8 references. --Authors' abst

- 739 Differences in the Effects of Inhalation of Sulfur Dioxide and Cigarette Smoke. Y. W. Cho et al. Arch. Environmental Health 16, 651-655 (May, 1968).

In the anesthetized dog the inhalation of sulfur dioxide caused bronchoconstriction which persisted even after acute and chronic denervation. The basic mechanism responsible for this bronchoconstriction as well as the accompanying bronchial arterial vasodilation are different from those activated during the inhalation of cigarette smoke. There are 3 references. --Authors' abst

- 740 Primary Lung Cancer Under the Age of Forty. J. S. Adamson, Jr. and R. M. Senior
Am. Rev. Resp. Dis. 98, 148 (July, 1968). Abstr. of paper presented at annual meeting of
American Thoracic Soc., May 19-22, 1968.

Of the 653 patients with primary lung cancer seen at Walter Reed General Hospital between 1950 and 1966, 92 (14 per cent) were younger than 40 when the diagnosis was established. The writers have analyzed retrospectively the clinical characteristics and natural history of lung cancer in these 92 patients. Complete clinical and follow-up information was available for each patient. General features of the patients were as follows: the median age was 36 (range 21-39); 7 patients were less than 30; 85 per cent were males; 8 per cent of males and 9 per cent of females were Negro. Of the 80 patients (87 per cent) in whom smoking history could be determined, all but 3 smoked cigarettes regularly, beginning at a median age of 17 (range 6-25). In 60 (65 per cent) patients the tumor was in the upper lobes with the right upper lobe dominating approximately 3:2. The lower lobes and the right middle lobe accounted for 15 tumors (16 per cent). A main stem bronchus was the involved site in 13 (14 per cent). The cell type was adenocarcinoma in 38 (41 per cent), undifferentiated in 23 (25 per cent), squamous in 17 (18 per cent), small cell in 9 (10 per cent), and other in 5 (5 per cent). There was no relationship between cell type and patient age. Forty-nine (53 per cent) patients were considered operable; however, the tumor was definitively resectable in only 9, and 2 of these 9 are living. Eighty-three (90 per cent) patients are dead from lung cancer. Their median survival was nine months (range 2-38) from clinical onset of disease. Fifty-four (59 per cent) were dead within 12 months from the appearance of symptoms, and 67 (73 per cent) died within the first year after tissue diagnosis. Four patients are alive and free of symptoms five years after diagnosis; 2 of them had had solitary pulmonary nodules. When classified into clinical stages (Feinstein, Ann. Int. Med., 1964, 61, 27), the survival of the patients at the completion of the study was as follows: 1/12 stage I, 3/5 stage II, 3/20 stage III, and 1/55 stages IV and V. This study emphasizes that primary lung cancer is not rare in young adults, and that the likelihood of prolonged survival is poor regardless of cell type.

--Authors' abstr.

- 741 The Risk of Lung Cancer in Older Men. W. Weiss, Katharine R. Boucot, and D. A. Cooper
Am. Rev. Resp. Dis. 98, 149 (July, 1968). Abstr. of paper presented at annual meeting of
American Thoracic Soc., May 19-22, 1968.

The Philadelphia Pulmonary Neoplasm Research Project, a prospective investigation of 6,137 male volunteers over the age of 45, was begun in December 1951, to study the natural history of lung cancer. Semiannually, over ten years, weight and smoking histories were recorded, 70 mm chest photofluorograms were taken, and questionnaires on respiratory symptoms were filled out. Information on hospitalizations, deaths, and autopsies was obtained routinely. Sixty-eight men had roentgenographic evidence of histologically proved lung cancer on their initial visits. Among the remaining 6,069 men, 93 developed proved lung cancer over the next ten years. To evaluate certain risk factors, the ten-year incidence may be related to selected characteristics of the men on entry into the Project. Despite the higher prevalence of lung cancer on entry among self- and physician-referrals, the risk of developing new lung cancer was unrelated to the source of referral. The ten-year incidence was 1.0 per cent in men who were 45-54 years of age on entry, rose to 2.6 per cent in those who were 55-64, and fell to 0.9 per cent in men 65 and older. Race was also a factor: the ten-year incidence was 3.7 per cent in nonwhites and only 1.3 per cent in whites ($P < 0.001$). If one or more symptoms (chronic cough, worsening cough, hemoptysis, unilateral wheeze, weight loss of more than ten pounds) were reported on entry, the incidence of lung cancer was twice as high (2.2 per cent) as for asymptomatic men. Those with chronic or worsening cough were at highest risk among symptomatic men. The risk was also increased among those with any recognized roentgenographic abnormality. The most important risk factor was cigarette smoking: Those men who had smoked more than a pack a day for more than 40 years had a 5.7 per cent ten-year incidence of cancer. Not a single case of cancer developed among 805 men who never smoked.

--Authors' abstr.

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- 742 Long-Term Chemotherapy for Cancer of the Lung. J. M. Anderson and J. Hutchinson. Diseases of Chest 53, 551-559 (May, 1968).

A clinical trial has been designed to compare two treatments for inoperable squamous cell cancer of the lung. One treatment group receives nitrogen mustard, and the other receives a constant infusion of anti-metabolites by a portable clockwork pump for many months. Current results include periods of apparent growth control of up to eight months.

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

- 743 Survival of Men With Peripheral Lung Cancer in Relation to Histologic Characteristics and Growth Rate. W. Weiss, Katharine R. Boucot, and D. A. Cooper. Am. Rev. Resp. Dis. 98, 75-86 (July, 1968).

The tumor growth rate as measured in 19 men with proved bronchogenic carcinoma presenting as peripheral circumscribed nodules or masses was a major factor in survival calculated from the time the cancer was 1 cm in diameter. Histologic sections were available for the primary tumors in 17 cases and for metastases in the other 2. The more rapid the growth, the more frequent was necrosis and the higher the mitotic frequency. The growth rate of some pulmonary metastases in 2 patients was more rapid than that of the primary carcinoma. Metastases sometimes showed higher mitotic frequencies than the primary tumors in the same patients. The cell types of rapidly growing neoplasms were likely to be squamous or undifferentiated whereas slowly growing tumors were usually adenocarcinomas. When survival is measured from the same point on the growth curve, there is a fairly close relationship to growth rate and to histologic characteristics. There are 23 references.

--Authors' summary

- 744 Pigeon Breeders' Disease. A Clinical Study of a Hypersensitivity Pneumonitis. J. N. Fink, et al. Ann. Internal Med. 68, 1205-1219 (June, 1968).

The clinical and laboratory features of 12 patients with pigeon breeders' disease were studied during symptomatic and asymptomatic phases. The results indicated that this hypersensitivity pneumonitis may occur as an acute, subacute, or chronic form differing in type and intensity of signs, symptoms, and response to therapy. Pulmonary function tests in most symptomatic breeders revealed restriction, obstruction, or a diffusion defect. More than one half of the breeders had chest X-ray findings suggestive of a diffuse interstitial process with secondary alveolar involvement. Lung biopsy showed a granulomatous interstitial pneumonitis and, in the one case of the chronic form, an obstructive bronchiolitis. An Arthus type of skin reactivity to challenge with pigeon antigens was found in all patients. Sera from all 12 breeders contained precipitating antibody against various pigeon antigens. Our experience indicates that the preferential therapy for these patients is avoidance of contact with pigeons. There are 37 references.

--Authors' summary

- 745 Cat-Associated Tularemia. D. W. Dreesen, J. E. McCroan, and S. S. Kalter. Morbidity and Mortality Weekly Rept. 17, 243 (June 29, 1968).

On April 19, 1968, a 39-year-old woman, residing in northwestern Georgia, was severely bitten and clawed on her left hand by her cat. On April 24, she noted chills and a fever of 104°F and the following day she developed painful left axillary lymphadenopathy. She was admitted to the hospital on April 26 at which time a large draining purulent wound was observed on her left thumb, and coexisting pneumonitis was diagnosed. The patient was treated with penicillin, erythromycin, and tetracycline, and gradually improved over the next 4 weeks. Agglutination titers against Francisella tularensis rose from less than 1:8 on April 27 to 1:320 on May 28. Sera collected on May 17 and May 28 were non-reactive when tested against Psittacosis-Lymphogranuloma Venereum antigen, and skin tests performed on June 7 using cat-scratch fever antigen were also negative. The patient gave no history of tick bites. The cat may have acquired the infection from ticks or by feeding on a tularemia-diseased carcass; however, it remained well.

--National Communicable Disease Center, Atlanta, Georgia

- 746 On the Pathology of Pulmonary Emphysema. W. Hartung.
Beitr. Klin. Tuberk. 122, 225-236 (1966). German.

