

IN THE AIRS
November 1967



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Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL

JUNE, 1967
(Vol. 31, No. 6)

INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE - PITTSBURGH, PA. 15213



IN RE: ALBRAMS November 1993

SCIENTIFIC CONFERENCE — October 11, 1967

Chairman: Anna M. Baetjer, Sc.D.
Professor, Department of Environmental Medicine
The Johns Hopkins University

9:00 am Engineering Session
Moderator: Lester V. Craliev, Ph.D.
Chief Industrial Hygienist
Aluminum Company of America

9:10 am Laser Hazards and Controls in Industry (Speaker to be announced)

9:30 am Need for Hazardous Noise Control in Pennsylvania (Speaker to be announced)

9:50 am Discussion

10:30 am Legal Session
Moderator: Andrew Kalmykov, Counsel
American Insurance Association

10:40 am Local Ordinances vs. Federal Pollution Control Standards
William L. Kreutz
Manager of Industrial Relations
Owens-Corning Fiberglas Corporation

11:00 am Workmen's Compensation Progress and Problems in 1967
Andre Maisonnier
Manager, Casualty Department
American Mutual Insurance Alliance

11:20 am Discussion

12:00 noon Lunch

1:30 pm Medical and Nursing Session
Moderator: Daniel C. Braun, M.D.
Assistant Medical Director
United States Steel Corporation

1:40 pm Mental Health and the Industrial Nurse
Harris H. Shettel
Director, Instructional Development Program
American Institutes for Research

2:00 pm Curious Bodies—Facts and Fancies
John M. G. Davis, Ph.D.
Department of Pathology
University of Cambridge, England

2:20 pm Discussion

2:30 pm Chemical-Toxicological Session
Moderator: Joseph P. Trean, Ph.D.
Manager, Toxicology Section
Atlas Chemical Industries, Inc.

2:40 pm Industrial Hygiene Information Research
Allen Kent, Director
Knowledge Availability Systems Center
University of Pittsburgh

3:00 pm An Industrial Hygiene Data Repository—Progress Report (Speaker to be announced)

3:30 pm Adjournment of Conference

NWBB-0020149

TENTATIVE PROGRAM for 32nd ANNUAL MEETING

of

INDUSTRIAL HYGIENE FOUNDATION

Time: October 10-11, 1967

Place: Chatham Center, Pittsburgh, Pa.

9:00 am OPENING REMARKS
E. K. Davison
Chairman, IHF Board of Trustees and
President, Davison Sand and Gravel Company

9:10 am WELCOME TO CITY OF PITTSBURGH
Mayor Joseph M. Barr

MANAGEMENT CONFERENCE — October 10, 1967

Chairman: James H. Sterner, M.D.
Medical Director
Eastman Kodak Company

9:30 am Company-Wide Management of Environmental Health and Pollution Control
John M. Briley
Senior Vice President
Owens-Corning Fiberglas Corporation

10:15 am Coffee

10:30 am Leadership in Urban and Industrial Health
Richard A. Prindle, M.D.
Assistant Surgeon General
U. S. Department of Health, Education and Welfare
Public Health Service

11:15 am Man's Living and Working Environments—How Much Purer Need They Be?
And At What Cost?

(Speaker to be announced)

12:00 noon Lunch

1:30 pm Communicating the Effectiveness of Industry's Hazard and Pollution
Controls—Whose Job?
F. J. Solon, Jr.
Vice President
Johns-Manville Corporation

2:15 pm Value of Environmental Hazard Control Data to Industry

(Speaker to be announced)

3:00 pm Coffee

3:15 pm Automation and Employee Health Conservation

(Speaker to be announced)

4:00 pm Membership Meeting

5:30 pm Social Hour

INDUSTRIAL HYGIENE FEATURES

Is industrial medicine an art or a science? See Abst. No. 530.

Physical and mental disabilities of ordinary motorists are discussed in Abst. No. 532.

The business executive, his nervous tensions, and his periodic health examinations are reviewed in Abst. No. 533.

Abst. No. 538 investigates the relation of body weight to the development of coronary heart disease.

Abst. No. 540 reports on mule spinners' cancer and the wool industry.

Abst. No. 541 is concerned with tar and nicotine retrieval from 56 brands of cigarettes.

Skin reaction from gold jewelry contaminated with radon deposit are reviewed in Abst. No. 543.

Information on the development of allergic nickel dermatitis from earrings is given in Abst. No. 544.

Some clinical features of ayan dermatitis presented in Abst. No. 546.

See Abst. No. 552 for observations regarding the distribution of arsenic in nonexposed persons.

Abst. No. 554 discusses saturnine gout.

Abst. No. 555 is concerned with lead in the hair of children with chronic lead poisoning.

Abst. No. 556 presents environmental and clinical control of lead exposure in a non-ferrous foundry.

Dimethyl sulfoxide and experimental carcinogenesis in the hamster pouch are discussed in Abst. No. 563.

A preliminary report on convulsions in Thiodan workers is presented on Abst. No. 576.

Abst. No. 577 studies the aspects of pulmonary mechanics in arc welders' siderosis.

FOUNDATION FACTS

CARNEGIE-MELLON UNIVERSITY MERGER: Dr. Robert T. P. deTreville, Managing Director of Industrial Hygiene Foundation met with Dr. G. A. Webb, Director of Administration of Mellon Institute, Dr. F. S. Cheever, Vice Chancellor, University of Pittsburgh, and Dr. Antonio Ciocco, Acting Dean of the University of Pittsburgh, Graduate School of Public Health on June 7 to discuss ways in which the Foundation's needs may be provided for in University planning. The merger between Mellon Institute and Carnegie Institute of Technology to form Carnegie-Mellon University occurs on July 1, 1967, and the Foundation's Board of Trustees at its last meeting on May 17 authorized Mr. E. K. Davison, Chairman of the Board, and Drs. Webb and deTreville, Trustees, to consider ways in which certain of the Foundation's research, now contracted to Mellon Institute, might be contracted to the University of Pittsburgh Graduate School of Public Health, Department of Occupational Health (Chaired by Dr. David Minard). In the future, progress will be reported periodically and at the meeting of the membership on October 10.

