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# *Industrial Hygiene Digest*

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL

MAY, 1967  
(Vol. 31, No. 5)

INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE -- PITTSBURGH, PA. 15213

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## INDUSTRIAL HYGIENE FEATURES

The psychophysiological testing of human subjects exposed to solvent vapors is studied in Abst. No. 441.

Abst. No. 442 discusses behavioral psychotherapy.

Abst. No. 443 presents advances in the understanding and treatment of head injury.

See Abst. No. 447 for prognosis for survival after stroke.

Abst. No. 450 reports on death from respiratory system disease among Seventh-Day Adventist men.

Immunization against rabies is investigated in Abst. No. 453.

Dr. Samuel Johnson's emphysema is discussed in Abst. No. 456.

The treatment of severe burns with aqueous silver nitrate is described in Abst. No. 461.

Consult Abst. No. 463 on cryogenic temperature studies of the human skin.

Abst. No. 467 surveys arsenicals in biology.

Abst. No. 468 examines the biological role of chromium trace elements in nutrition.

The toxicity, detection and formation of iron pentacarbonyl are described in Abst. No. 469.

The nutritional metabolic role of zinc is discussed in Abst. No. 474.

Details on lead poisoning from drinking soft water are given in Abst. No. 475.

Abst. No. 477 is concerned with toxic substances and ecological cycles.

The pulmonary response to lignite and activated carbon dusts is investigated in Abst. No. 479.

## FOUNDATION FACTS

MEETINGS: Dr. Robert T. P. deTreville, Managing Director, participated in a meeting of the IHF Nursing Committee May 10 at Mellon Institute held at the request of Mr. Harris Shettel of American Institutes for Research to discuss an industrial mental health questionnaire. This is intended to be completed by thousands of industrial health nurses as an important part of the Foundation's Employee Mental Health and Industrial Nursing Practices Study. Data from these questionnaires will help develop descriptions or definitions which can be used in better identifying emotional problems which exist and may be observed in the occupational nurse's day-to-day contact with employees. Progress on this Study will be reported at the 32nd Annual Meeting.

Dr. Paul Gross, Director of IHF Research Laboratory, conducted a Seminar on Asbestos Bioeffects (see p. i), while Professor Theodore F. Hatch moderated an informal meeting on Biostatistical Research on May 18-19, also held at Mellon Institute.

Approval was given of the tentative program for the 32nd Annual Meeting at the Board of Trustees meeting May 17. New proposals analyzed included expansion of IHF research in conjunction with universities and other interested research and educational institutions and agencies wishing to cooperate. In this regard, creation of a comprehensive Pulmonary Research Center at the University of Pittsburgh, based on the present IHF Research Laboratory, was considered. A proposal that IHF sponsor publication of a Review of Industrial Hygiene Highlights, which would offer up-to-date information on current research investigation in the various aspects of industrial hygiene, was discussed.

STAFF ACTIVITIES: Dr. Paul Gross was "Professor for the Day" at St. Luke's Hospital, Bethlehem, Pa. on May 9. He presented a paper, "The Mechanisms of Some Structural Alterations of the Lung Caused by Environmental Stresses" before the staff of the hospital. At the American Industrial Hygiene Association Meeting, Dr. William E. Rinehart presented a paper, "The Effect on Rats of Single Exposure to Crotonaldehyde Vapors", authored jointly with Drs. Gross and deTreville. Dr. Gross attended a Symposium on Coalworkers' Pneumoconiosis at West Virginia University, May 18-20.

PUBLICATIONS: A Publications List describing available reprints, technical bulletins, annual meeting transactions and periodicals is enclosed with this issue.

32nd ANNUAL MEETING - October 10-11 - Chatham Center  
-- Pittsburgh, Pennsylvania --

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November 1992

IN RE: ABRAMS

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ASBESTOS BIOEFFECTS SEMINAR AT MELLON INSTITUTE  
April 17, 1967



Participating in the seminar were:  
(Left to Right) —Dr. John Davis, Dr. André Collet, Dr. Paul Gross, and Dr. John Knox

Utilizing Mellon Institute's technical expertise and high resolution electron microscopic and electron diffraction equipment, Dr. Paul Gross, Senior Fellow of Mellon Institute and Director of the Industrial Hygiene Foundation's Research Laboratory, has undertaken the expanded studies on fibrous dusts, described in the Annual Report for 1966.

With partial governmental assistance (in the form of a \$55,000 contract from the USPHS, Division of Occupational Health, and a \$34,000 grant from the Mellon Institute's National Institutes of Health General Research Fund), Dr. Gross has initiated studies to produce much needed knowledge concerning the occurrence, pathogenesis and significance of "so-called" asbestos, or ferruginous bodies, using experimental models as well as human autopsy specimens.

Essential to this undertaking has been the generous collaboration of the following research personnel: Dr. John Davis, of Cambridge University; Dr. William Granquist, of the National Lead Company Fellowship at Mellon Institute; Dr. T. Harrison Davies, Dr. Robert Rice, Dr. L. Vassamillet, Mr. Martin N. Haller, Miss Alida C. Swanson and Mr. L. J. Foran, of the Mellon Institute's Biochemistry and Molecular Biology Laboratories.

On the occasion of Dr. Davis' second trip to Pittsburgh in support of the studies, Dr. John Knox, Medical Consultant for Turner Bros. Asbestos Company, Cambridge, England, and Dr. André Collet, of the Centre de Etudes et Recherches, des Charbonnages de France, Paris, France, who were also visiting Dr. Gross, participated in an informal meeting held the afternoon of Monday, April 17 in the Conference Room at Mellon Institute. The seminar was attended by members of the local scientific community and interested representatives of member companies of the Industrial Hygiene Foundation.

The meeting was strictly technical, but the press was invited to attend a social hour immediately thereafter to honor the speakers. (See News Section, item 419).

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IN RE: ABRAMS  
November 1992

INDUSTRIAL HYGIENE DIGEST  
Literature and News

NEWS ITEMS

419 Asbestos Bioeffects Seminar

Asbestos has been wrongly accused as an air pollutant and can be easily controlled in the factory, according to Dr. John F. Knox, medical adviser to the British asbestos industry. British industry has controlled the asbestos pollution problem by strategic ventilation. Dr. Knox contradicted recent findings of asbestos fibers in the lungs of persons who died many miles from asbestos plants. He said that many fibers simulate those of asbestos, thus creating an unnecessary dread of this fireproof material. Recent studies in a textile mill in Rochdale, England (largest in the world outside of the Soviet Union, he said) proved that the workers there have no greater mortality rate than the rest of England. Dr. Knox was one of three European experts on this subject — who (Editor's note ... with Drs. Gross and deTreville of IHF) participated in a seminar on asbestos "bio-effects" at Mellon Institute, April 17. Dr. John M. G. Davis, University of Cambridge pathologist, reported on the processes by which asbestos damages lung cells. Dr. André Collet, of the Coal Research Center of Paris, France, reported that fragments of coal mimic those of asbestos in the lung, and the two cannot be distinguished by a light microscope. Only with an electron microscope, he said, can the distinction be made.

--From an article in The Pittsburgh Press, April 18, 1967

420 Mass Comprehensive Health Coverage Wanted by Detroiters

Ninety per cent of 1200 Detroiters interviewed want all hospital, surgical, dental, physician private office, drug, and home nursing services covered by insurance, and this through independent companies, rather than government. City surveys rarely find such almost unanimous agreement on any issue, according to Dr. Charles A. Metzner, University of Michigan public health psychologist, who says, "A politician could base his platform on complete health coverage and no doubt win". . . . We can't explain such universal agreement by income groups, educational differences or political preference. There is little variation of opinion on health insurance needs between those in the inner city, outer city, or inner and outer suburbs. Those who want health coverage say they want all types, with hospitalization leading the line of preferences. Although such complete insurance is not available at present, Dr. Metzner predicts that mass prepaid health coverage will become a certainty in the near future and that. . . "within 30 years, most dentist and doctor bills will be paid by the employee's company or insurance agency." The Detroit study will be followed by a two-year study of prepaid medical practice in Cleveland. The U.S. Public Health Service is supporting the research.

-- University of Michigan News, May 1967

421 Environmental Studies Board.

Increased activity in pollution control and other environmental problems has prompted the establishment of a joint Environmental Studies Board by the National Academy of Sciences and the National Academy of Engineering. The board will coordinate activities of the two organizations in this area, recommend new studies and projects, and work with the government in attacking problems dealing with the quality of the environment. A major emphasis of the board will be to serve as a national focus for broad interdisciplinary efforts in reducing and controlling environmental problems. Dr. Harold Gershinowitz, former president of the Shell Development Company, is chairman of the seven-member board. The establishment of such a coordinating body within the Academy structure was recommended in a 1965 report of the President's Science Advisory Committee — "Restoring the Quality of Our Environment." Five of the eight divisions of the Academy-National Research Council, are presently studying pollution problems.

-- Science 155, 1390 (March 17, 1967)

422 Population Exposure to X-Rays.

Results of a nationwide x-ray exposure study conducted by the U.S. Public Health Service are presented in a newly published report, Population Exposure to X-Rays, U.S., 1964. In addition to the principal findings, the report contains a description of the background, objectives, design, and methods and procedures used in the study to produce estimates of exposure for a variety of personal and demographic characteristics of the U.S. population. The information gathered in the study will be used chiefly to guide the development of programs for promoting more efficient use of x-rays, to establish a baseline for evaluating program effectiveness, and to formulate hypotheses for further research. The study design also provides a basis for estimating specific

organ and genetic dose from x-ray exposure when used with models now being developed from current research at several universities. The study was undertaken jointly by the Public Health Service's Division of Radiological Health and National Center for Health Statistics. Copies of the report (PHS Publication No. 1519) are available at \$1.50 each from the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402.

-- Am. Ind. Hyg. Assn. J. 28, 75 (Jan.-Feb. 1967)

423 Cleaning Fluid.

Take Care with Cleaning Fluid is the subject of a practical new four-page folder published by the National Fire Protection Association (NFPA). The two-color illustrated leaflet urges home users of spot removers and other cleaning fluids to follow a four-point precautionary routine in cleaning clothing and upholstery and in workshop projects. Never use benzine or gasoline for these purposes, the folder warns, for "gasoline is a fuel, not a cleaner!" Produced by NFPA in time for use in Spring Clean-Up campaigns, this folder measures 3 1/4 x 5 1/2 inches, making it particularly suitable as an envelope stuffer. A free sample copy and price information on this folder is available by writing to the Public Relations Department, National Fire Protection Association, 60 Batterymarch Street, Boston, Mass. 02110.

424 Vinyl Bromide.

A new 12-page booklet explaining the nature and properties of vinyl bromide is now available from The Dow Chemical Company. The booklet discusses physical properties, reactions, actual and potential applications, and toxicological properties of vinyl bromide. Vinyl bromide is the first bromine-containing vinyl monomer ever produced on a commercial scale. The booklet is available free from Inorganic and Bromine Chemicals Section of Chemicals Sales, The Dow Chemical Company, 2020 Abbott Road Center, Midland, Michigan 48640.