The pathogenetic classification of pulmonary emphysema is based upon both morphological examination and histomechanical measurements on isolated autopsy lungs. Some newer results of post mortem functional analysis are presented. The senile changes within the lung are caused by a decrease of tissue elasticity. On the basis of morphology they may be defined as primary diffuse atrophic emphysema, which usually is of minor clinical importance. All secondary emphysemata are dominated by the lesions resulting from previous diseases of the lung structures, bronchi, or thorax. They represent different morphological and functional patterns. The functional data from histomechanical tests can be compared directly with the results of clinical function tests. The bronchostenotic, morphologically often bullous, emphysema in combination with chronic bronchitis and bronchiolitis will be found in most of the cases of clinically important obstructive emphysema, while in generalized scarring emphysema a combination of obstructive and restrictive functional disorders is predominant. Distension emphysema differs from diffuse atrophic (primary) emphysema only functionally—in the disturbed size ratio of lung to thorax.

--APCA abstr

- 747 The Course of Chronic Obstructive Lung Disease. R. H. Earle and B. Burrows.
Am. Rev. Resp. Dis. 98, 152 (July, 1968). Abstr. of paper presented at annual meeting of American Thoracic Soc., May 19-22, 1968.

In 1960, a prospective study of patients with irreversible airways obstruction of uncertain etiology (the emphysema-bronchitis syndrome) was begun at the University of Chicago Hospitals. Two hundred patients were enrolled in a special clinic and have been followed at regular intervals using standardized methods of study and employing digital computer facilities for data storage and analysis. More than 200 initial characteristics have been related to subsequent mortality, and progression of each characteristic has been determined from follow-up examinations. Most patients show progressive worsening in all features except cough and sputum. The mean decline in FEV₁ was 48 ml per year in surviving patients, and data suggest that the true decline is closer to 80 ml per year, patients with rapid deterioration being lost more often because of death. These rates of decline are quite similar to those observed in subjects whose milder subclinical disease has been discovered in epidemiologic surveys.

--Authors' abstr. cond.

- 748 The Occurrence and Incidence of Emphysematous Lesions in Man From 15 to 44 Years of Age. J. Kleinerman, C. R. Cowdrey, and Helene M. Stein. Am. Rev. Resp. Dis. 98, 152 (July, 1968). Abstr. of paper presented at annual meeting of American Thoracic Soc., May 19-22, 1968.

Little is known of the onset and incidence of the early or subclinical lesion of emphysema or of the biologic progression of this disease. Many of the pathologic features of the emphysematous lesions are compatible with one of two hypotheses: (1) The lesions occur acutely at a single episode adjacent in time to the onset of clinical symptoms, in the fourth or fifth decade; or (2) the lesions occur by silent progression in stages from early childhood until sufficient destruction is accomplished to produce symptoms. In order to test these hypotheses, lungs of persons who died acutely by accident or trauma were collected. From 15 to 18 lungs in each five-year span from ages 15 to 44 years were included; these totaled 101 lungs. Lungs were fixed by formalin fume, sliced, described grossly, and photographed. Thick and multiple thin sections were studied. Varying amounts of pigmentation were present in the hilar lymph nodes and pleura in all cases; in the parenchyma in most cases, even in the youngest group (15 to 19 years). The intensity and extent of pigmentation appeared to increase with age. This is considered more an index of environmental exposures than of age alone. Centrilobular types of lesion occurred in minimal degree in 23 per cent of the youngest group (15 to 19), were present in 60 per cent of lungs in the 20- to 24-year-old group, and varied between 45 per cent to 65 per cent in successive age groups. Panlobular lesions were present in 6 per cent of the 15- to 19-year-old group, increased to more than 55 per cent in the 30- to 34-year-old group, and decreased to approximately 25 per cent in groups of those more than 34 years of age. Respiratory bronchiolitis was seen in 70 per cent to 90 per cent of all age groups. These observations indicate that in a supposedly nondiseased population anatomic lesions of emphysema may be seen in a considerable number of lungs as early as 15 to 19 years of age and appear to increase in incidence with age and environmental exposure.

--Authors' abstr.

- 749 An Outbreak of Food Poisoning at a Residential Summer Camp. H. S. Barrett.
Conn. Health Bull. 82, 143-151 (June, 1968).

An outbreak of staphylococcal food poisoning in a residential summer camp has been described. One out of three individuals became dramatically ill with characteristic symptoms of chills, collapse, nausea, vomiting and diarrhea approximately three to four hours after eating. The epidemiological information indicated infected chicken salad. Laboratory confirmation of this finding was obtained. Improper food handling practices resulting in incubation due to inadequate refrigeration were identified. A surprising amount of nose and throat infection was uncovered in the food handlers including the organism identified from the food. This kind of outbreak, while not serious in its final effects needs careful epidemiological and laboratory investigation to identify the source of infection and the reasons for its occurrence. Careful instruction in fundamental food handling practices is the key to prevention.

--Author's summary

SKIN DISEASES AND BURNS

- 750 The Effect of Arsenic on Pyoderma. O. J. Stone and Carolyn J. Willis.
Arch. Environmental Health 16, 490-491 (April, 1968).

Contact with arsenicals is known to induce pyoderma. The authors have shown that the amount of arsenicals that will not produce lesions on normal skin will markedly increase the severity of a quantitated, induced, bacterial infection.

--Authors' summary

CHEMICAL HAZARDS

- 751 Potential Health Hazards of Materials Used by Artists and Sculptors. J. T. Siedlecki.
J. Am. Med. Assn. 204, 1176-1180 (June 24, 1968).

The painter or sculptor should know his materials and use them intelligently. He should realize that each material has its own nature and properties, its own qualities and limitations. He also should understand that almost any material can be handled safely without adverse effect on his health and well-being by simply following a few precautionary measures. There are 10 references.

--Author's conclusion

- 752 Husbandry Versus Fluoride Ingestion as Factors in Unsatisfactory Dairy Cow Performance.
E. W. Crampton. J. Air Poll. Control Assn. 18, 229-234 (April, 1968).

1. There is dental fluorosis among the cows of all herds included in this study but none of sufficient severity to be indicative of systemic fluorosis toxicosis. This is confirmed by the findings in tail vertebrae biopsy. 2. An appreciable portion of the fluoride ingested has originated from the commercially prepared "balanced" dairy cow rations fed. Farmers might to their advantage be advised of this situation. 3. Roughage quality per se was unacceptable more because of its advanced maturity than because of its fluoride contamination, which was about 17 ppm. This level of forage fluoride may, however, become of significance when the meal mixtures fed with it are also significant sources of fluoride. 4. Over-all allowances of feed are too meagre to sustain acceptable levels of production of breeding cows, and the feeding practice does not follow recommended differential treatment of cows of differing performance. 5. Cattle in general are of nondescript blood lines, and the absence of herd performance records precludes use of effective programs for improvement through both selective mating and culling. There are 7 references.

--Author's conclusions

- 753 Effect of Fluoride Treatment in a Patient With Osteoporosis. Jenifer Jowsey and P. J. Kelly.
Mayo Clinic Proc. 43, 435-443 (June, 1968).

The occurrence of osteosclerosis as a consequence of fluoride intake has been reported too often for this element not to have been considered for use in the treatment of conditions characterized by loss of bone. Persons living in high-fluoride areas in India have been found

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to have increased bone density by roentgenologic study. Cattle fed fluoride develop thick bone cortices, and new bone formation can be demonstrated; in these animals, and in rabbits, an increase in serum alkaline phosphatase activity has been reported, which has been interpreted to indicate increased bone breakdown or an alteration in the mineralization of new bone. That there may be an effect of fluoride on the process of mineralization is suggested by studies on young pigs in which a defect in growth and a failure of mineralization were demonstrated. Other studies on rats suggest that an osteoclerotic condition similar to that in the fluorotic persons in India may be more common. In the totally fluoride-laden skeleton of the person from a region with high natural fluoride content of the water, the picture appears to be that of early mild rickets followed by osteosclerosis in the adult. On the other hand, in adult patients with osteoporosis and multiple myeloma who are treated with fluoride, the skeleton subsequently contains small volumes of bone tissue labeled with the fluoride. In the first instance, resorption of bone is apparently reduced, while, in the second, new bone formation is stimulated. While treatment of osteoporosis with fluoride should be considered to be at an investigative stage, the case reported here, in combination with a previous report of three cases, suggests that it may be a useful therapeutic agent. The effect appears to be the correction of an established abnormality—the porosity of the bone—rather than prevention of the disease. There is no doubt that osteoporosis will continue to be a problem in medical practice, and that treatment rather than prevention will be the more practical approach to osteoporosis. Fluoride has been reported to have adverse effects at high doses, and care must be exercised if this element is to be used successfully in the treatment of osteoporosis. There are 25 references. --Cond. from text

- 754 The Prevalence of Chronic Obstructive Airway in Chlorine Gas Workers. F. D. Krause, E. H. Chester, and D. G. Gillespie. *Am. Rev. Resp. Dis.* 98, 150 (July, 1968). Abstr. of paper presented at annual meeting of American Thoracic Soc., May 19-22, 1968.