STAFF ACTIVITIES: Dr. Paul Gross, Director of IHF Research Laboratory, participated in a Pulmonary Workshop on June 5 and 6 at the Webb-Waring Institute, University of Colorado in Denver. In Aspen, Colorado on June 7-10, Dr. Gross presented a paper, "Experimental Emphysema: Effect of Chronic Nitrogen Dioxide Exposure and of Papain on Normal and Pneumoconiotic Lungs," at the 10th Aspen Emphysema Conference. He attended the 33rd Annual Meeting of the American College of Chest Physicians (ACCP) in Atlantic City, June 16-19, and a meeting of the ACCP's Committee on Pathology and Microbiology which met during the conference.

MEETINGS: The Legal Committee met June 19 in New York to plan committee projects and discuss its part in the forthcoming 32nd Annual Meeting. At the invitation of the Chairman, Mr. Andrew Kalmykow, American Insurance Association, Dr. deTreville attended and reported on current Foundation activities.

The TENTATIVE PROGRAM for the 32nd ANNUAL MEETING to be held at Chatham Center Pittsburgh, Pa. on October 10-11, 1967 is enclosed with this issue of the Digest.

November 1967

ABSTRACTS

MWB-0020150

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November 1992

INT. IRE: AIR, AIMS

NURSING COMMITTEE MEETS TO REVIEW NIMH PROJECT



Participating in the meeting were:

(Left to Right)—Mrs. Helen Kunzler, U.S. Steel; Miss Alda Sica, U.S. Steel; Mrs. Dorothy Dean, J. & L.; Mr. Harris Shettel, AIR; Dr. Robert T. P. deTreville, IHF; Miss Margaret Bruder, Allis-Chalmers; Miss Winifred McLanahan, University of Pittsburgh Graduate School of Public Health; Mrs. Iva Pleasants, AIR

Recently, members of the Foundation's Nursing Committee met at Mellon Institute with Dr. Robert T. P. deTreville, Managing Director IHF, and Mr. Harris H. Shettel and Mrs. Iva Pleasants of the American Institutes of Research (AIR) to review developments in the important study being supported in IHF by a five-year educational training grant from the National Institute of Mental Health. In particular, AIR wished to have the Nursing Committee's evaluation of the following:

- (1) A comprehensive questionnaire intended for nurses currently working in the field of occupational health to determine present practices and attitudes concerning the mental health role of the nurse in industry.
- (2) A special form on which occupational nurses will record details of cases seen by them in day-to-day contact with workers.

As had been hoped for, the full-day session developed many useful suggestions which will result in several important changes in the above materials. Committee members also suggested ways of distributing the forms to help insure proper cooperation and a high return rate. Close liaison between the project staff and those who will eventually use and benefit from educational materials prepared in this Foundation program is desirable and is expected to help insure its success.

Details of the Foundation's program "Employee Mental Health and Occupational Health Nursing Practices" have appeared in the Digest (28, 7, pp. 1, July, 1964) and in the IHF Nursing Bulletin No. 1 in 1966. Also, the program was featured in "Notes & Quotes," a publication of the American Nurses' Association in December, 1966.

EDITORIAL

TOXICOLOGY OF CARBON DISULPHIDE

In a letter dated April 18, Dr. E. C. Vigliani, Secretary General of the Permanent Commission and International Association of Occupational Health, transmitted to us the resolutions of the International Symposium on the Toxicology of Carbon Disulphide (CS_2). They are reproduced verbatim here as a matter of general interest to the Foundation's membership:

"(1) In order to determine the amount of CS_2 in the atmosphere of a viscose rayon factory for a routine control, a method based on the reaction with diethylamine in the presence of cupric salts after removal of hydrogen sulphide (H_2S) is recommended. Detector tubes should mainly be reserved for those occasions when a quick and simple estimation is required, as in cases of accidents or when being used by untrained personnel. Wherever possible an automatic continuous recording apparatus should be used for CS_2 and also for H_2S estimation. In order to complete the results of air analyses, it would also be useful if portable air samplers could be worn by process workers during the whole shift in the areas where they are exposed to concentration of CS_2 ; one such model was demonstrated at the Symposium. When considering atmospheric contamination with CS_2 in viscose rayon factories, the added contamination by H_2S with respect to the hazard of intoxication by this substance must be considered.

(2) Basic research and the study of biological CS_2 -exposure tests must continue. The Symposium has heard how the iodine-azide test has been used in various countries and that it has given encouraging results when used in areas where the concentrations of CS_2 in the air exceeded approximately 60 gamma CS_2 /l. (20 ppm). The importance of recent biologic and clinical research was stressed. It was recommended to continue the investigation of metabolic disturbances caused by CS_2 , especially in connection with vitamin B_6 , of changes in catecholamines, the metabolism of lipids, and of the formation of organic metal complexes as reported at the Symposium.

(3) It would be desirable if most complete epidemiologic studies on the morbidity and mortality of workers exposed to toxic vapours in the viscose rayon industry for several years would be either continued or started.

(4) Although we do not have the final scientific proof of particular sensitivity of women towards CS_2 intoxication, the protection of women workers particularly from the aspect of fertility must be emphasized and the considerable toxicity of CS_2 considered. Therefore, a recommendation not to employ women in a work environment where the hazard of CS_2 intoxication is not negligible should be supported. This recommendation should apply also to all adolescents regardless of sex.

(5) It is recommended further that pre-employment and periodic examinations of workers who are or will be exposed to toxic substances in the viscose rayon industry be supplemented by neurologic and, if possible, also psychiatric examinations. Special attention should be paid to the cardiovascular system.