-- Am. Ind. Hyg. Assn. J. 28, 94 (Jan.-Feb. 1967)

425 Paper Clothing Hazard.

When your paper dress is dirty, throw it away. Or, if you wear it after it has been laundered, don't stand near an open flame. Paper clothing which has been washed, dry cleaned, or worn in a soaking rain is a potential fire hazard, says Dr. Richard E. Marland of the U.S. Public Health Service. The chief of USPHS's Injury Control Program says that paper garments lose their flame-retardant finish when they are washed. He is also asking the Bureau of Standards to test new paper clothing for flame resistance. -- Chem. Eng. News 45, 132 (April 3, 1967)

426 Hospitals.

Hospitals are hazardous and getting more so, according to Dr. Paul E. Stanley, a Purdue University research scientist, who points out that the dangers could be eliminated with relatively simple engineering techniques. His words of precaution were directed against the increasing hazard of electrical shock. He feels that the growing number of heart failures during surgery may be caused by the numerous electrical instruments which may not have been properly installed or maintained. He states that these monitoring and diagnostic instruments are not covered by the electrical safety code either in design or in installation.

-- Safety Maint. 133, 10 (April, 1967)

427 International Controls on LSD Recommended.

An international narcotics board has termed lysergic acid diethylamide (LSD) a "dangerous substance" and called for quick establishment of effective international controls. The eight-man Permanent Central Narcotics Board, Geneva, Switzerland, also said in its annual report that it would "gladly" join the World Health Organization in a study of the problems involved in setting up international controls over sedatives and stimulants. --AMA News 10, 11 (Mar. 13, 1967)

428 International Death Certificate.

An international death certificate has been advocated by a panel of World Health Organization (WHO) epidemiologists. Certificates in use in most countries today do not require listing of multiple causes of death when more than one chronic disease is present, but complete information, WHO experts believe, can be of vital importance as a weapon against chronic diseases.

-- Chronic Illness Newsletter 18, 3 (Feb. 1967)

429 APCA Meeting.

With the theme "Looking Ahead," the 60th Annual Meeting of the Air Pollution Control Association will be held June 11-18, 1967 in Cleveland, Ohio, at the Sheraton-Cleveland Hotel. The only national technical conference devoted exclusively to air pollution control, it will feature an exhibition of the latest abatement equipment and air pollution instrumentation. For further information, write to Arnold Arch, Executive Secretary, Air Pollution Control Association, 4400 Fifth Avenue, Pittsburgh, Pa. 15213.

430 Industrial Noise and Engineering Control Seminar.

The Pennsylvania State University Center for Continuing Education announces a seminar on Industrial Noise and Engineering Control to be held June 25-30, 1967. This seminar has been designed to give guidance to persons responsible for noise control and hearing conservation programs in industry. The prevention of occupational hearing loss in an industrial population requires a rather comprehensive program to evaluate the noise environment and to engineer the necessary controls. Recognized leaders in various technical areas will join members of the university faculty to cover such subjects as the physics and measurement of sound, physiologic effects and measurements, medical-legal aspects, and the fundamentals of noise control. Complete details on fees, registration, accommodations, and the program are available from: Conference Center — Continuing Education, J. Orvis Keller Building, The Pennsylvania State University, University Park, Pennsylvania 16802. -- Am. Ind. Hyg. Assn. J. 28, 75 (Jan-Feb, 1967)

Editor's note: The seminar was announced as being limited to about 40 persons and early application was advised, so that enrollment may be already filled; however, it is understood that additional seminars may be scheduled if needed for additional interested persons. --RTPdeT.

431 Oxides of Nitrogen in Air Pollution.

The subject of the 1967 Gordon Research Conference on Environmental Sciences will be Air Pollution: The Oxides of Nitrogen. This conference will be held July 3 to 7 at Crystal Inn, Crystal Mountain, Washington. Dr. E. R. Hendrickson, Vice President of Resources Research, Inc. is chairman of the conference and Dr. Walter Weber of the University of Michigan will be Vice Chairman. The aim of the conference is to summarize existing knowledge, to discuss research in progress, and to indicate further research needs in respect to the role of oxides of nitrogen and the photochemical processes in air pollution smog. The production, monitoring, effects and control of the oxides of nitrogen will be discussed. The Gordon Research Conferences provide a forum for informal, uninhibited discussion of selected research topics. No papers or conference proceedings are published, and all comments are strictly off-the-record. Attendance is limited to about 100 participants. Persons interested in attending the conference are invited to make inquiry to Dr. W. George Parks, Director, Gordon Research Conferences, University of Rhode Island, Kingston, Rhode Island 02881.

-- Am. Ind. Hyg. Assn. J. 28, 61 (Jan.-Feb. 1967)

## COMING EVENTS

- 432 June 5-7 National Academy of Sciences-National Research Council, Public Symposium on Medicated Feeds, State Department, Washington, D. C.
- June 8-10 Manufacturing Chemists Association, 95th Annual Meeting, White Sulphur Springs, West Virginia.
- June 10-15 American Society of Radiologic Technologists, (39th Annual Convention) St. Louis, Missouri.
- June 11-15 American Nuclear Society, 13th Annual Meeting, San Diego, California.
- June 11-15 9th Annual National Industrial Pharmaceutical Research Conference, Land O'Lakes, Wisconsin.
- June 11-16 Air Pollution Control Association, 60th Annual Meeting, Cleveland, Ohio.
- June 11-16 Medical Library Association, Miami, Florida.
- June 12-14 American Neurological Association, Atlantic City, N. J.
- June 14-18 Toilet Goods Association, Annual Convention, Lake Placid, N. Y.
- June 15-16 American Rheumatism Association, New York, N. Y.
- June 15-17 American Medical Women's Association, Denver, Colorado.
- June 15-17 Endocrine Society, Bal Harbor, Florida.
- June 15-18 American Therapeutic Society, Atlantic City, N. J.
- June 15-19 American College of Chest Physicians, Atlantic City, N. J.
- June 16-17 American Geriatrics Society, Atlantic City, N. J.
- June 17-18 American Diabetes Association, Atlantic City, N. J.
- June 18-22 American College of Preventive Medicine, Atlantic City, N. J.
- June 18-22 American Medical Association, Annual Convention, Atlantic City, N. J.
- June 18-22 Society for Investigative Dermatology, Atlantic City, N. J.
- June 18-24 American Urological Association, Honolulu.
- June 18-30 Symposium on Algae, Man and the Environment, Syracuse University, Syracuse, N.Y.
- June 25-30 American Society for Testing & Materials, 70th Annual Meeting, Boston, Mass.
- June 26-27 American Society of Pharmacognosy, University of Michigan, Ann Arbor, Mich.
- June 26-29 American Orthopaedic Association, Hot Springs, Va.
- June 29-30 Symposium on Some Aspects of Drug Safety, Ottawa, Ont.

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## LEGAL DEVELOPMENTS

433 Workmen's Compensation Changes.

A review of changes in the states' regulations for Workmen's Compensation during 1966 indicates a number of additions and revisions. New York State extended its coverage to agricultural workers, school aides and volunteer state workers. Virginia added clerks and other employees of juvenile and domestic relation courts; South Dakota, game wardens; Kentucky, National Guard members on active service; Massachusetts, some elected or appointed city or town officials; West Virginia, airport authority employees in certain counties. Maximum weekly benefits were raised in Alaska, Nevada, New Jersey, Rhode Island, South Carolina, South Dakota, and Virginia, while New York removed the maximum benefit limitation of \$6500 for temporary total disability. Nevada raised the wage level to \$350 on which temporary total benefits are computed. New Jersey changed the maximum for total disability to 66 2/3 percent of the average weekly wages earned by all employees covered by the unemployment compensation law, and also raised the death benefits. South Dakota, South Carolina and Virginia raised the total compensation for disability and Hawaii and Virginia raised the amount for death.

-- Safety Maint. 133, 10 (April, 1967)

434 Water Pollution.

Federal attention is focusing on water pollution caused by boats and ships. Interior Department's Federal Water Pollution Control Administration is preparing a report on the subject for Congress. Due July 1, the report includes data from field studies in San Diego Bay, the Great Lakes, and New York harbor. A shorter report on work being done at federal installations and on government vessels is already on the President's desk. The Navy installed some maceration-chlorination units on a few of its patrol boats last year and is presently testing a colloid mill-iodination unit. Also, the Navy has given a research and development contract for an oil-fired incineration and electrochemical treatment system.

-- Chem. Eng. News 45, 59 (April 3, 1967)

435 Quinine Cartel.

The Department of Justice is investigating a Dutch quinine cartel to see if U.S. antitrust laws have been violated. The probe is based on one cartel member's secret papers unearthed by the Senate Antitrust Subcommittee. Sen. Philip A. Hart (D.-Mich.), chairman of the committee, says the current "outrageous" price of quinine in the U.S. is the result of cartel activities. If U.S. laws have been violated, says Donald F. Turner, head of the Antitrust Division, Justice will try to get jurisdiction over the firms involved. -- Chem. Eng. News 45, 47 (April 3, 1967)

## BOOKS, PAMPHLETS AND NOTICES

436 Proceedings of The National Symposium on Quality Standard for Natural Waters. University of Michigan School of Public Health. AVAILABLE FROM: School of Public Health Continued Education Service, 1424 Washington Heights, Ann Arbor, Michigan 48104. ix + 317 pp (July, 1966) Price: \$5.00.

The National Symposium on Quality Standards for Natural Waters was organized to provide an opportunity to explore in a university setting several of the issues involved in the establishment of standards on interstate waters as required in the Water Quality Act of 1965. However, it was not the intent of the meeting to recommend the establishment of any specific standards. Two relevant portions of the Act are as follows: Section 5-(1). The water quality criteria and the plan for their implementation and enforcement adopted by a State shall be the water quality standards applicable to the interstate waters or portions thereof within that State if the Governor or State water pollution control agency files within one year from enactment a letter of intent that the State, after public hearings, will adopt such criteria and such a plan before June 30, 1967, and if the Secretary determines that the criteria and plan are consistent with the purposes for which standards are to be established. Section 5-(3). Standards shall be such as to protect the public health or welfare, enhance the quality of water and serve the purposes of the Act. In their establishment consideration shall be given to their use and value for public water supplies, fish and wildlife propagation, recreation, agriculture, industry and other legitimate uses. The Symposium program was designed to consider material of interest to water pollution scientists and administrators, members of water pollution control boards, water economists, and attorneys. The following headings and topics are abstracted from the Table of Contents:

Developments in Water Quality Control: Legislative History and Future Programs; Federal Water Pollution Control Administration Policies and Procedures; Intergovernmental Relations; Comparison of American and European Practice; Meaning of Water Quality Standards: Quality Standards for Natural Waters (Historical Background); Methodology in Establishing; The Legal Implications; Some Economic Implications of Water Quality Management; Economic Planning; Stream Flow Regulation for Water Quality Management: Effects of Impoundments; Planning of Impoundments; Streamflow Management; Management and Measurement of "DO" in Impoundments; Pumped Storage for Drought Control and Multipurpose Water Resource Development; Advanced Methods of Water and Wastewater Treatment: Physical Separation Methods; Chemical Methods; Biological Methods; Operating Experiences; Water Quality Requirements for Specific Water Uses: For Public Water Supplies; For Aquatic Life; For Recreation, For Industry; For Agriculture; Natural Purification: What Do We Know?; Survival of Bacteria and Viruses in Natural Waters; Biological Transformations in Self-Purification; Chemical Transformations in Self-Purification; Water Quality Characterization: Defining Natural Water Quality; Physico-Chemical Methods of Separation; Organic Analyses; Biological Techniques; Management of Pollution Sources to Meet Standards: Municipal Waste Sources; Industrial Waste Sources; Management of Agricultural Resources to Minimize Pollution of Natural Waters; Quality Standards for Natural Waters—A Summary. In summarizing the symposium, Professor Gerard Rohlich (Director of the Water Resources Center and Professor of Civil Engineering of the University of Wisconsin) commented that in the preceding two years, three major pieces of federal legislation had been enacted: The Water Resources Research Act; The Water Resources Planning Act; and the Water Quality Act of 1965. Although the sequence is logical, the short lag period between acts (only three months between the second and third, for example) "has not made fully realizable the potentials that can come forth from the research and planning programs..... certainly much of our water quality control is going to be integrated with the water resource planning activity and the river basin and regional planning programs that are made possible through the water resources planning act....." The discussions which follow most of the papers add to the value of these proceedings, which will be of interest to all having public health conservation and environmental pollution control responsibilities. --RTPdeT.