The relationship between chronic chlorine gas inhalation and obstructive pulmonary disease was studied, using all the personnel at risk of a chlorine gas plant. One hundred and thirty-nine workers were evaluated by physical examination, chest roentgenogram, respiratory questionnaire, and ventilatory studies, including forced expiratory volume (FEV), maximal midexpiratory flow (MMF), and maximal breathing capacity (MBC). Continuous air sampling of chlorine plants has demonstrated that 99 per cent of the samples contain less than 1 part per million of chlorine. Accidental additional exposure that was severe enough to require oxygen therapy occurred in 55 workers. One subject had been exposed the day prior to, and another on the day of this study. The average age of these subjects was 37. Only three workers were impaired beyond two standard deviations from normal ventilatory studies. The questionnaire was weighted so that a maximum of 22 points was possible with progressing severity of cough and sputum. None of the impaired subjects had more than 7 such points; conversely, none of the 17 subjects with more than 10 points was impaired. The worker studied 24 hours after acute exposure had normal ventilatory function, and the subject exposed on the same day had a moderate obstructive defect which cleared 24 hours later. Conclusions are that the questionnaire was a poor guide to impaired subjects, that acute chlorine exposure can cause an acute reversible obstructive defect, and that smoking and remote acute chlorine exposure are significantly related to diminished MMF in this group. --Authors' abstr. cond.

- 755 Evaluation of Pulmonary Function Three Years After Acute Exposure to Chlorine Gas. H. Weill, et al. *Am. Rev. Resp. Dis.* 98, 151 (July, 1968). Abstr. of paper presented at annual meeting of American Thoracic Soc., May 19-22, 1968.

Derailment of a freight train near a small Louisiana community in 1961 caused puncture of a tank car and the escape of 6,000 gallons of liquid chlorine. One hundred persons were treated for intense exposure, 17 were hospitalized, and there was one death. Severe dyspnea, cough, bloody sputum, fever, conjunctivitis, nausea, and vomiting were associated with the physical and roentgenographic signs of pulmonary edema. In the surviving patients, significant clinical improvement occurred by the end of two weeks. The purpose of this study was to detect the presence of any significant residual pulmonary functional impairment after a heavy acute exposure to chlorine gas. Five asymptomatic adults were studied three and one-half years after the accident. In 4, pulmonary edema had required hospitalization; the fifth was the spouse of one of the above and had prominent symptoms after the same exposure. Lung volume compartments were essentially normal in all 5 subjects. Mild obstruction to air flow was found in 3, 2 being

heavy cigarette smokers. Arterial blood gas analysis was performed in 4 subjects: 3 had normal oxygen tensions (PO_2) and three, normal PCO_2 . In the one subject with ventilatory maldistribution and mild airways obstruction (smoker), resting PO_2 was slightly reduced with increase to normal after exercise. In the individual with a slightly elevated resting PCO_2 , this value returned to normal during exercise. Pulmonary diffusing capacity (D_L) was measured in the 4 subjects who were hospitalized with pulmonary edema. In 3, D_L was normal; in the fourth it was 72 per cent of predicted. These data indicate that irreversible pulmonary functional abnormalities related to the toxic effect of the gas did not occur in this group.

--Authors' abstr

- 756 The Formation of Nitrous Fumes in Gas Flames. J. H. C. van Mourik.
Ann. Occ. Hyg. (London) 10, 305-315 (October, 1967).

When a mixture of gas and air is burned, only small quantities of NO and NO_2 are formed. If extra oxygen is supplied, the production of NO increases rapidly. The changeover from coke oven gas to natural gas in the Netherlands was accompanied by a considerable increase in the level of nitrous oxides in spaces where gas flames are used, especially in glass-blowing shops. Data on the burning of gas/air and gas/oxygen flames is tabulated. The main cause of NO production is linked to the different flame characteristic of natural gas so that one is inclined to add too much oxygen to a natural gas flame, leading to the production of NO which far exceeds the permissible concentration. A better ventilatory or exhaust system is then needed. In practice, an emergency exposure limit of 63 mg/m³ of NO_2 for 5 min is recommended.

--APCA abstrs.

- 757 Influence of Ozone on Pulmonary Cells. D. L. Coffin et al.
Arch. Environmental Health 16, 633-636 (May, 1968).

Exposure to ozone produces in rabbits an influx of heterophilic leukocytes and a diminution of pulmonary alveolar macrophages obtained by pulmonary lavage. This phenomenon is dose related. It is evident immediately after three hours' exposure, peaks about six hours later, and is still present, but at a greatly reduced level, at 24 hours. This change offers a highly useful parameter that indicates injury from ozone at less than 1 ppm for three hours in rabbits. It is more sensitive, quantifiable, and reproducible than the review of tissue sections. In vivo phagocytic properties of the pulmonary alveolar macrophages are impaired by exposure to ozone at concentrations of 0.3 ppm/3 hrs. and higher, which may play a role in the increased survival time of bacteria in the lungs of ozone exposed animals. There are 16 references.

--Authors' summary

- 758 The Effect of Ozone on Mouse Blood in Vivo. B. D. Goldstein et al.
Arch. Environmental Health 16, 648-650 (May, 1968).

Markedly reduced levels of acetylcholinesterase were found in the erythrocytes of mice exposed in vivo to 8 parts per million ozone for four hours. A lesser reduction in glutathione levels was not statistically significant. This tends to support the hypothesis that the red cell membrane may be more sensitive to the effects of ozone than the intracellular constituents and would also support the possible role of lipid peroxidation in the mechanism of ozone toxicity. There are 14 references.

--Authors' summary

- 759 The Effect of Various Aerosols on the Response of Guinea Pigs to Sulfur Dioxide.
Mary O. Arndur and D. Underhill. Arch. Environmental Health 16, 460-468 (April, 1968).

Further studies of the effects of various soluble and insoluble aerosols on the respiratory response of guinea pigs to sulfur dioxide have been presented. The aerosols discussed are sodium, potassium, and manganous chlorides, ammonium thiocyanate, ferrous sulfate, sodium orthovanadate, activated and spectrographic carbon, manganese dioxide, iron oxide fume, open hearth dust, fly ash, and triphenyl phosphate. All these aerosols when given alone produced no alteration in pulmonary flow resistance. From the point of view of air pollution toxicology, none would be classed as pulmonary irritants. Ferric sulfate, however, was irritant. In

ability to potentiate the response to sulfur dioxide, sodium chloride, potassium chloride, and ammonium thiocyanate ranked in that order. This is also the order in which they would rank based on the data available in the literature on solubility of sulfur dioxide in solutions of their salts. Soluble salts of manganese, ferrous iron, and vanadium, known to catalyze the oxidation of sulfur dioxide to sulfuric acid, potentiated the response to sulfur dioxide. This potentiation occurred more rapidly and at much lower concentrations of aerosol than with sodium chloride. The insoluble aerosols used were completely ineffective in potentiating the response to sulfur dioxide. Detailed post-exposure data obtained with sodium chloride as the aerosol suggest that the biological response results from the formation of an irritant aerosol. It is plain from data presented in this paper that all aerosols do not potentiate the response to sulfur dioxide. It appears from the data at hand that both solubility of sulfur dioxide in a droplet and oxidation to sulfuric acid play a major role in the observed potentiation of the response to sulfur dioxide by certain aerosols. Vituperative arguments on the subject of the importance and interpretation of the well-known disasters of the Meuse Valley, Donora, and London seem to be in vogue. All these episodes have in common three factors: cold temperatures (which would increase the solubility of irritant gases in liquids), fog (which would provide droplets), temperature inversion (which would produce a stagnant air mass with increased concentration of all pollutants and time for chemical reactions). No laboratory experiments done anywhere will "prove" one way or another the "cause" of these episodes. The experiments presented here certainly do not do so. They do lend support to speculations such as those of Stokinger.* They also indicate that the key to the role of sulfur dioxide in air pollution toxicology lies not in the gas itself but in its atmospheric chemistry. There are 23 references.

--Authors' summary

*Stokinger, H. E.: Toxicologic Perspective in Planning Air Pollution Studies, Amer. J. Pub. Health 43, 742, 1953.

- 760 Extraction of Beryllium From Power Plant Waste Material. V. Jirele. Chem. Prumysl (Prague) 17, 175-179 (April 4, 1967). Czech.

Soft coal from the Sokolov region of Czechoslovakia contains a considerable amount of beryllium which passes into the slag and fly ash when the coal is utilized in electric power plants. Significant amounts of toxic beryllium compounds are thus discharged into the atmosphere. The present study was made to investigate a process for the recovery of beryllium from slag or fly ash. Slag containing 800 gBe/t and fly ash from an electrostatic filter containing 787 gBe/t were used for the experiments. Dissolution of Be was tested at 25-100°C with HCl, NaOH, H₂SO₄, and HF. The latter two acids were found most effective. Slags obtained at different combustion temperatures were also tested. The use of fluoride fluxing agents was found to facilitate dissolution of the Be compounds. Separation from acidic solution was tested with solutions of di-(2-ethylhexyl) phosphoric acid (EHPA). The recommended process uses conc. H₂SO₄ at elevated temperatures and extraction in three stages with 0.1M EHPA in kerosene at a pH of 2.2, resulting in complete transfer of beryllium into the organic phase. In the presence of high aluminum concentrations a pH of 1.8 is recommended to suppress extraction of aluminum.