(6) The participants in the Symposium welcomed the establishment of working groups attached to the Subcommittee for Occupational Health in the Production of Artificial Fibres which would study, in international cooperation, special problems, mainly the question of maximum allowable concentrations, further development in biochemical research, the work of women, and other problems.

The high interest shown by experts in the toxicology of CS_2 was evident in the valuable reports and discussions at the first international symposium in Prague. This interest inspires the members of the Subcommittee to prepare and organize regular meetings, and especially, a second international symposium. During the preparation of the next international meeting the Subcommittee will study propositions and suggestions made at the Prague meeting."

According to Dr. Vigliani, the XVI International Congress on Occupational Health will be held in Tokyo from September 22-27, 1969.

INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

511 Tristate Air Pollution Monitoring System.

A tristate air pollution monitoring system to incorporate New Jersey, Pennsylvania and Delaware has been proposed by Pennsylvania Governor Raymond P. Shafer. The system would forecast weather inversions in the heavily industrialized Delaware Valley. Shafer proposed that an automatic air sampling station in Philadelphia would make an ideal nucleus for such an air pollution warning system, and that it could be tied in with a similar proposed station in Camden, New Jersey. "Such a network not only could have forecast the intensified air pollution episode which occurred throughout the valley last fall, but it could have led to preventive measures on the part of the industry and all other fuel users in alleviating its effect on residents of the entire area," Governor Shafer stated.

-- Air Eng. 9, 12 (April, 1967).

512 Air Pollution.

"It is imperative to remove from the air now all pollution within the range of feasibility," says Surgeon General William H. Stewart, "and we should push that word 'feasibility' just as far as we can push it in the direction of action." In testimony at a recent Senate hearing on air pollution control, Dr. Stewart pointed out that pollution control is aimed at producing an environment that is not only safe but conducive to good living. "Being healthy is not just being unsick. It implies, to me," he says, "the full and enthusiastic use by the individual of his powers of self-fulfillment."

-- Chem. Eng. News 45, 41 (April 24, 1967).

513 Air Pollution and Agriculture.

Last year air pollution caused agriculture an estimated \$500,000,000 in losses, and the problem is getting worse, according to a report in Agricultural Research, a Department of Agriculture publication. It is possible that farmers along the eastern seaboard may have to grow their crops indoors to protect them from serious air pollution damage. The report mentions: "Farmers no longer raise spinach in some areas of New Jersey because of pollution. Weather fleck, caused by the air pollution ozone, cuts yields and quality of shade-grown cigar wrapper tobacco in Connecticut, Massachusetts and Florida."

-- Air Eng. 9, 3 (May, 1967).

514 Anti-Pollution Foundation for Paint Industry.

A non-profit organization, Paint Industry Research Foundation Inc., has been formed in Los Angeles to provide research and other services to its members for anti-pollution control. Membership in the Foundation includes companies engaged in the process of applying paints, enamels, lacquers and the use of various chemicals; manufacturers who make, distribute and sell paints, etc.; and firms who manufacture base materials that are used by both paint manufacturers and processors such as solvents, chemicals and other materials.

-- Air Eng. 9, 18 (May, 1967).

515 Removing Sulfur Oxides and Fly Ash from Smoke.

A process of removing sulfur oxides and fly ash from power-plant smoke has been developed by Combustion Engineering. The process removes 98% of the sulfur dioxide, 100% of the sulfur trioxide, and 99% of the fly ash emitted by a power-plant stack, according to company president Arthur J. Santry, Jr. The process consists of air-injecting powdered dolomitic limestone into power-plant furnaces. Sulfur trioxide is removed by reaction with the calcined dolomite. Sulfur dioxide and fly ash are eliminated in a water scrubber. The company is continuing to test the process at a midwestern utility power plant, but will be ready to sell two units this year—one each for a coal-burning and an oil-burning power plant. The process could be adapted to any coal- or oil-fired plant and could operate at a reasonable cost, Mr. Santry says.

-- Chem. Eng. News 45, 63 (May 8, 1967).

516 Tracer Techniques to Study Sulfur Dioxide.

The feasibility of using isotope tracer techniques to study sulfur dioxide from smokestacks is under study by scientists at Brookhaven National Laboratory. They will tag emissions with stable isotopes—sulfur-32 and sulfur-34—to determine sources, quantities, and atmospheric distribution of sulfur dioxide. The ratio of these isotopes in samples collected around emission points will be determined with a mass spectrometer. Composition of the samples before and after tagging should provide the desired dispersion information. The study should be completed by midsummer.

-- Chem. Eng. News 45, 63 (May 8, 1967).

517 DDT Substitutes.

The U.S. Department of Agriculture (USDA) is conducting an intensive search for DDT substitutes to protect the nation's forests against insect pests, according to Secretary Orville L. Freeman. A 30-man research team of USDA Forest Service scientists is engaged in an evaluation project at the Pacific Southwest Forest Experiment Station in Berkeley, California, to find chemicals selective against individual species of forest insects. The new chemicals must break down into harmless components without contaminating the environment. Disclosure of the study comes on the heels of an announcement that the Forest Service has no alternative to using DDT in spraying 100,000 acres of privately owned timber in Maine to control budworms.

-- Chem. Eng. News 45, 45 (April 24, 1967).

518 Future Trends For Industrial Hygiene.

Several research areas are posing a challenge to industrial hygienists, according to William T. McCormick, President of the American Industrial Hygiene Association (AIHA). In a meeting of the Indiana Section of the AIHA, he pointed to the need for better sampling methods, improved instruments, and better analysis techniques. He also indicated that increased attention should be paid to mental health (psychiatric effects of injuries), weather changes (how they affect the individual), and underwater studies (how man can function in a hostile environment).

-- Safety Maint. 133, 4 (May, 1967).