- 437 Bibliography on Incineration of Refuse and Waste. R. C. Corey, H. C. Johnson, and Hazel C. Anderson. AVAILABLE FROM: Mr. Arnold Arch, Executive Secretary, Air Pollution Control Association, 4400 Fifth Avenue, Pittsburgh, Pa. 15213. Photocopy, loose-leaf 248 + 25 pp. (1966). Price: \$25.00.

This annotated bibliography was sponsored by the Air Pollution Control Association's (APCA) Committee on Incineration (TA-3) chaired by Clare W. Wilson of the American Incinerator Corporation. It was prepared under the direction of Richard C. Corey, Research Director, Pittsburgh Coal Research Center, of the Bureau of Mines of the U.S. Department of Interior. Assistance was provided by Herbert C. Johnson, Principal Air Pollution Engineer, Bay Area Air Pollution Control District, San Francisco, California. Hazel C. Anderson, also on the staff of the Pittsburgh Coal Research Center, was Technical Writer-Editor. This bibliography, which covers the literature up to January 1966, contains 440 references and effectively updates the one prepared by the USPHS Division of Air Pollution covering the period 1945-60 which appeared in the July 1962 issue of the APCA Journal. References are classified as follows: General Considerations of Incineration; On-Site Incineration of Residential Wastes; On-Site Incineration of Commercial and Industrial Wastes; Central Incineration of Community Wastes; On-Site Incineration of Special Wastes; Incineration in Salvage Operations; Incineration of Testing Incinerator Performance and Emissions; and Incinerator Design, General. Each section is arranged alphabetically by author and is numbered separately. Subject and author indices give both group and abstract number for each entry. RTPdeT.

#### INDUSTRIAL MEDICAL PRACTICE

- 438 Carpets' Effect on Microbiology of Air in Hospital Patient Care Areas. Parts I and II. E. W. Mood. Soap Chem. Specialties 42, 62-64, 80 (Aug. 1966); 76, 80, 116 (Sept. 1966).

The number of viable, airborne bacteria in patient care areas of hospitals is influenced by unidentified factors to a greater extent than by the presence or absence of carpets in the corridors in contrast to conventional floor covering. Until these unidentified variable are identified and evaluated, decisions concerning the placement of carpets should be based upon factors other than any potential effect upon the microbiology of the air in patient areas. There are 6 references. -- Public Health Eng. Absts.

- 439 The Gangrene Organism—A Food-Poisoning Agent. J. E. Despaul.  
J. Am. Dietet. Assn. 49, 185-190 (Sept. 1966).

Circumstantial evidence indicates that a high percentage of food-poisoning outbreaks of unknown etiology is caused by Clostridium perfringens. Meat, poultry, and fish products provide ideal media for its growth. The most heat-resistant strains will survive ordinary cooking; however, not only the vegetative cells of C. perfringens, but those of all other species as well, can be destroyed if proper heating is used. There are 41 references. -- Public Health Eng. Absts.

- 440 Comprehensive History Taking for the Non-Psychiatrist. M. Straker.  
Can. Med. Assn. J. 96, 39-44 (Jan. 7, 1967).

To an increasing degree the psychiatrist is oriented to the community and general hospital either as consultant, therapist, or collaborator in overall patient management. In these new roles, he becomes a more comprehensive physician and also conveys psychiatric insights to his colleagues. Psychological factors and the patient's personality "style" influence the development and course of every disease, complicating diagnosis and effective treatment. It is a basic requirement that a good working alliance be established between patient and physician. This is assisted by comprehensive history taking, which clarifies the life-setting in which the illness began, the patient's personality and his habitual reactions of emotional regression under stress. It will also point up errors introduced by the patient, omissions, and distortions in offering the subjective data which the physician must evaluate. Seven major personality types and appropriate physician responses are outlined: the dependent demanding oral patient, the orderly controlled obsessive, the dramatic seductive hysteric, the long-suffering masochist, the querulous paranoid, the overbearing narcissist and the aloof withdrawn schizoid. The non-psychiatrist can resolve complex and puzzling medical problems if he has an increased awareness of how emotional forces complicate illness, and if he can exploit comprehensive history taking to the full. -- Author's abstr.

- 441 Psychophysiological Testing of Human Subjects Exposed to Solvent Vapors. G. J. Stopps and M. McLaughlin. Am. Ind. Hyg. Assn. J. 28, 43-50 (Jan.-Feb. 1967).

The purpose of the experiments reported here was to assemble tests sensitive enough to measure changes in psychophysiological functions in human subjects exposed to low concentrations of solvent vapors. Four concentrations of trichloroethylene were studied, ranging from the 1965 threshold limit value of 100 ppm upward to 500 ppm. Results showed no significant effect of 100 ppm of trichloroethylene on psychomotor performance; however, there was a progressive decline in performance with increasing trichloroethylene levels at higher concentrations. Similar experiments were performed using Freon-113 (1, 1, 2-trichloro-1, 2, 2-trifluoroethane) in concentrations ranging from 1, 500 ppm to 4, 500 ppm. No significant effect of Freon-113 on psychomotor performance was seen at 1, 500 ppm, but slight deterioration appeared at 2, 500 ppm, and progressively higher concentrations resulted in an increasing decrement in performance. Three references are given. -- Authors' abstr.

- 442 Behavioral Psychotherapy. A. Bandura. Scientific Am. 216, 19, 78-86 (March, 1967).

Most theories of learning rely heavily on a limited range of principles established on the basis of studies of animals or of human learning in one-person situations. In order to account adequately for social phenomena it is necessary to extend and revise these principles through studies of the acquisition and modification of human behavior in social situations. Preliminary applications of social-learning approaches to psychotherapy indicate that these methods hold considerable promise; they need to be developed further, extended to the treatment of multiple problems and evaluated after a sufficient period has elapsed. Many new methods of psychotherapy have been introduced enthusiastically and then have been retired by controlled studies. The fact that social-learning therapies are based on established principles of behavior and are subjected to experimental study at each stage of development, gives us reason to expect them to weather the test of time. The day may not be far off when psychological disorders will be treated not in hospitals or mental hygiene clinics but in comprehensive "learning centers" when clients will be considered not patients suffering from hidden psychic pathologies but responsible people who participate actively in developing their own potentialities.

- 443 Advances in the Understanding and Treatment of Head Injury. J. P. Evans.  
Can. Med. Assn. J. 95, 1337-1348 (Dec. 24 and 31, 1966).

The author describes his personal involvement in head injury prevention and management over the past 40 years. He reviews the evolution of knowledge concerning the role of increased

intracranial pressure, and considers the importance of cerebral vasoparalysis in the production of signs and symptoms following head injury, and the development of methods of recording intracranial pressure continuously over hours and days. The development of an experimental compression model has led to a fuller understanding of edema of the brain and has provided a means of studying, by light and electron microscopy, the histological changes that result from edema. More recently, analyses of biochemical changes and disturbed membrane function have opened up a new avenue of potential treatment. Moreover, it is now clear that cerebral vascular dilatation and abrupt pressure increase can be produced in the monkey, in over 50% of cases, by lesions in the dorsomedial nucleus of the hypothalamus. Similar lesions may occur in the human and this suggests other therapeutic approaches. There is, then, a genuine hope of a breakthrough in the management of head injuries.

-- Author's abst.

- 444 Pulmonary Microembolism. F. W. Blaisdell, et al. Arch. Surg. 93, 776 (1966).

There were 31 deaths following 400 major vascular reconstructions at San Francisco Veterans Hospital. Twenty-five of these occurred in 106 emergency operations. In 18 the cause of death was cardiopulmonary and in eight it was exsanguination. Many deaths that had been attributed to pneumonia, congestive failure or myocardial infarction were in fact due to pulmonary microembolism, a frequent cause of morbidity and death after major vascular surgery. The syndrome of pulmonary microembolism is characterized by local shock which allows disseminated intravascular coagulation below the aortic occlusion, bleeding problems as a result of depletion of clotting factors and fibrinolytic overactivity, respiratory insufficiency and manifestations of low cardiac output. There are no characteristic pulmonary x-ray changes. Autopsies reveal fibrin emboli 50 to 200 microns in diameter in those patients who died within five days of operation. Preventive measures include the avoidance of regional shock and systemic hypotension, and the use of heparin. Treatment is by tracheostomy and ventilation with 100% oxygen.

-- Can. Med. Assn. J. Absts.

- 445 The Pathogenesis of Human Myocardial Infarction. G. Rona. Can. Med. Assn. J. 95, 1012-1019 (Nov. 12, 1966).

Coronary arteriography, dissection of the coronary arteries and histopathological examination of the heart were carried out in 150 autopsies to study the effect of coronary narrowing and occlusion, of the presence of collaterals, and of coronary artery predominance on the development of myocardial infarction. The thrombosis rate was related to the severity of coronary sclerosis. The development of collaterals was not enhanced by coronary sclerosis and occlusion, and collaterals did not protect the myocardium against reinfarction. Coronary occlusion was regularly demonstrable in recent myocardial infarct cases. The association of atrial and posterior ventricular infarcts was explained by occlusion of their common arterial branch. The interdependence between coronary sclerosis, thrombosis and myocardial infarction in human autopsy material emphasizes the importance of mural coronary artery disease in the genesis of coronary occlusion and myocardial infarction, and it is at variance with statistical data and experimental results.

-- Author's abst.

- 446 Prevalence and Pathological Changes in Ischemic Heart Disease in a Hard-Water and in a Soft-Water Area. T. Crawford and M. D. Crawford. Lancet 1, 229-232 (Feb. 4, 1967).

A comparison was made of cardiac lesions found in a very soft water area and in a very hard water area in two comparable series of medicolegal necropsies, men who had died from an accident and men who had died suddenly and unexpectedly from ischemic heart disease. In the accident series the prevalence of myocardial scars (healed infarcts) was greater in the soft than in the hard water area. At ages 30 to 44 there was more atheroma and there were more cases with lumen stenosis in the soft water area. The findings in both of these series suggest an increased susceptibility of the myocardium of patients living in the soft-water area.

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

- 447 The Epidemiology of Cerebral Vascular Disease in Canada. An Analysis of Mortality Data. P. C. Gordon. Can. Med. Assn. J. 95, 1004-1011 (Nov. 12, 1966).