--APCA Abstr

- 761 Study on the Androgen Function of Men Exposed to Cadmium. A. Favino, et al. Med. lavoro 59, 105-110 (February, 1968). (English).

Basal urinary excretion 17 Ketosteroids, Androsterone, Etiocholanolone, Testosterone and Epitesterone was determined in 10 workers of a cadmium alkaline storage battery plant and in 10 workers selected from other jobs in the same factory, matching age and body weight between the two groups. The length of exposure of the workers to cadmium vapours and powder ranged between 2 and 6 years, some of the workers being actively employed in cadmium handling at the time of the investigation and some being engaged in different jobs after symptoms of cadmium danger such as nose ulcers and anosmia had developed. No significative difference in the daily excretion of 17 Ketosteroids, Androsterone, Etiocholanolone, Testosterone and Epitesterone could be detected between controls and cadmium workers, some of whom showed excretions of measurable amounts of cadmium in the urine. In an individual case there was a 38-year-old man with symptoms of impotence and without children after starting work with cadmium, the Androgen excretion was found to be considerably decreased.

--Authors' summary

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- 762 A Review of the Toxicity and Metabolism of Mercury and its Compounds J. R. Brown and M. V. Kulkarni. *Med. Ser. J. (Can.)*, 23, 786-808 (May, 1967).

Mercury poisoning is most frequently brought about by inhalation of mercury vapors. It is usually confined to industry, but cases such as the death of two female stenographers in a warehouse in Alberta, where diethyl mercury phosphate was stored, have been reported. The frequency of positive cases of mercurialism tends to increase with increase in duration and intensity of exposure, especially when exposure is to high concentrations in the air. This appears to be statistically significant for large groups of individuals, but does not apply to single cases. Several cases of mercurialism were found in individuals who had been exposed for 7 years or longer to concentrations of mercury in air less than the M.A.C. of 0.1 mg/m^3 . In general the excretion of mercury in the urine is directly related to the concentration of mercury in the air and the degree of exposure. There is a lack of correlation between urinary mercury and clinical manifestations of poisoning. Similar observations were made on mercury concentrations in the blood. When mercury is absorbed or inhaled as an inorganic or phenyl compound, it leaves the blood in a matter of hours and much of it is promptly excreted in the urine. This is not true of the alkylmercurials, which are highly toxic. D. penicillamine and BAL (2, 3-dimercaptopropanol) have been used in the treatment of mercury poisoning. However, BAL is the effective drug of choice. --APCA absts.

- 763 The Protective Action of Glutamic Acid in Experimental Mercury Poisoning. D. Winter et al. *Arch. Environmental Health* 16, 626-632 (May, 1968).

Administration of glutamic acid salts alone or associated with other products offers protection against acute mercury poisoning in the rat. Protection is manifested by diminution or prevention of oliguria, azotemia, intestinal ulceration, necrotic renal lesions, and by increase in the number of survivals. The possibility that the protective effect could be due to formation in the organism of a glutamomercurial chelated compound is discussed. There are 17 references.

--Authors' summary

- 764 Thallium Poisoning. J. Mathews and A. Anzarut. *Can. Med. Assn. J.* 99, 72-75 (July 13, 1968)

Thallium, a heavy metal, has been used mainly as a depilatory agent in favus and ringworm of the scalp, but its therapeutic use has been discontinued because of its toxicity. It is still available commercially as a rodenticide, as an insecticide and in cosmetic depilatory preparations. Thallium poisoning in humans has been reported from many parts of the world, including the United States. In Canada, during the years 1958 to 1964, an average of 13 cases a year has been reported to the Poison Control Centers. Diagnosis of this condition may be missed, especially in children without an obvious history of thallium ingestion, unless a high index of suspicion is maintained. The authors present a case of a 19-month-old white girl who was poisoned while playing with an open container of "Tat Ant Trap" which contains 1% thallium sulfate. There is no unanimous agreement on the treatment of thallium poisoning. The authors' patient showed dramatic improvement in her clinical condition within 48 hours of treatment with a diphenylthiocarbazon (Dithizone). The authors believe that there should be legislation in Canada restricting the use of thallium sulfate in household products. The following is a list of some of the household products available commercially in Canada that contain thallium sulfate: Antcheck Ant Trap, Antrol Ant Trap, Ant-X Ant Trap, Black Flag Ant Traps, Beacon Ant Killer, Tant Ant Poison, Tat Ant Trap Insecticide, Havok Ant-Trap, Noxall Ant Trap, Tat Roach Trap. There are 21 references. --Cond. from text

- 765 Hard Metal Disease in Workers Employed in Production of Tungsten Carbides (Hard Metals) M. Barborik. *Pracovni lekarstvi (Prague)* 18, (6-7), 241-247 (1966). Czech.

A preliminary report on the health of 193 hard metals workers (104 men and 89 women) is presented. Cough was reported by 90 (47%; 63 women and 27 men) of the exposed workers and was generally of a "barking" nature, suggesting whooping cough. Dyspnea was reported by 317 of the exposed workers and 13% evinced some degree of ventilatory disorder. In 31 cases (16%), marked changes, including fibrosis, were found upon x-ray examination of the lungs. The symptomatology was severe in 3 cases and one patient died of respiratory and cardiac insufficiency.

At autopsy, lung fibrosis was found, as well as a higher level of Co in the hilus nodules and lungs (compared to the controls), even though this patient had been removed from exposure for some years. Co dust is deemed to be of substantial significance in the etiology of hard metal disease and its effect can be caused by tungsten carbide. On the basis of the above findings, hard metal disease was added to the list of occupational diseases for 1964 in Czechoslovakia.

--APCA absts.

- 766 Environmental Health Research: Lead as an Atmospheric Contaminant. Progress Report. M. R. Plancey. *Med. Bull. (Std. Oil N.J.)* 27, 270-279 (Nov. 1967).

In order to reassure the public, government, and itself that the use of lead anti-knock compounds in gasoline is not a public health hazard, the American Petroleum Institute has provided support for several projects. The Tri-City Study, completed in 1965, showed that the levels of atmospheric Pb in Los Angeles, Cincinnati, and Philadelphia were all very low with no upward trend in 5 years, and that the levels of Pb in blood and urine from some 2300 people were well within safe limits. The objectives and general experimental designs of the following projects sponsored at present are provided: (1) research to determine the lowest level of atmospheric Pb that will produce a measurable change in human blood Pb levels; (2) research to evaluate the potential toxicity and carcinogenicity of Pb for animal subjects; (3) study of the Pb burdens of laboratory animals previously exposed to heavy concentrations of automotive emissions and comparison with those of controls; and (4) determination of Pb concentrations in soil and vegetation at known distances from heavily-traveled highways. The only apparently compound-induced effect demonstrated so far is an indication of central nervous systems stimulation in rats after 6 months of oral Pb administration. In the highway studies, higher atmospheric Pb levels are found on the acceleration side of traffic lights, compared with areas where cars run at a steady rate. In a sampling of plants, grass, and leaves near highways, Pb levels decline rapidly beyond 75 ft. from the highway.

--APCA absts.

- 767 Large Lymphocytes in the Peripheral Blood in Cases of Saturnism. L. Ambrosi, F. Vimercati, and C. Di Nunno. *Med. lavoro* 59, 125-135 (Feb. 1968). (Italian).

High percentages of large lymphocytes were found in the peripheral blood of 20 patients with saturnism. These cells, stained by the method of Unna-Pappenheim, showed an intense cytoplasmic basophilia. In the peripheral blood of 20 subjects not exposed to lead, the percentage of large lymphocytes was within normal limits. The results are discussed on the basis of bibliographic data on the significance of the large lymphocytes and of changes of Coombs' test in saturnism. The usefulness of the determination of large lymphocytes in saturnism is stressed.

--English summary

- 768 Withdrawal Symptoms in Workers Exposed to Nitroglycerine. R. P. Lund, J. Haggendal, and G. Johnson. *Brit. J. Ind. Med.* 25, 136-138 (April, 1968).

During the last years several reports have dealt with chest pains and sudden death in workers exposed to nitroglycerol or nitroclycol in combination with nitroglycerine. A report is given of nine persons suffering from chest pains (including one case of sudden death) after exposure to nitroglycerine alone. The symptoms occurred between 30 and 65 hours after the termination of the exposure to the agent. At necropsy no significant signs of atherosclerotic changes in the heart were observed. The symptoms are referred to as "withdrawal symptoms."

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

- 769 Human Exposure to Styrene Vapor. R. D. Stewart, et al. *Arch. Environmental Health* 16, 656-662 (May, 1968).