519 New Occupational Health Committee.

The Manufacturing Chemists Association has established a committee to concern itself with toxicology, industrial hygiene, epidemiology, and medicine as applied to the chemical industry's inplant environment as well as the outplant environment and customer products. This broad view of environmental health—extending to the community and the safety of the product—will undoubtedly be seen more and more. The safety man or hygienist who does not become involved in community health and product safety will probably be the exception rather than the rule.

-- Natl. Safety News 95, 31 (May, 1967).

520 Lung Disorders Kill More Than Cars.

According to statistics from the Metropolitan Life Insurance Company, chronic respiratory diseases loom increasingly larger as a cause of death, now accounting for more than 83,000 deaths annually. (Traffic accidents claim some 52,000.) The over-all death rate from major respiratory diseases rose 12% between 1951 and 1965. Cancer of the lung and bronchus is the No. 1 killer. Although some authorities attribute these increases to better diagnosis, others see a direct relationship to increasing air pollution.

-- Natl. Safety News 95, 28 (May, 1967).

521 Accident Trends.

There are indications that the long-term declining trend in the work accident rate is leveling off. According to the National Safety Council, the 1966 death rate per 100,000 workers remained unchanged at 20. While deaths were up 3% and injuries nearly 5%, employment also rose more than 4%. Henry J. Hoeffler, assistant general manager of the Council, has blamed the tight labor market for the lowering of standards and the inexperience of workers which account for the higher accident rates. Occupational accidents killed 14,500 people last year and caused disabling injuries to 2,200,000 more. The Council estimates that these accidents cost the nation \$6.6 billion in lost wages, medical expenses, insurance overhead, interrupted production and other indirect costs. This was \$200 million more than in 1965.

-- Safety Maint. 133, 4 (May, 1967).

522 Advances in Welding.

Challenges of the space program have prompted advances in welding methods that can be used in many industries, two Westinghouse engineers report in a new National Aeronautics and Space Administration publication. The report by W.J. Reichenacker and J. Heuschkel covers developments in joining metals by mechanical fasteners, soldering, brazing, welding and plasma spray bonding. Special sections are included on joining the light metals of aluminum, titanium and beryllium, and the refractory metals of vanadium, columbium, tantalum and tungsten. Techniques for joining and sealing dissimilar metals and the use of iso-strength diagrams to insure maximum strength in connecting electronic components also are presented. The 140-page publication entitled "NASA Contributions to Metal Joining" has 29 tables, 54 figures, and 52 references to additional information. It was issued by the NASA office of Technology Utilization as part of a program to make the results of space research readily available to non-aerospace industry. The book is available as NASA SP-5064 for 60 cents from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

-- Am. Ind. Hyg. Assn. J. 28, 190 (March-April, 1967).

523 Hygienic Guide Series.

The following additional Hygienic Guide Series are now available: Acetylene (Ethine, Ethyne) and Oxygen Difluoride (Fluorine Monoxide). They are given in the March-April 1967 AIHA Journal pages 191-196 and can be obtained from the American Industrial Hygiene Association, 14125 Prevost, Detroit, Michigan 48227, at 50 cents each.

-- Am. Ind. Hyg. Assn. J. 28, 191-196 (March, April, 1967)

COMING EVENTS

- 524 July 3-7 Gordon Research Conference on Environmental Sciences, Crystal Mountain, Washington.
- July 5-7 Canadian Federation of Biological Societies, Montreal, Quebec.
- July 5-8 National Society of Professional Engineers, Hartford, Conn.
- July 9-13 American Veterinary Medical Association, Dallas, Texas.
- July 10-11 Missouri Conference on Trace Substances and Environmental Health, Columbia, Mo.
- July 10-14 American College of Angiology, Las Vegas, Nev.
- July 10-14 Nuclear & Space Radiation Effects Conference, IEEE, Columbus, Ohio.
- July 14-15 Rocky Mountain Cancer Conference, Denver, Colo.
- July 24-28 Engineering Foundation, Conference on Solid Waste Research and Development, Milwaukee, Wis.
- July 24-28 4th International Conference on Carbohydrate Chemistry, Kingston, Ont.
- July 24-29 ACS, Fluorine Chemistry Division, 4th International Symposium on Fluorine Chemistry, Estes Park, Colorado.
- July 31-Aug. 2 International Society for Human and Animal Mycology, New Orleans, La.

LEGAL DEVELOPMENTS

525 Control of Interstate Air Pollution.

Recommendations for control of interstate air pollution in the Kansas City, Kansas-Kansas City, Missouri metropolitan area issued on April 14 by Secretary of Health, Education and Welfare John W. Gardner to be effective that date were based on proposals made at an abatement conference held in Kansas City, Missouri, January 23 and 24 (See IHD, Abst. 108 p. 3, Feb. 1967.) The two-day conference was focused on the hazard to air traffic from reduced visibility due to air pollution at the Fairfax and Municipal airports. The principal recommendation calls for creation of a regional agency with legal authority to establish and enforce regulations for the prevention and control of air pollution problems in the area. Secretary Gardner recommended that the Federal Government be represented on the regional agency and have the same vote as each State delegation. He recommended that the State delegations include effective representation of local governments in the region. He also recommended that the abatement conference remain in continuing session, subject to the call of the Presiding Officer, until the proposed regional agency is established, staffed, and in operation. Presiding Officer of the Conference is S. Smith Griswold, Associate Director of the National Center for Air Pollution Control. Three other recommendations call for measures to