Mortality data for cerebral vascular disease in Canada and its provinces were analyzed as an initial approach to the understanding of the epidemiology of this disease. Since 1950, there has been a decline in mortality attributed to vascular lesions of the central nervous system. This decline has been more pronounced in females. Five-year average age-sex-specific rates (1960-64) showed an almost constant proportional increase with age. The highest mortality rates tended to occur in Eastern Provinces. From 1950 to 1964 there was a 21% decline in mortality due to intracranial hemorrhage and a concomitant 53% decline in mortality attributed

to hypertensive disease. Over the same period there was a 24% increase in mortality attributed to cerebral embolism and thrombosis, and an 8% increase in mortality due to arteriosclerotic heart disease. Areal correlations offered only inconsistent support for the hypothesis that these associated trends are due to common etiologic determinants. Evidence presently available does little to clarify to what extent these trends and differences can be attributed to coding, certification and diagnostic practices, and to what extent to changing and differing incidence and prognosis. -- Author's abst.

- 448 Prognosis for Survival After Stroke. J. C. Goldner, et al.  
Am. J. Med. Sci. 253, 129-133 (Feb. 1967).

The prognosis for survival after stroke was studied using 221 patients from the Mid-Missouri Stroke Survey. Age was a major factor in the incidence rate and the case fatality rate of major cerebrovascular episodes. No association was found between hypertension or previous cerebrovascular attacks and survival following stroke.

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

- 449 High Molecular Weight Pigment in Cigarette Smoke. R. L. Stedman, W. J. Chamberlain, and R. L. Miller. Chem. Ind. (London). No. 37, 1560-1562 (Sept. 10, 1966).

It is suggested that the occurrence of a high molecular weight pigment found in cigarette smoke is related to the observed tumorigenic activity of smoke in animals. A comparative summary of the major properties of the tobacco leaf and smoke pigments is given. There are 13 references.

-- Public Health Eng. Absts.

- 450 Death From Respiratory System Disease Among Seventh-Day Adventist Men. F. R. Lemon and R. T. Walden. J. Am. Med. Assn. 198, 137-146 (Oct. 10, 1966).

The findings from this study are consistent with previous epidemiologic studies and with predictions of a large reduction in lung cancer in any non-smoking United States population. The findings support the causal relationship of cigarette smoking to lung cancer, but discount the "selection or constitutional" theory. There are 40 references. -- Public Health Eng. Abst.

- 451 A Review of Some Important Problems Concerning Lung Cancer. Part II. The Importance of Complete Preoperative Assessment in Bronchogenic Carcinoma. N. C. Delarue and J. Starr. Can. Med. Assn. J. 96, 8-20 (Jan. 7, 1967).

Part I (Can. Med. Assn. J. 84, 1374 (1961)) of this review described the pathogenesis of lung cancer and emphasized that it was largely a preventable disease. In the present paper, attention is drawn to the prevalent but false impression that treatment of established disease is quite ineffective. In eight consecutive series of cases (over 2,300 patients) the authors have seen a change in the clinical environment in which lung cancer is treated — from one of discouragement and apathy to one of outspoken encouragement and enthusiasm. Complete preoperative assessment — an evaluation of the biology of the tumor-host relationship as well as technical resectability — avoids unnecessary surgical intervention and stimulates a trend to earlier referral. This has permitted increasing use of resection with a declining mortality and a continuing improvement in overall survival. On the basis of present resectability rates (37.5%) and a 39% five-year survival rate in those who have had curative resection, it is estimated that current overall five-year salvage should exceed 13%. This is more than a five-fold increase in survival for all patients compared to that achieved by treatment before 1952. There are 29 references. -- Authors' abst.

- 452 Human Trichinosis: Report of Four Cases, With Emphasis on Central Nervous System Involvement, and a Survey of 500 Consecutive Autopsies at the Ottawa Civic Hospital. R. Barr. Can. Med. Assn. J. 95, 912-917 (Oct. 29, 1966).

Four patients with acute trichinosis, two men and two women, are described; all became ill after eating contaminated pork. The two men were affected minimally. The two women were acutely ill and had the clinical signs and symptoms of central nervous system and myocardial involvement. A dramatic response followed the institution of corticosteroid therapy, and three of the four are now perfectly well and symptom-free. One of the women has perineal and vaginal anesthesia which dates from the acute illness. The main features of the myocardial and central nervous system involvement are discussed in detail. In 500 diaphragms from cadaver specimens examined at the Ottawa Civic Hospital the infestation rate was 0.8%. Special reference is made to the public health regulations regarding treatment of garbage, inspection of premises

and the correct cooking of pork and pork products. Attention is also drawn to the paramount importance of a muscle biopsy in the diagnosis of trichinosis, especially in view of the frequent occurrence of negative skin and latex fixation tests, and the absence of eosinophilia in overwhelming clinical infestations. There are 15 references. -- Author's summary

- 453 Immunization Against Rabies. R. S. McWilliam and J. L. Penistan. *Can. Med. Assn. J.* 96, 153-157 (Jan. 21, 1967).

The methods used for both pre-exposure and post-exposure immunization against rabies were studied. In pre-exposure immunization duck embryo vaccine should be used. In post-exposure immunization either duck embryo or Semple-type vaccine appears to be effective in stimulating antibody production. Both vaccines may cause neurological sequelae. A dose of vaccine should be given 20-50 days after completion of the primary course of vaccination. Immune serum should be used in all severe exposures especially of the head and neck, and in individuals in whom the commencement of vaccination has been unduly delayed. In individuals who have been previously vaccinated reinforcing doses have been found to be effective even as long as 20 years after the primary vaccination. A tissue culture vaccine has been developed and is about to undergo field trials. There are 19 references. -- Authors' abstr.

- 454 Trichinosis. Report of a Small Outbreak with Observations of Thiabendazole Therapy. W. J. Hall III and W. R. McCabe. *Arch. Internal Med.* 119, 65-68 (Jan. 1967).

A limited outbreak of trichinosis involving four individuals, originating from a common source, is described. Histologic confirmation was not obtained, but serologic tests were positive in all patients. Three of the patients were treated with a new antihelminthic, thiabendazole (Mintezol). Although clinical improvement appeared to result from thiabendazole, further evaluation of this agent is necessary. Prevention, rather than therapy, of trichinosis still appears to be the most effective method of control. There are 18 references. -- Authors' summary

- 455 Industrial Inhalation of Anthrax. P. S. Brachman, A. F. Kaufmann, and F. G. Dalldorf. *Bacteriol. Rev.* 30, 646-659 (Sept. 1966).

Exposure of 91 monkeys to naturally produced aerosols containing *B. anthracis* resulted in an anthrax fatality rate of 25.3%. The pathological findings were similar to findings in animals after acute exposure to pure aerosols of *B. anthracis*, and also to the findings in humans who have developed fatal inhalation anthrax after industrial or sporadic exposure. With the low-dose chronic exposure to natural aerosols, the incubation period appears to range from 5 to 17 days. There are 38 references. -- Public Health Eng. Absts.

- 456 Dr. Samuel Johnson's Emphysema. L. C. McHenry, Jr. *Arch. Internal Med.* 119, 98-105 (Jan. 1967).

In the detailed record of Dr. Samuel Johnson's (1709-1784) illness, most of the salient features of chronic pulmonary emphysema are described: chronic or intermittent cough for many years; chronic dyspnea with intermittent exacerbations described as asthma; and chronic heart failure of the right side or cor pulmonale. Johnson's illness extended over a period of 11 years in an era prior to bronchial dilators, expectorants, antimicrobials, oxygen, diuretics, and positive pressure breathing devices. "This should serve as a note of caution about attributing lengthy survival in present-day emphysema patients entirely to the effect of modern therapy." There is both clinical and pathological evidence that Dr. Johnson's difficulty in breathing for nearly 20 years was due to chronic bronchitis with pulmonary emphysema. The detailed medical history of Johnson's illnesses is unique for this period with probably more clinical information available on this 18th century scholar than is obtained on most patients today. There are 12 references.

#### SKIN DISEASES AND BURNS

- 457 Laboratory-Acquired North American Blastomycosis. J. F. Denton, A. F. DiSalvo, and M. L. Hirsch. *J. Am. Med. Assn.* 199, 935-936 (March 20, 1967).

A female laboratory assistant probably acquired blastomycosis while handling cultures of the mycelial form of *Blastomyces dermatitidis*. Following her presumed inhalation of conidia, she experienced no pulmonary symptoms. The first indication of infection was the appearance of an osteolytic lesion in the head of the right fibula and an associated soft-tissue abscess. Incision and drainage of the area were performed, and *B. dermatitidis* was demonstrated in histologic sections and on cultures of the tissue removed. Skin tests performed with blastomycin

and a whole yeast antigen at the time of diagnosis were negative. Another skin test seven months later, utilizing an autogenous whole yeast antigen, was positive. Complement fixation tests performed on pretreatment and posttreatment sera were negative. Following therapy with 1,870 mg of amphotericin B, she has been well for 2 1/2 years. This case offers additional evidence that asymptomatic primary pulmonary infections with *B dermatitidis*, subsequently resulting in dissemination, may occur. The question is again raised as to whether cutaneous blastomycosis might result from the inoculation of the saprophytic form of the fungus into the skin. There are eight references.

-- Authors' summary

- 458 A Clinical Trial with Dimethyl Sulfoxide in Scleroderma. D. L. Tuffanelli.  
Arch. Dermatol. 93, 724 (1966).

In view of enthusiastic reports concerning the use of dimethyl sulfoxide in scleroderma, a clinical trial with this agent was carried out. Twenty-four patients with systemic scleroderma were treated with local applications of 90% dimethyl sulfoxide, with or without 0.025% triamcinolone. Under the conditions of this study, no improvement of any of the parameters studied was noted.

- Can. Med. Assn. J. Absts.

- 459 Toxic Epidermal Necrolysis: The Scalded Skin Syndrome. J. P. Anderson and D. A. Hillman.  
Can. Med. Assn. J. 95, 1076-1080 (Nov. 19, 1966).

Toxic epidermal necrolysis is a condition that may occur in all age groups and resembles skin scalding. It presents as a generalized, markedly tender erythema and rapidly progresses to bullous desquamation of the superficial epidermal layers and systemic toxicity. The condition was first described in 1956. A review of the recent literature suggests that the incidence of the syndrome is increasing or it is being recognized more frequently. Its etiology has not been established, but it may represent unusual hypersensitivity to drug, bacterial, viral or immunization factors. The mortality rate in reported cases is approximately 30% and young children and debilitated adults are at greatest risk. Recently, two children with this condition were successfully treated at the Montreal Children's Hospital, using protective isolation, intensive nursing care, intravenous antibiotics and hydrocortisone hemisuccinate. Early use of corticosteroids may inhibit the progression of epidermal necrolysis and improve the prognosis. There are 26 references.

-- Authors' abst.

- 460 Cleansing Agents: A Review of Several Investigations Concerned with Skin Effects and Cleansing Efficiency. I. L. Beauchamp.  
Am. Ind. Hyg. Assn. J. 28, 31-38 (Jan.-Feb. 1967).

The historical background of the development, concepts and applications of various skin cleansers is reviewed. The factors of physiologic effects on skin, efficiency of cleansing, and testing of irritancy and sensitization are discussed. Some areas of need for future investigations are cited. There are 32 references.

-- Author's abst.