Human volunteers were exposed to styrene vapor at approximately 50, 100, 200, and 375 ppm for periods of one to seven hours. Only at 375 ppm did the subjects experience significant subjective symptoms and show objective signs of transient neurological impairment. A small portion of the absorbed styrene was rapidly and exponentially excreted from the lungs in the post-exposure period. A measurement of the amount of styrene present in the breath in the early post-exposure period provided a means for making an estimation of magnitude of exposure. The determination of urinary hippuric acid proved to be insensitive as an indicator of exposure to this compound at these vapor concentrations. There are 7 references.

--Authors abs:

- 770 Steatorrhea Induced by Para-aminosalicylic Acid. R. A. Levine.
Ann. Internal Med. 68, 1265-1270 (June, 1968).

Oral administration of para-aminosalicylic acid (PAS) has been reported to induce a variable reduction in serum cholesterol concentration in man and produce malabsorption of vitamin B₁₂. Exaggerated hypocholesterolemic effects of PAS were observed in the presence of hypercholesterolemia. The possible role of malabsorption of fats induced by the drug has not been extensively investigated. The effects of abnormally high (12 g) and normal (6 g) daily doses of para-aminosalicylic acid (PAS) recrystallized with ascorbic acid (PAS-C) on absorptive function was investigated in seven healthy volunteer subjects. Oral administration of 12 g/day of PAS-C for 4 weeks induced moderate steatorrhea, without diarrhea, in all seven subjects. Six grams per day of PAS-C failed to produce malabsorption of fats. The drug exhibited no direct toxic effect on intestinal epithelium, as determined by light microscopy. Jejunal mucosal biopsies performed before, during, and after PAS-C administration, at either 6- or 12-g daily doses, showed no alterations in the normal histology. The degree of steatorrhea did not appear to account entirely for the diminished cholesterol concentrations observed during PAS-C therapy. The data indicate that PAS-C, at the 12-g daily dosage, represents another model for investigation of reversible drug-induced malabsorption in man. In contrast, PAS-C in the doses generally recommended did not induce changes in absorptive function. There are 25 references. --Cond. from text

- 771 Clinical and Immunologic Appraisal of Workers Exposed to Diisocyanates. H. C. Bruckner et al
Arch. Environmental Health 16, 619-625 (May, 1968).

Forty-four isocyanate-exposed and unexposed workers were examined clinically, their work environment investigated, and their blood studied for evidence of an immunologic response to toluene diisocyanate. Repetitive inhalation exposures to excessive concentrations is important in isocyanate sensitization. Retrospectively, isocyanate-sensitized individuals manifested several episodes of increasingly severe irritative mucous membrane symptoms prior to sensitization. Among exposed workers, an allergic diathesis (present before initial isocyanate exposure) was more prevalent ($P = 0.005$) among the sensitized. Immunologic response to isocyanates was detected best by the lymphocyte transformation test. Individuals exposed to low levels of isocyanates developed eye, mouth, and throat symptoms. Minimal responders to isocyanates experienced no bronchial symptoms and had negative past personal histories of allergies. Workers exposed to higher concentrations of isocyanates ("overdose responders") developed bronchial symptoms, headaches, and rarely possessed a prior history of allergic disorders. The isocyanate-sensitive individuals manifested eye, nose, and bronchial symptoms, including audible wheezing, on encountering exposures to minute airborne concentrations of isocyanates. They did not complain of headaches but often experienced repetitive overdose responses prior to the development of asthmatic reactions. Following sensitization, each manifested a progressively shorter exposure-response interval. The asthmatic syndrome occasionally manifested by some isocyanate workers is secondary either to a pharmacologic overdose or to a hypersensitivity mechanism. Both mechanisms may be operative in the same individual, especially if the exposure concentration is relatively high. There are 21 references --Authors' summary

- 772 Acute Respiratory Effects in Workers Exposed to Low Levels of Toluene Diisocyanate (TDI)
J. M. Peters et al. Arch. Environmental Health 16, 642-647 (May, 1968).

Thirty-eight workers exposed to levels of toluene diisocyanate below the threshold limit value were examined at the beginning and end of a work day (Monday). Statistically significant decreases occurred in forced vital capacity (FVC), forced expiratory volume in one second (FEV₁), peak flow rate, and expiratory flow rates at 50% and 25% of vital capacity. Thirty-four of these same workers were examined Friday and it was found that the FVC had returned to baseline, the FEV₁ was still depressed and the expiratory flow rates were more depressed. Diurnal variation could not account for these changes. Workers with respiratory symptoms showed greater decreases in FEV₁ than workers without symptoms. There are 20 references. --Authors' summary

- 773 The Toxicity of Rubber Additives. Findings From a Survey of 140 Plants in Ohio. H. G. Bourne, H. T. Yee, and S. Seferian. Arch. Environmental Health 16, 700-705 (May, 1968).

A description of the types of rubber additives, and the process involving their application in 140 Ohio fabricated rubber products plants, is given. The most frequently used additives found in the survey are listed. The toxicity and carcinogenic activity of these additives, mainly based upon a study of the literature, is reviewed. There are 29 references. --Authors' summary

- 774 Solvents, Smog, and Rule 66. G. W. Fiero. J. Am. Soc. Lubrication Engrs. 23, 448-458 (Nov., 1967).

Some solvents and cleaners evaporated into the air may become pollutants. Their quality, however, is relatively small and their photochemical reactivity is relatively low. Since, however, certain solvents when tested in smog chambers at relatively high concentration (4 ppm) do produce eye irritating products, their use is restricted in Los Angeles by Rule 66 and in the San Francisco Bay area by Regulation 3. These are discussed in detail. The topographical and meteorological characteristics of these locations are unique. Therefore, such restrictions should not be imposed in other localities until a thorough study is made to determine the extent, if any, which solvents may contribute to smog. --APCA absts.

INDUSTRIAL DUSTS

- 775 Adaptation of the Spinning Top Generator to Provide Aerosols in the Respirable Range. J. McK. Ellison. Ann. Occ. Hyg. (London) 10, 363-367 (Oct. 1967).

A special spinning top generator was designed to produce aerosols which contain particles that are monodisperse and are in the respirable range for experiments relating to their effects on the lung. The generator is illustrated and fulfills three essential conditions: (1) the upward velocity of the air must not be less than the falling speed of the droplets when they are formed; (2) the volume of air supplied must be large enough, its humidity low enough and its temperature high enough to ensure that all the water in the mist can evaporate; and (3) the chimney must be of a size to ensure that evaporation is complete before the particles leave it. The generator produces aerosols with drops between 10 and 25 μ in diameter; it is limited only by the fact that the droplet concentration cannot be greater than that corresponding to 1 ml of initial solution in 60 l of air, if all the water is to evaporate. --APCA absts.

- 776 Removal of Small Particles From Air by Foam in a Sieve-Plate Column. M. Taheri and S. Calvert. J. Air Poll. Control Assn. 18, 240-245 (April, 1968).

Particle collection by foam produced on sieve plate apparatus was studied in a 3 x 3 in. sq column and in a 2 in. diam circular column. Experimental data have been obtained for silica test dust, glass beads, sulfur aerosol, polystyrene beads, and extensively for methylene blue aerosol. A new technique utilizing the Goetz aerosol spectrometer was developed and was used to obtain the collection efficiency as a function of particle diameter. A correlation was developed based on inertial mechanism. In this correlation the collection efficiency is expressed as a function of inertial parameter and foam density. The pressure drop in the operating range varied from 2 to 4 in. of water. There are 11 references. --Authors' absts.

- 777 Turbulent Gas Flow and Electrostatic Precipitation. M. Robinson. J. Air Poll. Control Assn. 18, 235-239 (April, 1968).

Recent research in the United States, Britain, and the Soviet Union has focused attention on the role of turbulence in modifying the effective particle migration velocity of electrostatic precipitation, if not the widely employed Deutsch precipitation equation itself. Due to circumstances of publication, contributions to this subject are unfamiliar to many precipitation workers. This paper reviews the literature in question in the light of recent data, particularly with respect to cross-sectional particle concentration profiles and the effect of the electric wind on gas movement.

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Under electrical and flow conditions similar to those that often prevail in practice, experimental data are presented suggesting that the electric wind makes a significant contribution to gas convection, and so probably should be considered in any comprehensive analysis of precipitator performance. There are 13 references.

--Author's abst

- 778 Health Risks in the Foundry. Anon. Michigan's Occ. Health 13, No. 2, 2-5 (Winter, 1968)

In a recent investigation of foundries conducted by the Division of Occupational Health of the Michigan Department of Public Health, it was found that the Michigan foundry industry faces a serious situation. Based on a survey of 281 plants more than 7% of the employees of this industry are exposed to serious health risks. Management in few of these plants understands or is equipped to handle the problem and little concern is currently expressed. The health problems in the foundry industry can and must be overcome. The responsibility for providing a healthful working environment rests with foundry management.

--Cond. from text

- 779 Chronic Respiratory Disease in Hemp Workers. A. Bouhuys, et al. Am. Rev. Resp. Dis. 98, 150 (July, 1968). Abstr. of paper presented at annual meeting of American Thoracic Soc., May 19-22, 1968.