control air contamination from refuse disposal, salvage operations and industrial processes. These are: (1) Refuse disposal and salvage operations by burning, except in controlled multi-chambered incinerators, should be prohibited after August 1, 1967, within the survey area. This area is encompassed by a four-mile radius of the confluence of the Missouri and Kansas Rivers. Burning at the site of the Doecke Disposal Service in Kansas City, Kansas should be prohibited immediately. The same prohibition should apply to all other portions of the Kansas City Standard Metropolitan Statistical area no later than July 1, 1968. However, refuse disposal by individual households in sparsely populated areas is excepted from this prohibition. (2) Visible emissions from industrial processes in the survey area shall not exceed an emission equivalent in opacity to number one on the Ringelmann Smoke Chart. Twenty polluting companies are scheduled to meet this limitation. The companies must submit periodic progress reports to their respective State Air Pollution Control Agency and the Presiding Officer of the Conference until compliance is reported. (3) No new source may emit smoke in the metropolitan area in excess of number one on the Ringelmann Chart. John T. Middleton, Director of the Public Health Service's National Center for Air Pollution Control, has forwarded the Secretary's recommendations to Governor Robert Docking of Kansas, Governor Warren E. Hearns of Missouri and the heads of State and municipal agencies who participated in the abatement conference last January. As prescribed by the Clean Air Act, the Secretary must allow a period of at least six months for action to be taken on his recommendations. If adequate progress is not made, he may appoint a board of five or more persons to hold a public hearing following which he may forward the board's findings and recommendations to the States involved and to parties responsible for alleged sources of interstate air pollution. Then, if recommended abatement action is not taken within a period of at least six months, he may ask the Attorney General to initiate action in United States courts.

--mod. from USPHS Release, Apr. 14, 1967

BOOKS, PAMPHLETS AND NOTICES

- 526 Breathing Apparatus for the Fire Service. National Fire Protection Association. 60 Battery-march Street, Boston, Mass. 02110. 99 pp. (1967). AVAILABLE FROM: National Fire Protection Association. PRICE: \$2.50.

This publication, a practical text for fire fighters and fire department training officers, has recently been published by the National Fire Protection Association (NFPA). The soft-bound manual covers respiratory hazards which confront the fire service and gives thorough information on modern breathing apparatus designed to protect the individual fire fighter. There is detailed material on respiration in air and in smoke; measurement of hazardous atmospheres; purchase, testing and maintenance of breathing apparatus; training in handling of this equipment; and its actual use on the fire ground. Well-indexed and generously illustrated, the book includes photographs of latest models of breathing apparatus produced in the U.S. The text has been prepared by the NFPA Sectional Committee on Protective Equipment for Fire Fighters.

- 527 Schutzimpfungen (Vaccinations). H. Spiess, Editor. AVAILABLE FROM: Georg Thieme Verlag, Stuttgart, Germany. 2nd Edition. 379 pp. (1966). PRICE: D.M. 45.00

This is the second edition, the first edition having appeared nine years ago. In the preface of this edition the editor indicates that, in addition to a complete reworking of most chapters, the results of prophylactic vaccination against poliomyelitis in Germany and against measles have been included. The book provides the latest information on vaccination against bacterial and some viral diseases. Eleven scientists each a specialist in his field, have contributed their writings. Many of the chapters dealing with a specific disease or group of diseases, present a short historical review of the disease, the theoretic basis of the development of the specific immunity, the production of the vaccine, the demonstration of its safety, the indications and contraindications and complications of vaccination, and the statistics of the results of vaccination. Other chapters, dealing with mumps, hepatitis and respiratory diseases such as those caused by the adeno-, and rhino viruses, are understandingly shorter and less comprehensive. Every chapter concludes with a concise summary and a substantial list of references up to and including 1965. The book which is written in German is recommended for those who wish authoritative information of encyclopedic character on vaccines. --PG

- 528 The Handbook of Prescription Drugs. R. Burack, M.D. AVAILABLE FROM: Pantheon Books, Division of Random House, New York. 170 pp. (1967). PRICE: \$1.95.

Use of proprietary or brand names rather than official (i.e., generic or non-proprietary) names in writing 90% of today's drug prescriptions is damaging to both physicians and the public.

For physicians, it represents abandonment of physician leadership and control of therapeutic practice. For the public, it means spending far more for prescription drugs than would be the case if generic descriptions were routinely used in drug prescriptions. To rectify these conditions, the author—Clinical Associate in Medicine and Affiliate in Pharmacology at Harvard Medical School—lists the generic names, sources and wholesale prices of a series of drugs which suffice for treating 90% or more of adult patients who are prescribed for by general practitioners or internists in the United States and who are not sick enough to be hospitalized. Counterpart brand names are also given and the list is organized into 18 categories of therapeutic usage. The 1966 prices shown for these drugs support the author's statement that "brand name" equals "higher price". The argument that higher prices for proprietary drugs is justified by the need for research is discounted by the author on several grounds, including the fact that new drugs, developed mostly by large drug manufacturers, are patentable for 17 years. To the question "Are brand-name products superior?" the author maintains that there is no good reason to believe that brand-name drugs are necessarily more reliable than generics. In support of this statement he lists drug recalls and other remedial actions taken under the Food, Drug and Cosmetics Act for the first half of 1965. This shows that "nearly half of the recalls involved products of the largest and best-known corporations". By the nature of its case and by making prices of prescription drugs available to physicians and the public generally, this book is likely to draw heavy opposition from many who make and dispense brand-name prescription drugs. On the other hand, there are certain to be many who will agree with the writer of the book's preface that its information is of "potential use to all interested in seeing an end to unbridled escalation in the expense of medical care".

-- Harry B. Burr, Westinghouse Electric Corp.

Editor's Note: When Dr. Burack's book was first brought to our attention on May 19, it was thought that it might be of timely interest to Digest readers. Mr. Burr was invited to submit the above review. That there is a high degree of general interest in the subject of controlling costs of medical treatment is further shown by the TV appearance of Dr. Burack on the "Today" Show on May 29. His book is also mentioned in the May 26 issue "Medicine" Section of TIME Magazine, in which it is stated that generic equivalency, chemically, may not provide matching effectiveness therapeutically. In this regard, the Department of Defense (according to the article in TIME) is said to be setting standards requiring low-bid manufacturers to prove that, for 28 key drugs, their products' chemical equivalence is matched by equal medical efficacy.