- 461 Treatment of Severe Burns with Aqueous Silver Nitrate (0.5%). H. C. Polk.  
Ann. Surg. 164, 753 (1966).

The use of Ringer's lactate solution intravenously and 0.05% silver nitrate locally to treat burns in a general hospital with no special burn unit appeared to reduce mortality and morbidity, result in less wound sepsis and give acceptable functional and cosmetic results. The rate of the intravenous was determined by maintaining urinary output at 20 ml per hour. Tracheotomy was discouraged, but high humidity oxygen was used when the burn was inflicted in a confined space or involved the face. Nasogastric suction was used in large area burns or if nausea or emesis occurred. The wound was cleansed, blisters were removed, and the dilute silver nitrate dressings were kept moist. When dull, flat granulation tissue appeared, grafting was performed at frequent intervals under infiltration anesthesia. Tetanus immunization, high calorie diets, iron, vitamins, sodium chloride, potassium gluconate and calcium lactate by mouth supplemented the treatment. Antibiotics were given only for specific reasons. Active use of the injured parts was encouraged from the start. The use of stamp grafts made immobilization unnecessary. The treatment was not complicated by pulmonary edema or renal deficiency. Children required greater volumes than adults. Staphylococcus and Pseudomonas infections appeared in a few of the burned patients, and the importance of early treatment is emphasized. Others died of aspiration or pneumonia. Anemia occurred in a sporadic fashion without correlation to age, burn size or chronicity. Pre-existing diseases like alcoholism, hypertension, pulmonary emphysema, diabetes, cerebral and peripheral arterial disease and insanity prejudiced the chances of recovery. Silver nitrate solution is defended as the local treatment of choice.

-- Cond. from Can. Med. Assn. J. Absts.

- 462 Treatment of Malignant Melanomas of the Skin. F. V. Nicolle, W. H. Mathews, and J. D. Palmer. *Arch. Surg.* 93, 209 (1966).

Resulting from a study of 150 cases with five-year follow-up, the authors present a classification of malignant melanomas of the skin based on the depth of invasion of the primary lesion. Stage 1 is a histologically malignant melanoma confined to the epidermis and junctional area. Stage 2 lesions show invasion not extending beyond the superficial sweat glands. Stage 3 shows invasion into the deeper dermis and underlying tissues. This classification is applied only to cases in which there is no clinical evidence of metastases and is used to determine which tumors should be treated by wide local excision and which by prophylactic node dissection. Local excision of stage 1 and 2 lesions resulted in 94% and 86% five-year cures respectively. The survival rate for stage 3 lesions was 52%. Recent experience with chemotherapy for malignant melanoma with involved nodes has not shown statistically significant improvement with this addition to surgical treatment. For recurrent lesions, local excision may be useful and regional perfusion has given some good temporary results. -- *Can. Med. Assn. J. Absts.*

- 463 Cryogenic Temperature Studies of Human Skin. S. A. Zacarian and M. I. Adham. *J. Invest. Dermatol.* 48, 7-10 (Jan. 1967).

Thermocouples were inserted at 2 mm skin depth in a patient under spinal anesthesia. Q tips saturated with liquid nitrogen were applied on a cutaneous surface, while temperatures were recorded on a potentiometer at the subcutaneous level. Despite successive applications of Q tips, skin temperature neither dropped below -26°C. (-14.8°F.) nor sustained. Single applications of copper cylinder disks of varying diameters, cooled in liquid nitrogen, produced subcutaneous temperatures from -30°C. (-22°F.) to -75°C. (-103°F.), and sustained for 150 seconds. During the past 17 months cooled copper cylinder disks were used for the eradication of 218 cutaneous basal cell and 27 epidermoid carcinomas. -- *J. Am. Med. Assn. References & Reviews*

#### CHEMICAL HAZARDS

- 464 A Colorimetric Method for the Determination of Oxides of Nitrogen. G. Norwitz. *Analyst* 91, 553-558 (Sept. 1966).

A colorimetric method for determining oxides of nitrogen from initiating compositions is described based upon absorption of the gases into sulfuric acid to form nitrate and nitrite, followed by the addition of iron (II) sulfate to form a pink color. The range of the method is 0.005 to 5% of oxides of nitrogen, calculated as nitrogen dioxide. There are 23 references.

-- *Public Health Eng. Absts.*

- 465 Effect of Nitrogen Dioxide on Resistance to Respiratory Infection. R. Ehrlich. *Bacteriol. Rev.* 30, 604-614 (Sept. 1966).

In laboratory animals acute and chronic exposures to nitrogen dioxide reduce resistance to infection produced by respiratory challenge with airborne *Klebsiella pneumoniae*. There are 30 references.

-- *Public Health Eng. Absts.*

- 466 Specific Spectrophotometric Determination of Ozone in the Atmosphere Using 1,2-Di(4-Pyridyl) Ethylene. T. R. Hauser and D. W. Bradley. *Anal. Chem.* 38, 1529-1532 (Oct. 1966).

Atmospheric ozone reacts with a solution of 1,2-di(4-pyridyl) ethylene in glacial acetic acid to form an ozonide which cleaves to yield pyridine-4-aldehyde. This product may be determined by a simple spectrophotometric technique and the pyridine-4-aldehyde may be used for calibration. There are 10 references.

-- *Public Health Eng. Absts.*

- 467 Arsenicals in Biology—Retrospect and Prospect. Trace Elements in Nutrition. D. V. Frost. *Federation Proc.* 26, 194-208 (Jan.-Feb. 1967).

The following general conclusions seem consistent with the experimental facts and with the vast literature on arsenic in biology: (1) There appears to be an arsenic cycle in nature. The complete ubiquity of As and its relation to phosphorylation suggest that it may catalyze energy-transfer reactions. Such a role would fit the capacity of certain arsonic acids to improve feed efficiency in poultry and swine, as well as the apparent alternative and tonic effects of inorganic arsenicals in man. (2) Arsenic, a most reactive and versatile element, is associated in biology with phosphorus, selenium, and sulfur. Although arsenicals are by far the most

potent agents to counteract Se toxicity, this effect depends on the level of each. The toxicity of Se and of As has been confused at times, as in the British Beer Poisoning of 1900 leading to lasting misrepresentation. (3) Arsenicals differ widely in toxicity. Trivalent arsenicals, which specifically block lipoate dependent enzymes, are generally more toxic than pentavalent arsenicals. The fact that calcium arsenate proved more toxic than arsenic trioxide in some studies indicates the hazard of generalizations about arsenic. (4) All arsenicals appear to have a measure of toxicity, at which the level of As in vital tissues reaches a critical point, i.e., about 1 ppm As in avian and mammalian muscle. Arsenicals are noncumulative at tolerated levels. Biological half-lives of arsenicals measured range from 36 to 60 hours. (5) The blanket term, arsenic, is inappropriate. Most of the legal limits or bans against safe uses of arsenicals have no basis in toxicology and no demonstrable relation to protection of public health. We still need to learn optimum levels of various forms of arsenic in nutrition. Optima for many arsenicals may prove to be higher than 1 ppm of total dietary As for most species. (6) Pre-occupation with hypothetical hazards from traces of arsenic in foods has often obscured attention to elements, such as cadmium and lead, which tend to accumulate and to cause chronic injury. This trend is seen in the higher official residue tolerances for Pb than for As. Research is needed on the apparent capacity of arsenic in lead arsenate to decrease retention and improve tolerance to lead. (7) The relation of P and of Se to dental health may involve a hitherto unsuspected value of arsenicals to maximize integrity of teeth and of bone. The reported cariogenicity of Se may be related as much to inadequate intake of As as to excessive intake of Se. (8) Arsenicals appear remarkably free from carcinogenicity. Allegations by Paris in 1820 and Hutchinson in 1887, plus the natural association of arsenic with soot, tar, and fossil fuels, led physicians over the years to indiscriminately accept the idea of arsenic cancer. About 35 tests of arsenicals for carcinogenicity, or co-carcinogenicity, have proved negative. The inadequacy of the charge against inorganic arsenite therapy in man has been carefully traced. Arsenicals appear to have value against cancer and this deserves study. There are 148 references.

-- Author's summary

- 468 Biological Role of Chromium. Trace Elements in Nutrition. W. Mertz  
Federation Proc. 26, 186-193 (Jan. -Feb. 1967).

It is believed that the evidence presented in this paper classifies trivalent chromium as a trace element essential for normal function of carbohydrate metabolism. The question of essentiality for life in the strict nutritional sense is not resolved as yet, because no diet and environmental control has been found which allows the total exclusion of the element from experimental animals. The chromium content of dietary ingredients can be expected to vary according to source and season; airborne contaminants depend on the location and operation of air-circulating equipment, and significant amounts of chromium from containers can contaminate dietary components. With the use of a strictly controlled environment and with application of sensitive analytical procedures to dietary ingredients, further progress can be expected. However, with the rigorous exclusion of chromium, other micronutrients not yet recognized as essentials may also be reduced or excluded from the animals, and subsequent chromium supplementation may lead to a trace-element imbalance. The life of modern man in an industrial environment and the increasing use of processed food has led to a change in the balance of trace elements, over-exposure to some and diminished availability of others. The data discussed in this report are but one example of how a suboptimal supply of a micronutrient can lead to slight, initial changes which, over a lifetime, may develop into more severe symptoms. Chromium is only one of many factors possibly related to the increase of diabetes and diseases connected with it. The possible etiological role of an imbalance of trace elements, particularly of those with hitherto little defined functions, appears to be a question of major importance in modern nutrition research. There are 79 references.

-- Cond. from author's conclusion

- 469 Iron Pentacarbonyl: Its Toxicity, Detection, and Potential for Formation. R. S. Brief,  
R. S. Ajemian, and R. G. Confer. Am. Ind. Hyg. Assn. J. 28, 21-30 (Jan. -Feb. 1967).

Advancements in iron catalyst systems have prompted an investigation of the formation potential of iron pentacarbonyl and of methods for its detection. This paper describes an inexpensive sampling and analysis technique. An analysis of the thermodynamics associated with iron pentacarbonyl formation is also presented to show the maximum concentration of iron pentacarbonyl that may be found over a wide range of carbon monoxide concentrations, temperatures, and pressures. The toxicity of this compound is reviewed, and recommendations are made for exposure limits in the environment. Eight references are given.

-- Authors' abst.

- 470 The Morbidity Among Underground Workers of Mercury Mines. N. A. Alterman and S. F. Sorokina. *Gigiena i Sanit.* 31, No. 7, 32-35 (1966). Russian.

The authors studied the morbidity among the workers of mercury mines from 1961 to 1963. There was a high per cent of incidence of bronchitis, often in combination with lung emphysema. When dust control measures were taken, the dust content of the air in mines fell sharply and the silicosis incidence decreased. There are 8 references. -- Public Health Eng. Absts.

- 471 An Unusual Case of Mercury Poisoning. H. R. M. Johnson and O. Koumides. *Brit. Med. J.* 1, 340-341 (Feb. 11, 1967).

Poisoning by metallic mercury is rare but recently cases have followed accidents during gas analysis procedures where mercury was used as a seal. The literature on metallic mercury poisoning for the past 70 years is reviewed and a further fatal case of suicidal self-injection of mercury is reported. The long-held belief that metallic mercury is nontoxic when introduced into the human body may be untrue. -- J. Am. Med. Assn. References & Reviews

- 472 Self Administration of Mercury by Subcutaneous Injection. D. M. Hill. *Brit. Med. J.* 1, 342-343 (Feb. 11, 1967).