Workers in the soft hemp industry suffer from byssinosis caused by dust inhalation: acute dust exposure causes a decrease of ventilatory capacity in them as well as in healthy subjects (Bouhuys et al., Arch. Environ. Health 14, 533, 1967). The authors studied the prevalence of chronic respiratory symptoms, forced expiratory volume (FEV_{1.0}), and smoking habits in 216 men with histories of prolonged exposure (20 years or more in 76 per cent) to hemp dust, and in 285 men in farming and other industries. Eighty-seven per cent of the hemp workers gave a history of byssinosis (chest tightness and/or cough on Mondays during work in dust).

--Authors' abst. cond.

- 780 Role of Silica in Progressive Massive Fibrosis. In Coal Workers' Pneumoconiosis. P. C. Pratt Arch. Environmental Health 16, 734-737 (May, 1968).

The hypothesis that silica is the cause of progressive massive fibrosis in coal workers' pneumoconiosis (CWP) would be supported if more silica were present in fibrotic than in non-fibrotic tissue of lungs from coal workers. The present recalculation of data from a previous paper designed to test this hypothesis shows that there is an average of more than twice as much silica, in grams per lung, in fibrotic tissue as compared to nonfibrotic tissue in 17 coal workers' lungs. Excess silica is present in progressive massive fibrosis (PMF) tissue of every lung. It is concluded that silica is responsible for the fibrotic component seen in PMF and that continued search for other fibrogenic mechanism is unnecessary. The excessive local accumulation of dust at certain sites in the lung which permits local concentration of silica to reach levels capable of eliciting fibrosis may be due to coexistent centrilobular emphysema, caseous foci, or scars. Further study of the actual mechanism is suggested. There are 15 references.

--Author's summary

- 781 Ultrasonic Examination of Pleural Thickening and Calcifications in Occupational Asbestosis M. Viikari, J. Jaaskelainen, and E. Tahti. Diseases of Chest 54, 17-20 (July, 1968)

The roentgenologic diagnosis of occupational asbestosis is based upon typical pulmonary fibrosis and anteriorly detected pleural calcifications, which appear much later than parenchymal changes. Therefore, a definite diagnosis usually demands a long observation period. We used ultrasonic A- and B-mode methods to examine pleural changes in nine occupational asbestosis patients and five normal persons. In normal persons the parietal pleura was shown as a thin, sharp line when the B-mode method of examination was used. Roentgenographically observed calcifications were easily detected and distinguished from the normal pleura by this examination. It is noteworthy and similar echo peaks were seen in A-mode examinations in lateral and posterior pleura where roentgenograms did not reveal pleural calcifications, and their size could be traced with the B-mode examination. Thus it is possible to find early pleural changes, which, in our opinion, are connected with occupational asbestosis. Diagnosis could be made earlier without a long observation time. There are 8 references.

--Authors' abst

- 782 Lung Cancer Among Asbestos Insulation Workers. I. J. Selikoff and J. Churg. *Am. Rev. Resp. Dis.* 98, 149 (July, 1968). Abstr. of paper presented at annual meeting of American Thoracic Soc., May 19-22, 1968.

Clinical epidemiologic and pathologic findings in a large series of bronchogenic carcinomas were reported among asbestos workers. Among 632 asbestos insulation workers, followed prospectively from January 1, 1943, to December 31, 1967, there have been 358 deaths. Seventy-two were due to cancer of the lung or pleura, approximately eight times the expected incidence. Epidemiologic data are reviewed, including such factors as lapsed period from onset of exposure, total exposure, relation to smoking habits, and comparative incidence of bronchogenic carcinoma and pleural mesothelioma. A personal series of more than 35 cases, the largest so recorded, is analyzed with regard to such clinical and pathologic characteristics as lower lobe localization, variable cell type, peripheral location including infrequency of abnormal bronchoscopic findings, relation to severity of asbestosis, frequency of pleural involvement, diagnostic pitfalls, et cetera.

--Authors' abstr

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 783 Does Lighting Affect Health? H. L. Logan. *Safety Maint.* 136, 38-41, 48 (Aug. 1968).

Until now recommended lighting levels have been based on the minimum levels at which study, work, or night traffic or recreation can be carried out. The lighting industry has spent much effort finding out what is the minimum lighting level at which a particular visual operation can be acceptably performed; instead of finding out how much light is needed to promote health, reduce the rate of aging, and increase useful life of people. The lower range of optimum lighting levels recent research work indicates could be over 1000 footcandles. The upper range can be found by correlating optimum-for-people external temperature conditions with their accompanying range of natural lighting levels. This shows hygienic lighting levels to maximize at upwards of 2500 footcandles. There is consumption of a quarter of the bodily energy used in the processes of seeing, when vision is normal and illumination is sufficient. Under suboptimum conditions more is used. Middle-aged and elderly teachers, executives, draftsmen, and all people doing close visual work suffer more fatigue than necessary under poor lighting conditions. There is a significant connection between lighting levels and colors. Incandescent light, which is fundamentally a reddish-orange white, makes colors look as expected up to about 50 footcandles. Its spectrum is similar to that of daylight near sunset when low daylight levels occur. Above those levels 3500° K fluorescent light does a passable job up to about 200 footcandles, and 4500° K fluorescent does a fair job up to about 500 footcandles. In the daylight range of 2500 footcandles and up, artificial light should match the corresponding daylight spectrum. Light affects longevity by decreasing or increasing susceptibility to accidents; by increasing or decreasing susceptibility to sickness through improved sanitary practices induced by higher light levels; and by decelerating or accelerating the rate of aging.

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Editor's Note: Also see Editorial "Health Effects of Lighting" on p. ii, this issue. --R. T. P. deT.

RADIOACTIVITY AND X-RADIATION

- 784 Space Ionizing Radiation as a Problem in Aviation and Space Medicine. C. J. Clemedson. *Forsvarsmedicin* 4, 68-79 (April, 1968).

Exposure to space ambient ionizing radiation is one of the many stress factors encountered in space flight. Prospective commercial supersonic air transportation (SST) may encounter this problem. At the cruising altitudes of SST planes (probably between 60,000 and 80,000 feet) solar proton radiation emitted in connection with the relatively rare giant solar flare events may exceed the limits recommended by the International Commission on Radiological Protection (ICRP). Pilots, especially those on the North Atlantic routes, may have to be reclassified as radiological workers to comply with ICRP. Unless exposure to a major solar flare is not avoided, passengers will not be in danger of overexposure to radiation. Since there is no information as to the proportion of pregnant women among air passengers, no special attention has been paid to them. Shielding, radiation monitoring and dosimetry, and warning systems are the prospective means of protection.

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

ENVIRONMENTAL MEASUREMENTS

- 785 Industrial Gas Analysis. A Literature Review. H. N. Wilson and G. M. Duff. Analyst 92, 723-758 (Dec. 1967).

A review of the literature relating to industrial gas analysis from 1958 to 1966 is presented. The areas examined include: permanent and inorganic gases, analysis of liquefied or pure gases, fuel gases, flue gases, motor exhaust gases, analysis of micro samples, and atmospheric pollutants. In no branch of analysis is the swing toward physical methods more marked than in gas analysis. The chief advances have been application of galvanic methods to traces of certain gases and gas chromatography which have contributed to rendering other more conventional methods obsolete. --APCA absts.

- 786 Further Observations on the Ferrous Ammonium Thiocyanate Reagent for Ozone. I. R. Cohen and J. J. Bufalini. Environ. Sci. Technol. 1, 1014 (Dec. 1967).

A reinvestigation of the ferrous ammonium thiocyanate colorimetric method for ozone has disclosed the following facts: this method for ozone has the advantage that a sample collected in the field need not be analyzed until it is returned to the home laboratory. The time lapse may be several days or weeks. Unfortunately, molar absorptivity, although constant for other oxidants such as n-butyl hydroperoxide, tert-butyl hydroperoxide, and hydrogen peroxide, is constant for ozone only at concentrations greater than 2 ppm (v/v). Unless approximate ozone levels are known, the method is not useful if highly accurate ozone levels are desired. --APCA absts.

- 787 Continuous Monitoring of Organophosphorus Compounds in Air With an Alkali Metal-Dual Flame Ionization Detector. M. J. Prager and B. Deblinger. Environ. Sci. Technol. 1, 1008-1010 (Dec. 1967).

The Karmen alkali metal flame ionization detector was adapted to continuous monitoring of air for trace quantities of organophosphorus compounds. To achieve selective detection, a two-stage detector was used. Long operating life could be obtained with a sodium silicate-coated electrode coil. After optimizing the operating parameters it was possible to detect 0.1 μ g of organophosphorus compound per liter of air. Much larger concentrations of nonphosphorus organic compounds gave no response under the same conditions. --APCA absts.

PREVENTIVE ENGINEERING

- 788 Air Pollution Techniques. Wet Scrubbing of Boiler Flue Gas. R. Kopita and T. G. Gleason. Chem. Eng. Progr. 64, 74-78 (Jan. 1968).