-- RTPdeT

- 529 Inhaled Particles and Vapours II. Proceedings of an International Symposium Organized by the British Occupational Hygiene Society, Cambridge, 28 September-1 October 1965. Edited by C.N. Davies. AVAILABLE FROM: Symposium Publications Division, Pergamon Press Inc., 44-01 21st Street, Long Island City, New York 11101. 605 pp. PRICE: \$15.00.

In 1960 the first International Symposium on inhaled particles and vapours was held at Oxford, and the Proceedings were subsequently published as Inhaled Particles and Vapours I. Volume II presents the Proceedings of a second symposium, held at Cambridge and attended by some 300 persons. The period since the first is comparatively short so far as scientific development is concerned. In consequence the progress recorded derives closely from the activities originally covered, and the first volume can therefore be referred to with benefit in conjunction with the second one. In addition, a valuable fund of information is contained in the pages of Inhaled Particles and Vapours II and the important, varied and interesting nature of the forty-eight papers presented can be appreciated from study of their title: Lung anatomy and physiology; changes in the lung airways due to dust; the specific action of silica upon the lung; effects of miscellaneous dusts; lung clearance in animals; dust deposition and clearance in the human lungs; dust content of human lungs; the relationship of dust content to lung disease; airborne dust and sampling. Interesting experimental techniques which are applied include the following: The measurement of air velocity and the flow of mucus in the human nose; the quick-freeze method of fixing animal lung tissue so that changes in the size of airways can be noted; the measurement of histamine in lung tissue; quantitative recording of collagen formation; demonstration of the cytotoxicity of silica; the isolation of lung macrophages. Recent conclusions about the action of polyvinylpyridine-N-oxide in inhibiting silicosis are explained and the stimulation of macrophage production by silica is studied. New ideas on estimating radiation hazards due to inhaled radioactive dusts are worked out. The latest work on dust deposition in the human lungs is reported. This volume will provide up-to-date information about the breathing of foreign substances to a wide range of readers including industrial hygienists, pathologists and lung physiologists. It will be essential reading for research workers, students and university staff in the fields of atmospheric pollution, lung cancer, cross infection, pneumoconioses and fungal infections, while practitioners who deal with agricultural, veterinary and other occupational diseases will find it invaluable.

-- Modified from flyleaf.

Editor's Note: Three of the papers reported on work performed or contributed to by Dr. Paul Gross, Director of the Foundation's Research Laboratory. One of these (Alveolar Clearance: Its Relation to Lesions of the Respiratory Bronchiole) was the basis for the 1967 Meritorious Authorship Award to Dr. Gross. This award is given to the author of the most outstanding paper in the field of Occupational Health during the preceding year by the Industrial Medical Association. (See Editorial, Industrial Hygiene Digest 31:4 page i, April 1967.) -- RTPdeT.

INDUSTRIAL MEDICAL PRACTICE

- 530 Industrial Medicine—An Art or a Science? T.S. Scott.
Brit. J. Ind. Med. 24, 85-92 (April, 1967).

Until the First World War the practice of industrial medicine was based largely on the judgments made from the clinical examination of workers and observation of what went on in the factory. There were few scientific methods such as used today to assess risks and evaluate preventive measures. How successful were the early practitioners of industrial medicine in combating occupational disease and in promoting the health of work people? Despite their limited facilities they had many signal successes, some of which were achieved in the face of opposition or indifference. The tools they had were observation, clinical medicine, and judgment, helped sometimes by inspiration and maybe sometimes by guess work. The early successes were achieved at the stage of development of industrial medicine when the diagnosis of industrial disease was made by clinical observation alone without the aid of the sophisticated scientific tools used today. The author discusses the following: The Physical Environment, Occupational Hygiene Services, The Psychological Environment, Dangerous Chemicals, Benzene, Isocyanates, Byssinosis, Farmer's Lung, Electronics, Electric Shock, Noise-Induced Hearing Loss, and Human Values.

- 531 The Occupational Hygiene Survey: Principles, Practice, Significance. M.M. Luckens.
Am. Ind. Hyg. Assn. J. 28, 179-183 (March-April, 1967).

The occupational hygiene survey is a technic for the evaluation of the working environment and its effects on the health of the workers. The three basic components of the vocational complex are basic environment, machine-process requirements and biologic factors. The many facets of the survey and evaluation of the interrelations and effects of these components are discussed in detail.

-- Author's abstr.

- 532 Physical and Mental Disabilities of 1,190 Ordinary Motorists. W.D. Rees.
Brit. Med. J. 1, 593-596 (March 11, 1967).

Known illnesses of 1,190 rural drivers, determined from patient records, were studied. A total of 9.2% (109) of the drivers were assessed as unsuitable to drive a public service vehicle. The study revealed that 6.5% (77) had physical illnesses, and that 2.7% (32) had mental illnesses; 7.4% (69) of the male drivers and 3.0% (8) of the female drivers had significant physical illnesses; 2.2% (20) of the male drivers and 4.6% (12) of the female drivers had mental illnesses. Most of the drivers with physical illnesses were over the age of 50, with the largest single group in the fifth decade. Most of the drivers with mental illnesses were below the age of 50, with the largest single group in the third decade. Epileptics were found to drive in the proportion expected in those who do not suffer from that illness. Some severely disabled people renew their licenses although they no longer drive.

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

- 533 The Business Executive, His Nervous Tensions, and His Periodic Health Examination.
G.A. Copping. J. Occ. Med. 9, 59-63 (Feb. 1967).

The well-performed periodic examination of business and industrial executives can be expected to uncover important and often remediable physical defects in a sufficient number to justify its use. There is, as well, a large benefit in the discovery of important anxiety and depressive states. The diagnosis and management of such emotional and nervous disturbances call for an awareness of the problem they constitute, and demand the acumen and skill of a well-trained, experienced, and interested physician. Three references are given.

-- Author's summary

- 534 Identification of Problem Drinking Among Drunken Drivers. J.A. Waller.
J. Am. Med. Assn. 200, 114-120 (April 10, 1967).