A case report is presented of a 21-year-old diabetic female who injected 20 gm to 40 gm of metallic mercury into two subcutaneous sites in her thighs. A maximum blood mercury level of 180 micrograms/kg blood, and urine of 270 micrograms/liter were observed, both falling to normal after block excisions of the metal under dimercaprol cover was performed. No clinical features of either acute or chronic mercury poisoning developed.

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

- 473 Diethyldithiocarbamate Therapy of Thallotoxicosis. F. W. Sunderman, Jr. *Am. J. Med. Sci.* 253, 209-220 (Feb. 1967).

Sodium diethyldithiocarbamate (dithiocarb) was employed in the therapy of an 18-year-old woman with thallotoxicosis. Oral administration of dithiocarb in daily dosage of 30 mg/kg body weight produced 2 1/2 - 3-fold increase in the urinary excretion of thallium without significant alteration in the fecal excretion of thallium. In comparison, intramuscular administration of dimercaprol, 15 mg/kg daily, was ineffective in producing thalliuresis. Dithiocarb therapy was attended by improvement in the patient's neurological status as manifested by increased visual acuity and muscular coordination. -- J. Am. Med. Assn. References & Reviews

- 474 Nutritional Metabolic Role of Zinc. Trace Elements in Nutrition. A. S. Prasad. *Federation Proc.* 26, 172-185 (Jan.-Feb. 1967).

A syndrome characterized by growth retardation and testicular hypofunction, affecting males in Iran and Egypt, has been related to deficiency of zinc. Evidences for this included a decreased zinc content of plasma, red cells and hair, a rapid plasma zinc 65 turnover rate, decreased 24 hour exchangeable zinc pool, and decreased excretion of zinc 65 in stool and urine following intravenous injection of zinc 65. The urinary excretion of stable zinc was also decreased. Oral administration of zinc resulted in acceleration of growth rate, appearance of secondary sexual characteristics, and enlargement of external genitalia. It is believed that the main factors responsible for this deficiency were (1) poor availability of zinc from the subjects' predominantly cereal diet, and (2) loss of zinc due to excessive sweating and blood loss caused by hookworm infection. Zinc is known to be an essential component of several metalloenzymes. It is believed that one of the mechanisms by which the level of zinc in cells controls the physiological process is through the formation of zinc-sensitive enzymes. This hypothesis is supported by the author's recent observations that in zinc-deficient rats, the zinc content and the activities of several metalloenzymes are reduced in the bones and the testes. Deficiency of zinc produces testicular atrophy and growth retardation with remarkable consistency in various animal species and man, thus the above observations are of great interest. It is believed that the growth depression associated with deficiency of zinc in rats is not mediated through growth-hormone activity or production. Growth hormone was unable to stimulate growth in zinc-deficient hypophysectomized rats. These observations indicate that both growth hormone and zinc affect growth by independent mechanisms. Certain evidences indicate that the earliest metabolic "lesion" in zinc-deficient cells is the failure of RNA synthesis followed by decreased formation of protein, total nitrogen, and DNA. Zinc may be necessary to protect RNA from being destroyed by RNAase inasmuch as this enzyme is inhibited by zinc. It is conceivable

that growth hormone regulates the rate of synthesis of mRNA by affecting RNA polymerase whereas zinc exerts its action mainly by inhibiting the enzyme RNAase. Further work is necessary to clarify the mode of action of zinc in growth. The metabolic role of zinc in plants, animals, and human subjects, the availability of zinc from foodstuffs, and its toxic manifestations have been presented briefly in this review. There are 84 references.

-- Author's summary

- 475 Lead Poisoning From Drinking Soft Water. A. P. C. Bacon, et al.  
Lancet 1, 264-266 (Feb. 4, 1967).

Three cases of lead poisoning are described, in one of which the diagnosis had been missed for 12 years. In each instance the cause was long-term ingestion of soft water which contained eroded lead from the inside of lead pipes bringing water to their houses. Two main points emerged from these three cases: lead poisoning can still occur as a result of drinking soft water, and the diagnosis can easily be missed unless this possibility is borne in mind.

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

- 476 Evaluation and Use of Mosquito Repellents. I. H. Gilbert.  
J. Am. Med. Assn. 196, 253 (1966).

Topical repellents used on the skin and clothing have played an important part in protecting persons from mosquito attack where other methods of obtaining relief from annoying or dangerous insects are not feasible. The ideal repellent has not yet been discovered, but diethyltoluamide (deet) comes the closest. All potential repellents are screened against caged Aedes aegypti. Promising compounds are then tested by applying them to the forearms of human subjects. The arms are exposed for short periods at fixed intervals to caged mosquitoes in the laboratory or continuously to natural conditions in the field. Data obtained are statistically analyzed, the effects of several factors inherent in such tests being taken into account. Evaluating a promising repellent has involved tests against as wide a variety of species as possible in Alaska, Panama and intermediate latitudes under normal temperatures as well as conditions producing severe sweating. Normally much of the repellent is lost by being rubbed off on the clothing or other objects, so tests to determine the resistance of a repellent to removal by contact with clothing or other surfaces constitute an important part of the evaluation. For skin application, the better repellents are deet, chlorodiethyl benzamide, ethyl hexanediol, dimethyl phthalate, dimethyl carbate and butopyronoxyl. Butylethyl propanediol, ethyl hexanediol and deet are effective in making clothing mosquito-repellent.

-- Can. Med. Assn. J. Absts.

- 477 Toxic Substances and Ecological Cycles. G. M. Woodwell.  
Scientific Am. 216, 24-31 (March, 1967).

The accumulation of persistent toxic substances in the ecological cycles of the earth is a problem to which mankind will have to pay increasing attention. It affects many elements of society, not only in the necessity for concern about the disposal of wastes but also in the need for a revolution in pest control. We must learn to use pesticides that have a short half-life in the environment—better yet, to use pest-control techniques that do not require applications of general poisons. What has been learned about the dangers in polluting ecological cycles is ample proof that there is no longer safety in the vastness of the earth.

- 478 Distribution and Excretion of Niobium Following Inhalation Exposure of Rats. R. G. Thomas, R. L. Thomas, and J. K. Scott. Am. Ind. Hyg. Assn. J. 28, 1-7 (Jan.-Feb. 1967).

Two single-exposure inhalation studies on rats were carried out for the purposes of following the excretion and tissue distribution patterns of niobium with time, using niobium-95 as a radioactive tracer. For the first exposure the aerosol was generated from an oxalic acid solution containing only the tracer; for the second, the solution contained an additional quantity of stable niobium-93. Twice as much of the carrier aerosol was initially deposited in the whole animal, but only one-half as much of this larger particulate material was initially associated with the lower respiratory tract. One repeated exposure experiment was carried out, and the pattern of buildup and loss of niobium-95 from the whole body indicated that the hazard from chronic inhalation of this material could be assessed from calculations based on data derived from a single exposure. There are 11 references.

-- Authors' abst.

## INDUSTRIAL DUSTS

- 479 Lignite and the Derived Steam-Activated Carbon. The Pulmonary Response to Their Dusts.  
P. Gross and C. A. Nau. Arch. Environmental Health 14, 450-460 (March, 1967).

The pulmonary response to two dusts of respirable size, one consisting entirely of lignite and the other, a derived commercial steam-activated carbon used as an adsorbent (DARCO), was investigated on four species of animals: monkeys, guinea pigs, rats, and mice. The pulmonary response to both dusts in all four animal species was "benign," that is, the response was of the type which classifies both dusts as inert. No significant difference was noted in the response to the two dusts. An inert dust is defined as one which produces a pulmonary response having the following features: (1) collagenization is absent or insignificant in the reacting lung tissue; (2) there is continued anatomic integrity of the air spaces in spite of the presence of dust in the latter; (3) the lesions are potentially reversible. The pulmonary reactions observed in the experimental animals exposed to both dusts fulfill the above requirements. The lack of fibrogenicity, in spite of a relatively high content of free crystalline silica, of the steam-activated carbon dust is explained on the basis that the silica is prevented from contacting tissue cells by a coating or carbon applied to its surface. The dust foci consist of air spaces containing closely packed, dust-filled alveolar cells around which the mural structures are strongly contracted. Such alveoli are commonly smaller than normal. They are predominantly situated in the proximal portions of the pulmonary racemus and are therefore often found near vessels and air passages. The alveolar membrane reacts to the presence of the dust by a multiplication and enlargement of its lining cells, associated with thickening and increased arborescence of its reticulin framework. Exceedingly little dust is carried to the interstitial tissues about vessels or bronchi and very little dust is found in satellite lymph nodes. Inasmuch as the dust is relatively nontoxic and therefore almost entirely intracellular, the finding is in accord with the concept that only extracellular dust particles are capable of interstitial or lymphatic translocation. Some interesting species-linked peculiarities in the character of the pulmonary response to the dusts have come to light during this investigation. These include the development of lipid pneumonia in rats, and the paucity of pulmonary dust deposits in mice. The last is thought to be the result of an extraordinarily efficient alveolar clearance mechanism in mice.

-- Cond. from authors' summary

Reprints available from the Industrial Hygiene Foundation upon request.

- 480 Coagulation in Ten-Micron Aerosols. E. O. Knutson, K. W. Pontinen, and L. W. Rees.  
Am. Ind. Hyg. Assn. J. 28, 83-89 (Jan.-Feb. 1967).

This study was conducted to determine the coagulation rate of a freshly disseminated powder aerosol in the 10-micron size range when exposed to turbulent mixing conditions. A theoretical model was developed in which Smoluchowski's coagulation theory was extended to particles in the 10-micron size range by taking settling into account. Experiments were conducted in a chamber of 1 cubic meter with a binary aerosol composed of cornstarch and spray-dried saccharin particles. This approach was used so that agglomerates that failed to break up in the dissemination process could be distinguished from agglomerates formed in the aerosol state. The powders were pneumatically disseminated, stirred, and allowed to settle on glass microscope slides for subsequent counting. Binomial statistics were used to establish that the agglomerates were formed by random coagulation. The value of the coagulation coefficient was determined to be  $3.6 \times 10^{-5} \text{ cm}^3/\text{sec}$ . Five references are given. - Authors' abst.

- 481 The Accuracy of Dust Exposure Estimates Obtained from Conventional Air Sampling.  
A. J. Breslin, et al. Am. Ind. Hyg. Assn. J. 28, 56-61 (Jan.-Feb. 1967).

An intensive three-day study was performed at a uranium fabrication plant to determine the accuracy of measuring average occupational exposures by conventional air sampling. Statistical evaluation of the sample data indicated that accurate measurements of average exposures were obtained by conventional sampling, that the measurement precision error of individual samples was about 20%, and that most sample groups fitted either normal or log-normal frequency distributions. The errors associated with measuring average exposures are discussed, including reference to the significance of log-normal distributions of air sample data. There are 7 references. - Authors' abst.

HVBB-0020142

IN RE: AIRAIDS November 1992

- 482 Simplified Method for Determining Cascade Impactor Stage Efficiencies. J. C. Couchman and H. M. Moseley. *Am. Ind. Hyg. Assn. J.* 28, 62-67 (Jan.-Feb. 1967).