Modern wet scrubbing is a highly efficient, economical, and effective method of cleaning gas. A wet scrubbing system which can meet the code requirements for particulates and SO₂ can be constructed of suitable corrosion-resisting materials and is dependable and economical to operate. It can be designed to remove more than 99% of the flyash and 70-99.5% of the SO₂ in the flue gas. The cost of such a system is favorable when compared with the extra cost of low sulfur fuels. --APCA absts.

- 789 Venturi Scrubbers for Small Foundry Cupolas. J. Lagakos. Foundry 96, 70-73 (Jan. 1968)

As air pollution control receives increasing attention from the public and from local, state, and federal government authorities, foundries are faced with the need to upgrade cupola emission controls. This article describes the use of venturi scrubber installations to meet existing code requirements and to meet more stringent requirements in the near future. Systems for small foundries are emphasized. --APCA absts

- 790 The Control of Open Hearth Stack Emissions With Venturi Type Scrubber C. U. Broman and R. R. Iseli. Blast Furnace Steel Plant 56, 143-148 (Feb. 1968).

When oxygen roof lances are installed on open hearth furnaces, an air quality problem is created by fuming. Initial experimentation at Youngstown Sheet and Tube Co.'s Indiana Harbor Works led to the conclusion that no known injection process could suppress the fumes in the furnace enough to meet the requirements of the strict pollution ordinances now in effect. The Venturi scrubber installation which was selected as most suitable for the Indiana Harbor Works is described. Although problems were encountered in the initial two furnace scrubbing systems, they provided a basis for improvement of the later installations. Gas cleaning has been excellent with greater than 99% efficiency and less than 0.05 gr/scf dust loading in the exhaust gases. The scrubber installations have not hampered the operations of the furnaces, and, indeed, there is some basis for suggesting that they may contribute to improved performance. --APCA absts

- 791 Air Pollution Techniques. Production Baghouses. F. R. Culhane. Chem. Eng. Progr. 64, 65-73 (Jan. 1968).

The production baghouse has been broadly applied throughout the metallurgical industry in a variety of conditions and applications. Because of today's emphasis on air pollution control, the proved seasoned performance of the production baghouse now represents one of today's best answers for effective control. The heart of the baghouse is the filter fabric. Design, operation, and application considerations are examined in relation to the four major parameters: Cloth form, type of cloth, method of cloth cleaning, and cloth housing. --APCA absts

- 792 Air Pollution Techniques. Selecting Dust Collectors. J. L. Smith and H. A. Snell. Chem. Eng. Progr. 64, 60-64 (Jan. 1968).

An economic evaluation was made of three types of dust collectors for use with fluid bed roasters for the calcination of phosphate rock. Fabric baghouses, wet scrubbers, and electrostatic precipitators designed to a collection efficiency of 99% were compared on the basis of a 10-year life. The electrostatic precipitator, which was the most expensive to purchase and install, was found to be the least expensive to depreciate and operate over a 10-year period. On the basis of these data, a precipitator was installed at J. R. Simplot Co.'s Minerals and Chemical Division in January 1967 with excellent results. --APCA absts

COMMUNITY AIR HYGIENE

- 793 A Study of Air Pollution Sources as Viewed by Earth Satellites. D. Randerson. J. Air Poll. Control Assn. 18, 249-253 (April, 1968).

Several photographs are presented which illustrate the large scale dispersion of atmospheric pollutants. These photographs were taken by astronauts on various manned spacecraft flights. A spacecraft view of a forest fire in the Apalachicola National Forest revealed a rather large smoke plume. Geometrically scaled measurements indicated the plume was approximately 4 miles wide and about 65 miles long. Trapped under a frontal inversion located between 2500 and 3000 ft. above ground level, this plume was being transported south-southwestward into the Gulf of Mexico by the local wind flow pattern. Several pictures containing examples of industrial smoke plumes in the vicinity of Houston, Tex., are discussed in relation to the local synoptic situation. A picture of industrial haze over Houston, Tex., is presented to illustrate an areal distribution of atmospheric pollutants covering an area of about 2600 square miles. --Author's abst

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- 794 Atmospheric Dirtiness. W. H. Rees.
J. Inst. Heating Ventilating Engrs. (London) 35, 243-252 (Nov 1967).

The Shirley apparatus, developed for the rapid testing of air dirtiness, is described and illustrated. Data presented show it to be very accurate. Air is drawn through a 1-in. diameter circle of Whatman No. 1 filter paper at a rate of 1 ft³/min and the extent of the soiling of the filter paper is given by the increase in its reflection optical density. From this data the Mark unit of atmospheric dirtiness is calculated. The type of filter paper used affects the Mark value while the whiteness of the paper, the rate of airflow through the paper, and the atmospheric dampness have no effect. The mass concentration of airborne dirt derived from optical data showed that the soiling propensity of airborne dirt varies considerably with the time of year. Tabulated data indicate that a knowledge of the concentration of suspended matter alone in any atmosphere will not yield information on the dirtiness of that atmosphere. Conversely, optical data on soiled filter papers cannot be universally converted to mass concentration data for suspended matter. Results of air dirtiness surveys in and around Manchester, both outdoors and inside textile mills, and data for the efficiencies of various types of air cleaning plants are given. It was shown that the air cleaning efficiency of a plant depends on the level of dirtiness outdoors and the type of filter used. A cotton blanket filter yields efficiencies of 95%. Subsequent water washings can sometimes have an unfavorable effect on over-all plant efficiency.

--APCA absts

- 795 An Easy Method of Measuring Acidic Air Pollutants. Anon. Chemistry 41, 32-33 (Jan. 1968)

An easy method utilizing simple, readily available equipment is described for the determination of acid air pollutants. An air pump draws acidic air through a glass thistle tube, covered with a wet-strength white paper towel soaked in a 0.1% solution of methyl orange as an indicator, and a 0.01M solution of sodium bicarbonate as a buffer to nullify the effect of CO₂ on the indicator. A drop of glycerin is added to the paper to prevent drying. When acidic air is drawn through the probe, the indicator changes color. With a constant rate of flow of air through the filter paper and a regular distribution of the acid contaminant in the air, the concentration of the acid is proportional to the time required for the air to pass through the damp paper. The construction of a smog box, to acidify the air for demonstration purposes, is described and illustrated.

--APCA absts

- 796 Division of Environmental Sciences. Microscopic Analysis of Atmospheric Particulates: A Cooperative Study. J. S. Ferguson. Trans. N.Y. Acad. Sci. Ser. II, 29, 673-683 (April, 1967)

A study of microscopic methods to determine the identities and/or sources of atmospheric particulates was conducted by the Analytical Reference Service of the National Center for Urban and Industrial Health. Prepared slides of single-component and multicomponent particulate samples were examined by 35 microscopists. The participants were asked to identify the particulates on each slide and report their results. The results of the study are presented and their significance is discussed.

--APCA absts

- 797 The Effects of Air Contamination on Health. Part I. D. O. Anderson.
Can. Med. Assn. J. 97, 528-536 (Sept. 2, 1967).

The problems inherent in the study of the effects of air pollution upon human health are surveyed in depth. The problems of establishing and evaluating a causal relationship between air pollution and debility are discussed. Sampling problems and the compilation of meaningful statistics according to cogent criteria are also mentioned. The reducing type of pollution (found in London smog) and the oxidizing form (found in Los Angeles smog) are cited as the two major forms of community air pollution. Since disease can be so readily produced by personal and occupational pollution, the problems in elucidating factors in community air pollution leading to disease are multiplied. The health effects of known acute pollution episodes are reviewed. Urban studies in the literature are discussed including: special studies (Pittsburgh, Tokyo-Yokohama); studies in London; and results of respiratory surveys (Wales, England, Scotland, Bornholm, the United States, Canada, London). The consensus of the studies is that the accumulated evidence confirms that air pollution constitutes a health hazard.

--APCA absts

- 798 The Effects of Air Contamination on Health: A Review. Part II. D. O. Anderson
Can. Med. Assn. J. 97, 585-593 (Sept. 9, 1967).

The literature on the health effects of specific pollutants is reviewed. Included are studies on dustfall, sulfur dioxide, oxidizing pollution (as a mixture, or when broken into these components: carbon monoxide, oxides of nitrogen, ozone, and peroxyacetyl nitrate), polycyclic hydrocarbons, industrial sources of community air pollution (especially arsenic, beryllium, and asbestos), and several other pollutants. The effects of low levels of common air pollutants, classified as particulate matter, irritants, oxidants, and systemic poisons, are not known precisely. According to one study, high and significant correlations were obtained between lung cancer mortality in men, and levels of Be, As, Zn, Mo, V, Co, Mn, Pb, and Ti. No correlation was observed for Ni and Sb. In terms of magnitude of the effect, the hazard of long-term exposure to levels of urban pollution is much less than that of personal air pollution by cigarette smoking. The biological effect, however, is similar to that of smoking, and is documented in excess mortality, respiratory conditions, and possibly also in respiratory cancer. The most important constituent currently measured in the air is dust.