Information about previous contact with community agencies, particularly contact involving drinking problems, was compared for 150 drunken drivers, 33 accident-involved drivers who had been drinking but were not arrested, 117 sober drivers involved in accidents, 131 drivers with moving violations, 19 drivers with citations plus arrest warrants, and 150 incident-free drivers. Screening criteria for problem drinkers were two or more previous arrests involving drinking or identification by a community agency as a problem drinker. These criteria were met by the following: drunken drivers, 63%; drivers with an accident after drinking, 50%; drivers with warrants, 30%; nondrinking drivers with an accident 14%; persons with driving violations, 8%; and drivers with no incidents, 3%. High correlation was found between two or more arrests involving drinking and an impression of problem drinking. Eighty-seven per cent of the drunken drivers were known to community agencies, most with multiple contacts starting before age 30. There are 9 references.

-- Author's abst.

- 535 Primary Myocardial Disease and Alcoholism. J.R. Tobin, Jr., et al.
Circulation 35, 754-764 (April, 1967).

The course of primary myocardial disease (PMD) was observed in 39 alcoholics. After initial examination three years or more before this report, the severity of each patient's illness was classified as stage I, II, or III. Stage I patients had minimal symptoms and normal-sized hearts. Stage II patients had evidence of concentric left ventricular hypertrophy and clinical manifestations like those of hypertensive heart disease. Stage III patients had left, and frequently right, ventricular hypertrophy and dilatation associated with persistent congestive heart failure and clinical manifestations typical of patients with PMD. Only the duration of congestive heart failure differed significantly between stages II and III. Eight patients had exploratory mediastinotomy and myocardial biopsy. Gross and microscopic findings supported the diagnosis of PMD and the classification of severity and revealed diffuse interstitial fibrosis. The studies emphasize alcoholism's importance in the genesis of this form of PMD. Correlations were positive between abstinence from alcohol and waning of clinical severity, and between persistent drinking and waxing of clinical severity.

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

- 536 Ergonomics: The State of the Art. E.R. Tichauer.
Am. Ind. Hyg. Assn. J. 28, 105-116 (March-April, 1967).

The development of ergonomics is traced from its early origins in munitions manufacture during World War I until today, when applied anatomy and physiology have taken their place alongside the behavioral sciences in equipment design, in work-place layout, and in the development of manufacturing processes. The modern concepts of ergonomics, considering the man-equipment and man-environment interfaces as loci of physical stress transmittal, are discussed. Some problems of specialized working populations such as women and cardiac rehabilitees are mentioned. The minimization and prevention of work stress, through the application of ergonomics in industry, falls within the proper province of industrial hygiene, the discipline devoted by definition to the study and control of work-place-induced strain on man. There are 35 references.

-- Author's abst.

- 537 Pulmonary Hypersensitivity to the Grain Weevil. J.A. Lunn and D.T.D. Hughes.
Brit. J. Ind. Med. 24, 158-161 (April, 1967).

A case of inhalant allergy to the grain weevil is described. Provocation inhalations of the weevil protein produced immediate responses shown by falls of as much as 25% in the forced expiratory volume in one second ($FEV_{1.0}$). These changes were reversed by a bronchodilator. Arthus-type reactions also occurred approximately three hours after the inhalation of protein. In these the transfer factor was reduced by 25% and was not affected by a bronchodilator. Antihistamines were found to inhibit the immediate response but to have no effect on the Arthus reaction. Coincident with the fall in transfer factor there were rises in the temperature and pulse rate. An Arthus-type as well as an immediate skin response was demonstrated. Precipitating antibodies were detected in the serum. The similarity of these reactions to those seen in farmer's lung and to avian protein is discussed, together with the possibility of the wider implications of sensitivity to the grain weevil.

-- Authors' abst.

- 538 Relation of Body Weight to Development of Coronary Heart Disease:—The Framingham Study. W.B. Kannel, et al. *Circulation* 35, 734-744 (April, 1967).

Weight change, serum cholesterol, and blood pressure in relation to risk of developing coronary heart disease (CHD) were explored over 12 years in 5,127 men and women in Framingham, Mass. Risk of angina pectoris and sudden death was proportional to the degree of overweight. Adiposity, however, proved unrelated to the rate of development of myocardial infarction. The contribution of obesity to risk of angina and sudden death was independent of blood pressure and cholesterol level subjects predisposed to coronary disease by hypertension and elevated cholesterol had a pronounced risk if also obese. In women, obesity appeared to play a negligible role unless accompanied by hypertension. Obesity imposes an increased workload on the heart.

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

- 539 Leukemia Mortality: Downturn Rates in the United States. J.F. Fraumeni, Jr., and R.W. Miller. *Science* 155, 1126-1128 (March 3, 1967).

The first observed decline in leukemia mortality rates for the United States white population between the ages of 1 and 74 occurred recently. Data relating to the U.S. leukemia mortality rates for 1921 to 1965 were studied as well as statistics for England and Wales for the period 1921 to 1964. The largest reduction in rates among U.S. whites, and the only decline in rates for England and Wales, occurred in children under five years of age. Included in possible factors responsible for the decline is diminished exposures to medical x-rays following release in the U.S. and Great Britain in 1956 of widely publicized reports on the biologic effects of ionizing radiation.

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

- 540 Mule Spinners' Cancer and the Wool Industry. W.R. Lee and Joan K. McCann. *Brit. J. Ind. Med.* 24, 148-151 (April, 1967).

Although mule spinning has been used in the cotton and wool industries for about two centuries, the earliest recorded cases of mule spinners' cancer were not reported until the end of the nineteenth century. From then on the number of cases rapidly increased. Evidence accumulated which strongly suggested that the mineral oil used to lubricate the mule spindles was the cause. It is remarkable that mule spinners' cancer was almost entirely confined to the cotton industry, and the wool industry has escaped with very few cases. This difference has never been satisfactorily explained. Various possibilities related to the personnel, the plant, and the process are examined in this paper.