A direct method has been devised for measuring cascade impactor stage efficiencies. The method makes use of a special two-stage configuration of the sampler being calibrated. To employ the method, it is necessary only to measure the unnormalized density function of the source and the unnormalized density function of the particles collected on the second of two identical impactor stages. With this method, an impactor stage can be calibrated in a few hours.

- Authors' abstr.

- 483 The Mineral Content of Bituminous Coal Miners' Lungs. J. V. Crable, et al. *Am. Ind. Hyg. Assn. J.* 28, 8-12 (Jan.-Feb. 1967).

Lung samples from 30 bituminous coal miners have been analyzed for coal and noncoal dust. The latter has also been analyzed for quartz, other crystalline substances, and metallic constituents. Initially, the sample is freeze dried, and ground in a mullite ball mill, and suitable aliquots are then digested by the King and Gilchrist procedure. Following the destruction of the lung matrix, the total dust is determined gravimetrically. The loss obtained on igniting the total mineral residue at 380°C represents the weight of the coal fraction. The resulting non-coal residue is then aliquoted for the determination of quartz and for the identification of other crystalline substances by x-ray diffraction. The analysis for the metallic constituents is accomplished by emission spectrography. Particle size analysis of the noncoal fraction is conducted by an electron microscopic procedure. Seven references are given.

- Authors' abstr.

- 484 On the Carcinogenic Effect of Asbestos Dust. F. M. Kogan, et al. *Gigiena i Sanit.* 31, No. 8, 28-33 (1966). Russian.

When the death rate from lung cancer between 1953 and 1962 was compared among asbestos workers, the town population, and the Sverdlovsk region population, the rate among workers was three times that of town dwellers and the rate of the town dwellers was two times that of the general population of the region. The possible causes of increased mortality among those inhaling asbestos dust are discussed. There are 27 references. -- Public Health Eng. Absts.

#### PHYSICAL ASPECTS OF THE ENVIRONMENT

- 485 Content and Turnover of Water in Bantu Miners Acclimatizing to Humid Heat. W. V. MacFarlane, et al. *J. Appl. Physiol.* 21, 978-984 (May, 1966).

Water content averaged 77% of body weight initially. This fell while average weight increased during exposure to heat. There was no general increase in water turnover during acclimatization. Those subjects in whom body temperature was well controlled, increased water turnover, whereas those with oral temperatures frequently above 101°F during work, decreased turnover by 11%. There are 19 references.

-- Public Health Eng. Abstr.

- 486 A Test of the Effectiveness of Acclimatization Procedures in the Gold Mining Industry. C. H. Wyndham, et al. *J. Appl. Physiol.* 21, 1586-1588 (Sept. 1966).

The test comprises a 4-hour exposure at 90°F (with the air almost saturated with water vapor) at an air velocity of 80 ft/min, and oxygen consumption of 1 liter/min (5 cal/min). A statistical technique, based upon the standard deviations of rectal temperatures, heart rates, and sweat rates, is presented for judging the results. The test has been applied where laborers are acclimatized for service in the gold mining industry, and the results indicate its effectiveness for this purpose. There are 6 references.

-- Public Health Eng. Abstr.

- 487 Absolute Thresholds of Human Hearing. E. R. Hermann and B. R. Holzman. *Am. Ind. Hyg. Assn. J.* 28, 13-20 (Jan.-Feb. 1967).

Data obtained from high school students indicate that distributions of hearing thresholds determined by puretone audiometry are log-normal. A graphically simplified mathematical method for determining the loci of absolute thresholds of human hearing is presented. Sound pressure levels at which the best ear in a population first responds to stimulation are some 25 to 30 db less than median values. An elegantly simple equation is derived for determining the point of origin of a log-normal frequency distribution. The statistical method developed for this

application to audiometric data is applicable to other measurements and is especially useful when the physical parameter is relative rather than absolute, as with sound measured in decibels. Implications of these findings in relation to audiometry, communications, and compensation for hearing loss are mentioned and briefly discussed. Eight references are given.

-- Authors' abst.

- 488 Shifts in the Functional State of Thermal Analyzer in Workers Exposed to Infrared Radiation. N. A. Kokhanova. *Gigiena i Sanit.* 31, No. 6, 20-23 (1966). Russian.

Because of the comparably low air temperature (19° to 23°C, 66.2 to 73.4°F) and ventilation of working sites at the forge-stamping shop, the skin temperature of different areas (chest, forearm) of the body of persons working at ovens was slightly lower than that of persons performing "cold" work. The perspiration intensity, the decrease of the latent period in reaction to thermal stimulation, and a rise of sensitivity to thermal stimulation, however, were much more pronounced than in workers who were not exposed to the action of infrared radiation during work. There are 12 references.

-- Public Health Eng. Absts.

- 489 Hazards of Laser Radiation: Mechanisms, Control and Management. M. S. Litwin, et al. *Am. Ind. Hyg. Assn. J.* 28, 68-75 (Jan.-Feb. 1967).

Analysis of biological studies indicate the factors responsible for hazards associated with laser systems: (1) the laser radiation and its interaction with the biological system, (2) the pumping source, (3) the high voltage and current required for operation of the laser system and (4) the environment in which this system is used. Short term and long-term hazards associated with the beam are dependent on the properties of the radiation and those of the biological system. Hazards associated with flashtubes must be considered, particularly since misfire or accidental firing can occur. Long-term effects on the eyes due to either a single insult or to cumulative subthreshold insults are not yet known but continue to present a potential hazard. Hazards to the skin must also not be neglected in continued testing. There are 10 references.

-- Authors' abst.

#### RADIOACTIVITY AND X-RADIATION

- 490 Emergency Care of Maxillo-Facial Injuries. (Emergency Health Services). D. Tanner. *Can. Med. Assn. J.* 96, 219-220 (Jan. 28, 1967).

Maxillo-facial injuries require immediate first-aid for the establishment of a free airway, control of hemorrhage, and treatment of shock. The facial structures must always be supported and the patient kept in a face-downward position. Anxiety of the patient for his facial appearance is a distressing factor which must be considered in all stages of treatment. Early evacuation to an Advance Treatment Center for professional care is of prime importance.

-- Author's summary

- 491 The Dental Practitioner's Role in Emergency Health Services. C. A. E. McCabe. *Can. Med. Assn. J.* 96, 192-195 (Jan. 28, 1967).

In a national disaster, the medical profession would lose physicians and auxiliary personnel and would need assistance. Canada's 22,000 physicians and 85,000 nurses are located for the most part in potential target areas. Survivors among Canada's 6,396 dentists could supply 30% reinforcement. The dentist's training, his manual dexterity and experience acquired in the management of hemorrhage, shock, debridement, suturing, reduction and immobilization of fractures and control of pain and infection would be valuable. Additional functions he could perform would be first-aid including but not limited to artificial respiration, early management of chest wounds, preparation of casualties for movement, and assistance in general surgical procedures. Dentists with special training in anesthesia, oral surgery or public health could be of particular value in relieving anesthetists, surgeons, radiologists and public health officers of some of their duties. Joint training of physicians and dentists in mass casualty care could increase the efficiency of the teamwork in disaster and is being considered by many medical and dental faculties. There are 11 references.

-- Author's abst.

- 492 The Radioactive Contamination of Food Following Nuclear Attack. (Emergency Health Services). E. E. Massey. *Can. Med. Assn. J.* 96, 204-206 (Jan. 28, 1967).

The relative radiation hazards from early and delayed fallout following a nuclear attack have been reviewed. It is indicated that the hazard to life from whole-body gamma irradiation from

early fallout far outweighs the hazard from radioactive contamination of food. Nevertheless, because of the possible effects of iodine-131, the consumption by infants of fresh milk from animals which have ingested contaminated fodder should be avoided if possible during the first few weeks after the attack. During the same period, water from covered supplies should be used in preference to that from open reservoirs. It is more important, however, to alleviate hunger and thirst in both man and animal than to prevent the temporary ingestion of food which may be contaminated by fallout. There are 14 references. -- Author's abst.

- 493 Health Hazards Associated with the Fabrication of Plutonium-Aluminum Fuel Elements.  
P. B. Vernon. *Health Physics* 12, 1109-1113 (Aug. 1966).

A test program was conducted to assess contamination hazards and determine containment needs prior to design of Pu-Al fuel fabrication facilities. The tests, containment features developed, and operating experience are described. Operating experience has closely paralleled the results of the predesign contamination hazard tests. Radiation exposure problems have been controlled and direct handling of production components is possible. Four references are given.

-- Public Health Eng. Abst.

- 494 Perspectives of Radioactive Contamination in Nuclear War. (Emergency Health Services).  
W. R. Waters. *Can. Med. Assn. J.* 96, 200-203 (Jan. 28, 1967).

The degrees of risk associated with the medical, industrial and military employment of nuclear energy are compared. The nature of radioactive contamination of areas and persons resulting from the explosion of nuclear weapons, particularly the relationship between the radiation exposure and the amount of physical debris, is examined. Some theoretical examples are compared quantitatively. It is concluded that the amount of radioactivity that may be carried on the contaminated person involves a minor health hazard from gamma radiation, compared to the irradiation arising from contaminated areas. There are 10 references. - Author's abst.

- 495 Blast Injury. (Emergency Health Services). C. A. DeCandole.  
*Can. Med. Assn. J.* 96, 207-214 (Jan. 28, 1967).

The shock wave generated by an explosion ("blast wave") may cause injury in any or all of the following: (1) direct impact on the tissues of variations in environmental pressure; (2) flying glass and other debris set in motion by it; (3) propulsion of the body. Injuries in the first category affect gas-containing organs (ears, lungs and intestines), and acute death is attributed to air forced into the coronary vessels via damaged pulmonary alveoli. It is estimated that overpressure sufficient to cause lung injury may occur up to five miles from a 20-megaton nuclear explosion. The greatest single hazard from blast is, however, flying glass, and serious wounding from this cause is possible up to 12 miles from an explosion of this magnitude.

-- Author's abst.

- 496 The Management of Accidental Hypothermia. (Emergency Health Services).  
W. Zingg. *Can. Med. Assn. J.* 96, 214-218 (Jan. 28, 1967).

The various changes produced by a lowering of the body temperature differ from patient to patient. Even the lowest temperature compatible with life is not uniform; it depends on a number of factors. For these reasons and because in a major disaster the measurement of the rectal temperature is impractical, little consideration is given in this paper to the body temperature. From a practical standpoint the conscious hypothermia victim and the unconscious patient can be differentiated. In the former hypothermia is relatively mild and of short duration, while in the latter the temperature is lower for a longer period of time. Rewarming may spontaneously occur in both groups, but it is more likely in mild hypothermia. If the facilities are available, rapid rewarming in a water bath is the treatment of choice in the mild cases. The value of rapid rewarming in the severe cases is questionable, but it does not appear to be contraindicated. All patients need close supervision until the normal body temperature is reached and probably for some time thereafter. There are 7 references.

-- Author's summary

- 497 Management of the Acute Radiation Syndrome (Emergency Health Services).  
J. M. M. Darte and W. M. Little. *Can. Med. Assn. J.* 96, 196-199 (Jan. 28, 1967).