--APCA absts

- 799 The Effects of Air Contamination on Health. Part III. D. O. Anderson.
Can. Med. Assn. J. 97, 802-806 (Sept. 23, 1967).

Several topics related to human health and air pollution are discussed: the psychosocial impact of pollution, the vehicular accident hazard of air pollution, air quality levels and human tolerance, and some specific Canadian research into the health hazards of air pollution. The person most sensitive to pollution is the person already debilitated by chronic respiratory disease and associated cardiovascular disease. Reversible physiological responses to pollutants in housewives and pre-school and school-aged children might be used to set levels which can be incorporated into air quality standards. The setting of standards in Russia which, however, are not operational, is briefly discussed. A study of the health hazards of pollution should include its impact upon human ecology, man's society, and upon individual psychological adjustment.

--APCA absts

- 800 Smoke Pollution in Dwellings of Infants With Bronchopneumonia. G. O. Sofoluwe.
Arch. Environmental Health 16, 670-672 (May, 1968).

Homes of 98 children diagnosed as suffering from bronchiolitis and bronchopneumonia were investigated in Lagos, Nigeria. Estimates of the duration of these infants' exposure to smoke emanating from burning firewood was approximately an average of 3.13 hours a day. The children were found to be exposed to average concentrations of 940.2 ppm of CO; 8.6 ppm of NO₂; 37.8 ppm of SO₂, and possibly 85.6 ppm of benzene. These gases at these concentrations could easily irritate the respiratory tract of these infants who could hardly complain or run away from the smoke. There are 9 references.

--Author's abst

- 801 Automatic Stack Monitoring of a Basic Oxygen Furnace. W. P. McShane and E. Bulba.
J. Air Poll. Control Assn. 18, 214-215 (April, 1968).

An American Iron and Steel Institute Continuous Automatic Stack Monitor was installed at the stack outlet of an electrostatic precipitator which collected fumes from a basic oxygen process. The performance of the monitor was evaluated in a comprehensive long period continuous field study; the output signal was calibrated by simultaneous isokinetic filter samples analyzed gravimetrically. Field calibration confirmed results obtained in the laboratory. The device responded promptly to variations in fume concentration which were induced by changing the degree of activation of the fume collector. Concentrations observed in the study ranged from 0.01 to 0.40 g/standard cu ft. This range could be extended to higher and lower values through modifications of the sampling procedures and instrument settings. Data were obtained on both the operation and maintenance of the instrument. Such information will be necessary for instrument manufacturers interested in the production and installation of commercial models. There are 4 references.

--Authors' abst

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- 802 Air Pollution and the Coal Industry. H. Perry and J. H. Field.
Trans. AIME 238, 337-345 (Dec. 1967).

A short review of the legislation enacted in the United States to combat air pollution from the production and combustion of coal is presented. The nature and magnitude of air pollution problems affecting the mining, preparation, coking, and combustion of coal are discussed and the methods available for the reduction of these emissions, particularly during coking, are described. Tabulated data show the range of emissions from combustion of bituminous coal in pulverized fuel or cyclone furnaces and the generation of sulfur oxides in the combustion of coal. Means of combatting particulate emission by the use of mechanical separators and electrostatic precipitators are discussed. Present day collection equipment can be designed for specified conditions to remove at least 99% of solids from the gases. Proposed methods to meet the problem of gaseous emissions currently receiving considerable attention are described, with special emphasis on methods to decrease pollution by sulfur oxides. The possible, but not always practical, methods for the reduction of sulfur oxides are discussed. They include selective mining, coal preparation to remove pyritic sulfur, other physical or chemical methods for removing sulfur, improved combustion efficiency to decrease emissions per unit of energy, use of dolomite or other additives to the furnace, high stacks, and wet and dry gas treating processes.

--APCA absts.

- 803 Performance of Exhaust Control Devices on 1966 Model Passenger Cars. W. F. McMichael, R. E. Kruse, and D. M. Hill. J. Air Poll. Control Assn. 18, 246-248 (April, 1968).

Road tests have been carried out in five different cities with a fleet of 300 passenger cars consisting of three different makes, half of which are equipped with the 1966 exhaust control devices required by the state of California. The performance of these devices during the first series of tests has been evaluated. All three makes of device-equipped cars produced significantly lower emissions of hydrocarbons and carbon monoxide than did similar cars tested in 1962 and 1963. There were no consistent differences among the three makes of cars with respect to carbon monoxide and hydrocarbon emissions. There are 3 references. --Authors' absts.

- 804 Exhaust Gas Problems With Gasoline and Diesel Motors. I. Gasoline Engines. H. Hoffmann. Erdol Kohle 20, 564-568 (Aug. 1967). German.

The "California test" and the events which produced the California and U. S. Government laws for the reduction of air pollution from gasoline engines are described. Differences between California and U.S.A. specifications are outlined. Conditions in regard to air pollution from gasoline engines in various European cities are discussed and compared with those in Los Angeles. The Europa test, concerned mainly with CO emission, is described, evaluated, and compared with the U.S.A. tests which set limits for both CO and hydrocarbons. The three most important control methods for exhaust gases are: (1) catalytic oxidation, which is unsatisfactory, because the catalyst weakens after 8000 km (it became nearly ineffective at the end of a 23,000 km test run). (2) The Chrysler "clean air package" system, which depends on a particular combination of gasoline mixture and ignition time so that, with small alterations in the combustion chamber, the conditions of the U.S. law are fulfilled. (3) The exhaust air injection system which depends on air being blown into the exhaust system. This system, used by Ford and General Motors, also fulfills the U.S. requirements.

--APCA absts

- 805 Exhaust Gas Problems With Gasoline and Diesel Engines. II. Diesel Engines. H. Hoffmann. Erdol Kohle 20, 644-648 (Sept. 1967). German.

Various pollutants present in diesel engine smoke were measured and discussed. Results, illustrated in tables and graphs, show that CO emission is only 1/10 that allowed for gasoline engines and is therefore of minor importance. Aldehydes with their characteristic irritating odor are also produced in small quantities and are considered annoying but medically unimportant. The nitrogen oxides, NO and NO₂, are produced in sufficiently large quantities to cause lack of oxygen in the blood and inflammation of the respiratory tract. The ante-chamber motor produces fewer nitrogen oxides than the direct injection motor. Amount of SO₂ produced is negligible. The 3, 4-benzopyrene is emitted in significant quantities when an engine emits a large quantity

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of smoke and then only if the motor is run under high pressure. As a control measure a reduction in smoke quantity is recommended. Smoke characteristics can also be greatly influenced by design of the combustion chamber and proper maintenance of engines. --APCA absts

- 806 The Foundry—And Air Pollution Control Legislation. B. D. Bloomfield.
Mod. Castings 52, 93-97 (Oct. 1967).

The air pollution problem caused by foundry operations does lend itself to solution. The processes and equipment to combat foundry pollution, and legislative procedures, now in force and proposed, in Michigan are discussed. Zoning becomes an important part of air pollution control and, as the megalopolis extends itself, the long term projection becomes as important as the program for today. More governmental assistance and incentives are needed to encourage, or enable, installation of effective air pollution control equipment. --APCA absts

- 807 Reducing Sulfur Emissions. D. N. Harris. Combustion 39, 36-38 (Nov. 1967).

The subcommittee on sulfur of the engineering and technical research committee of the American Petroleum Institute has reviewed the status of government and industrial activity in the control of sulfur emissions. Processes and cost data for sulfur oxide removal and for desulfurization of fuels are presented in this progress report. Two studies of the air quality in New York City are discussed briefly. Results of a survey of the capital expenditures of the petroleum industry for processes which reduce fuel product sulfur content are summarized. --APCA absts

ACCIDENTS AND PREVENTION

- 808 "Death" From Lightning—And the Possibility of Living Again. Helen B. Taussig.
Ann. Internal Med. 68, 1345-1353 (June, 1968).

This article reviews a number of examples of persons who were struck by lightning and recovered. Statistics indicated that more persons recover after being struck than are killed. A person struck by lightning is instantaneously rendered unconscious. Heart action and respiration cease. Spontaneous recovery may occur if respiratory narcosis is not too long. The heart usually starts in sinus rhythm with marked bradycardia. Minor electrocardiographic changes are common; myocardial infarction is rare. When the patient first regains consciousness he may be mute and unable to move. Burns may be severe but heal remarkably easily. Transient headache and hypertension are common. Fractures of the limbs or skull may occur when the person is thrown to the ground. Most of the reports concern spontaneous recovery. In strikingly few reports was any effort made to resuscitate the person who had been killed. Nevertheless, the report of Ravitch and colleagues shows the importance of cardiopulmonary resuscitation and prolonged artificial respiration for a person who appears to have been killed by lightning. Furthermore if recovery occurs, it is usually complete except for possible impairment or loss of sight or hearing. In my opinion, if a group of persons are struck by lightning, attention should first be directed to the dead, because those who show signs of life will in all probability recover even though burns or injuries may need treatment. There are 28 references.

--Author's summary

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