Classification of radiation injury on a clinical basis is useful for determining priorities of evacuation and treatment in a mass casualty situation. Victims of nuclear attack would probably also suffer traumatic and thermal injuries. Four categories of surgical injury have therefore

been combined with three categories of radiation injury to yield 12 classes of patients whose disposition is described. The treatment of the acute radiation syndrome is briefly discussed and concurrent injuries from trauma and burns and their possible implications are considered. There are 3 references. - Author's abst.

- 498 Civil Emergency Planning in Canada. J. F. Wallace.  
Can. Med. Assn. J. 96, 183-185 (Jan. 28, 1967).

The national objectives of civilian emergency planning are: (1) protection and preservation of life and property; (2) maintenance of governmental structure; and (3) conservation of resources. The Canada Emergency Measures Organization (EMO) has been developed to accomplish these objectives. EMO coordinates other departments and agencies of federal government and its organization is reflected within provincial and municipal governments. Present EMO accomplishments include: an attack warning system; an emergency broadcasting system; emergency government facilities; 400 emergency measure organizations across Canada; plans to implement general readiness; a medical stockpile; and "shadow agencies" for control of housing, food and manpower. Present undertakings include: a national survey of fallout shelters; the equipping of the radiation defence (RADEF); the pre-positioning of the items of the medical stockpile; and the training at the Canadian Emergency Measures College at Arnprior. - Author's abst.

- 499 The Employment of Emergency Medical Units of the National Medical Stockpile. W.S. Hacon.  
Can. Med. Assn. J. 96, 185-191 (Jan. 28, 1967).

Canada has a good National Medical Stockpile valued at 21 million dollars and consisting of packaged emergency medical units ready for use in peacetime or wartime disaster. These units are available for release to provinces for pre-positioning in selected communities provided that certain storage conditions are met and that physicians and other key health workers are prepared to take operational charge of the equipment. The major packaged units are the Emergency Hospital with a capacity of 200 beds, the Advanced Treatment Center with equipment to give emergency medical care to 500 casualties, the Casualty Collecting Unit with equipment to give first-aid care to 500 casualties, the Emergency Blood Depot, the Emergency Clinic and the Emergency Public Health Laboratory. In addition, training equipment, supplies and units are provided. The value of the stockpile has already been demonstrated in disasters occurring inside and outside Canada. Ten Emergency Hospitals have been shipped to South Vietnam for civilian use. A similar Emergency Hospital was flown to Yellowknife, North West Territories, within 24 hours of the destruction, by fire, of the Stanton Yellowknife Hospital in May 1966. -- Author's abst.

#### ENVIRONMENTAL MEASUREMENTS

- 500 Continuous Automatic Determination of Sulfur Dioxide in the Presence of Auto Engine Exhaust. M. Malanchuk. Am. Ind. Hyg. Assn. J. 28, 76-82 (Jan.-Feb. 1967).

A colorimetric type of instrument was used to monitor sulfur dioxide added to auto engine exhaust atmospheres produced for animal exposure studies. It shows specificity for sulfur dioxide and can make accurate determinations of sulfur dioxide that are not possible with the present conductimetric type of instrumentation applied to such exposure atmospheres. There are 10 references. - Author's abst.

- 501 Experimental Data for Hygienic Substantiation of the Maximum Permissible Concentration of Vanadium Pentoxide in the Atmosphere. V. M. Pazynich.  
Gigiena i Sanit. 31, No. 7, 8-12 (1966). Russian.

Chronic poisoning of albino rats for 24 hours with aerosols of vanadium pentoxide condensate at a concentration of 0.027 mg/cu.m. had a significant effect on the functions of the experimental animal's body and produced morphological lesions in certain internal organs. Vanadium at a concentration of 0.002 mg/cu.m. had no effect on the investigated functions of the body, and it is suggested as the daily average maximum permissible concentration of this substance in the atmosphere. There are 14 references. - Public Health Eng. Abst.

- 502 Fujiwara Reaction and Determination of Carbon Tetrachloride, Chloroform, Tetrachloroethane, and Trichloroethylene in Air. G. A. Lugg. Anal. Chem. 38, 1532-1536 (Oct. 1966).

An examination of the red color produced when halogenated hydrocarbons are heated with sodium hydroxide and pyridine is made for certain chlorinated hydrocarbons in air, employing both 2-phase and 1-phase procedures. Absorption studies of the compounds in pyridine have shown that at least 90% of the vapors can be collected in two bubblers. Data are given on the precision, accuracy, and specificity of the methods. There are 25 references.

-- Public Health Eng. Absts.

**PREVENTIVE ENGINEERING**

- 503 Control of Nitrogen Oxide Emissions from Nitric Acid Manufacturing Processes. R. W. Gerstle and R. F. Peterson. *Air Eng.* 9, 24-28, 34 (April, 1967).

In nitric acid plants the nitrogen oxides content of the effluent gas streams is usually measured to determine plant operating efficiency. In addition, oxygen concentrations are measured to check air rates to the unit. The hydrogen peroxide test is most commonly used in nitric acid plants to determine total nitrogen oxides. This method measures all of the various oxides of nitrogen except nitrous oxide ( $N_2O$ ). Nitric acid mist and vapor are also measured. Although many variations are used, this technique basically involves collecting a known volume of gas in a 2-liter glass container charged with 25 cc of 3% hydrogen peroxide solution. The container is sealed and the contents allowed to react for 30 to 60 minutes with frequent shaking of the container. The contents are then titrated to a copper-colored endpoint with standard sodium hydroxide using methyl-red indicator. A standard Orsat kit is usually used to determine the oxygen content of the tail gases. When the kit is used carefully, oxygen concentrations may be read to the nearest 0.2% by volume. There are 7 references. -- Authors' summary

- 504 Correction for Dead Space in Face Masks in Inhalation Studies. J. W. Thomas. *Am. Ind. Hyg. Assn. J.* 28, 39-42 (Jan.-Feb. 1967).

Equations for correcting experimental inhalation data for dead space in face masks have been derived. These equations take into consideration the rebreathing, on the inspiratory cycle, of that part of the previous expiration contained in the dead space volume, and also the exhalation from the mask of the contents of the dead space volume. Three references are given.

-- Author's abst.

- 505 Specialized Protective Clothing Developed at the Savannah River Plant. J. J. Croley, Jr. *Am. Ind. Hyg. Assn. J.* 28, 51-55 (Jan.-Feb. 1967).

The Savannah River Laboratory has improved the design of the following articles of protective clothing: plastic suits supplied with cooled air, air-supplied welder's hoods, cloth coveralls, laboratory coats, and shoe covers, plastic suits for rescue teams, and tear-away sleeves for work with moving machinery in areas where protective garments are required. There are 4 references.

-- Author's abst.

**COMMUNITY AIR HYGIENE**

- 506 Oxidant Air Pollution and Athletic Performance. W. S. Wayne, P. F. Wehrle, and R. E. Carroll. *J. Am. Med. Assn.* 199, 901-904 (March 20, 1967).

The effect of Los Angeles' oxidizing type of air pollution on athletic performance was studied in 21 competitive meets of high school cross-country track runners from 1959 to 1964. Since running times tend to improve throughout the season, team performance at a meet was evaluated by determining the percent of boys who failed to improve when their running time was compared to that run at the previous meet on the same course. The highest correlation to team performance is that of the oxidant level in the hour before the race. Neither carbon monoxide, temperature, nor humidity shows any relationship to performance. The specificity of the effect to a biologically meaningful time and the very high correlation are convincing evidence of a cause and effect relationship. The mechanism by which oxidants affect performance may be directly physiological or may be decreased motivation due to discomfort.

-- Authors' abst.

- 507 High-Temperature Combustion Destroys Pollutants. Anon. *Chem. Eng.* 73, 112, 114 (July 18, 1966).

Wastes provide the fuel for their own destruction in this unit that burns fluidized wastes at temperatures from 2,000° to 2,950° F. In many cases the heating values of the wastes are so high that no additional fuel is required.

-- Public Health Eng. Absts.

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## ACCIDENTS AND PREVENTION

- 508 Psychological Sequelae of Accidental Injury. A Medico-Legal Quagmire. A. M. Mann and Ellen M. Gold. *Can. Med. Assn. J.* 95, 1359-1363 (Dec. 24 & 31, 1966).

Litigation for personal injury following accidental trauma is an expensive and confused process involving three protagonists: patient, doctor and lawyer. Although post-traumatic conditions can be elaborately classified, the intrinsic validity of such classifications is often questionable. Current methods of evaluating psychological sequelae of accidental injury are inaccurate and unsatisfactory, partly because of the protagonists' conceptual, motivational and semantic differences. In addition, there is no really satisfactory method of (a) determining and quantifying minor but significant degrees of brain damage, (b) distinguishing these from "post-traumatic neurosis", or (c) determining the relationship between the trauma and subsequent disturbance of function. Increasingly "expert" advice is solicited but owing to the nature of the data and conditions of examination, such advice does little to clarify the underlying problems. Furthermore, doctors are often unable to communicate effectively to the judiciary just how the trauma has affected the patient. Even though certain suggestions for improvement are advanced, the need for comprehensive, longitudinal research is inescapable. -Authors' abst.

- 509 Death Following Injury by a Thermometer. L. Popper. *Wien. med. Wochschr.* 116, 779 (1966). German.

This is a very unusual case report. A 19-year-old student nurse injured her left hand when she was distracted by a crying child while shaking down a thermometer. The thermometer was thrown against the left hand, where it broke, causing a wound which necessitated surgical treatment. The wound healed uneventfully and the nurse apparently forgot the incident. Two years later she had several bouts of bronchitis and pneumonia. Three years after the accident the diagnosis of bronchiectases was made at bronchoscopy, and four years after the accident the left lower lobe was removed. The pathological examination of the specimen showed widespread bronchiectases, chronic interstitial pneumonia and disseminated mercury emboli in the small pulmonary arteries. Following the operation the patient was well for six months only, when fever and hemoptysis recurred. The diagnosis of a pulmonary abscess in the left upper lobe was made and a pneumonectomy of the left lung was performed. An ensuing empyema required further surgical treatment and the patient died about six years after the initial accident. The author concludes that there is a causal relationship between the introduction of a small amount of mercury intravenously and the final fatal outcome. The amount of mercury was so small that it was not possible to demonstrate its presence on radiological examination. -- Can. Med. Assn. J. Absts.

## MISCELLANEOUS

- 510 Determining Optimum Fluoride Levels for Community Water Supplies in Relation to Temperature. L. F. Richards. *J. Am. Dental Assn.* 74, 389-397 (Feb. 1967).

Dental caries and enamel fluorosis data on children 12 to 14 years old and from 18 specific fluoride-temperature zones were presented. Optimum fluoride concentrations for the three mean maximum temperature ranges are 65°F or lower,  $1.2 \pm 0.1$  ppm; 66°F to 79°F,  $0.9 \pm 0.1$  ppm; 80°F or higher,  $0.6 \pm 0.1$  ppm. Children in the same fluoride-temperature zone whose teeth show clinical evidence of fluoride have less dental caries than those whose teeth show no evidence of fluoride. Those children whose teeth showed no observable signs of fluoride had consistently lower caries experience as the fluoride level increased at a constant temperature or as the temperature increased at a constant fluoride level. This finding indicates that the beneficial effect of fluoride in caries reduction is operative and related to temperature even though its evidence in the teeth is not clinically detectable. - J. Am. Med. Assn. References & Reviews

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