-- Authors' abst.

- 541 Tar and Nicotine Retrieval From 56 Brands of Cigarettes. G.E. Moore, et al. *Cancer* 20, 323-332 (March, 1967).

Tar and nicotine yields of 56 brands of cigarettes were determined. Tar yields ranged from a low of about 8 mg. to as high as 43 mg. per cigarette. Nicotine yields, which closely correlate with tar yields in most cases, ranged from about 0.3 to 2.6 mg. per cigarette. There were substantial differences among cigarettes of the same general type. Among cigarettes without filters, tar yield depends chiefly on the length of the cigarette. Filter cigarettes show the greatest variability in tar yield, ranging from 8 to 42 mg. per cigarette. Among cigarettes with filters tar yield depends on the length of the cigarette and the weight of the filter—longer cigarettes and light-weight filters being associated with higher tar yields. It seems clear that manufacturers are able to produce cigarettes with almost any yield of tar and nicotine from very low to very high. This potentiality is important in the control of diseases caused by cigarette smoking.

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

- 542 Populations of Nonrespiratory Bronchioles in Pulmonary Emphysema. A.E. Anderson, Jr., and A.G. Foraker. *Arch. Pathol.* 83, 286-292 (March, 1967).

A controlled analysis of populations on nonrespiratory bronchioles showed these structures to be generally decreased in pulmonary emphysema in persons less than 70 years old. This was thought to provide a source of some of the airway obstruction occurring in that disease. There were exceptions to the general trend, especially in those 70 and over, however, that led to the conclusion that diminution in the number of nonrespiratory bronchioles was of secondary importance and not a critical factor in air flow obstruction. The potential fates of nonrespiratory bronchioles that did disappear as recognizable structures are discussed. There are 15 references.

-- Authors' abst.

SKIN DISEASES AND BURNS

- 543 Skin Reaction From Gold Jewelry Contaminated With Radon Deposit. N. Simon and J. Harley. J. Am. Med. Assn. 200, 254-255 (April 17, 1967).

When unexplained skin reaction results from contact with gold jewelry, radiation reaction should be suspected, and the gold should be tested for radioactivity. Gold to be processed for jewelry and dental use should be monitored for radiation contamination with gold seeds of decayed radon. -- Authors' conclusion

- 544 Development of Allergic Nickel Dermatitis From Earrings. L. E. Gaul. J. Am. Med. Assn. 200, 176-178 (April 10, 1967).

Wearing earrings is the latest vogue among adolescent girls. The most fashionable earrings require the ear lobes to be pierced. A physician may do this, a friend, or a relative; it is possible to buy an instrument to do it yourself; and there is even a gadget available that will pierce the ears while sleeping. It is a common practice to insert the jewelry device at once so that the channel stays open. During the fall of 1966, and in a period of one month, five girls were seen with itchy, inflamed, and indurated ear lobes. Brief reports of the cases are presented. The author concludes that ear lobes should be pierced by approved techniques. Channel patency should be maintained with gold or silver wires of known composition, or black silk thread. Earrings should not be worn until the channels are completely epithelized. The person piercing the ear should follow through with his subjects and direct them to a source of earrings which are known to be nonirritating and nonsensitizing. Four references are given.

- 545 A Prognostic Study of Occupational Dermatitis Cases in a Chemical Works. K. S. Williamson. Brit. J. Ind. Med. 24, 103-113 (April, 1967).

An examination has been made of the medical records of a group of white-skinned men, new starters in a works manufacturing dyestuffs and related chemicals. One thousand, four hundred and fifty-two such men started employment in the works in the five years 1955-59; 745 were employed as chemical process workers, 266 as chemical plant maintenance engineering workers, 335 as non-plant engineering workers, and 106 in various miscellaneous jobs. The process and plant engineering workers have considerable contact with chemicals; the non-plant engineering and miscellaneous workers have little or no chemical contact. There were no differences in age at the time of the first attack of occupational dermatitis between those who developed a recurrence and those who did not. In 17 men the first attack of occupational dermatitis was due to hypochlorite and of these three had one or more recurrences. Thirty-six of the 98 men whose first attack was due to other primary irritants had a recurrence, and six of the 15 men whose first attack was due to sensitizers had a recurrence. A permanent change of work was necessary in 16 cases; all these men were found jobs within the works and none was obliged to accept work at a lower rate of pay. Four men are known to have left because of occupational dermatitis. -- Cond. from author's abst.

- 546 Ayan Dermatitis. J. W. W. Morgan and J. Thomson. Brit. J. Ind. Med. 24, 156-158 (April, 1967).

Dermatitis due to ayan wood (*Distemonanthus benthamianus*) is described. The main clinical features appear to be an initial slight itch followed later by intense erythema and pruritus often precipitated by washing. Previous work on the extractives of the wood have suggested that there may be two varieties of ayan, one rich in oxyayanin-B and the other rich in distemonanthin. Two other flavonoids, oxyayanin-A and ayanin, were found in both varieties. Patch tests were carried out using the various extractives and the whole wood, and the results suggest that only oxyayanin-A and oxyayanin-B contribute to the sensitizing action. One type of ayan wood contains a preponderance of oxyayanin-B and the other preponderance of distemonanthin; there is no quick method of distinguishing between the two, but it is the former which seems more liable to sensitize. -- Authors' abst.

- 547 Insect-Sting Allergy. D. D. Houser and I. Caplin. Am. J. Diseases Children 113, 498-503 (April, 1967).

Allergic reactions to those afflicted with Hymenoptera sensitivity can be typed either immediate or delayed. The immediate reactions can vary in severity, ranging from mild, local urticaria

to severe systemic reactions, peripheral vascular collapse, and death. Delayed reactions such as a serum sickness-like reaction are also seen. Skin testing acts as a guide for starting dosage in hyposensitization. There are some patients who are sensitive to insect stings but have negative reactions to skin testing. The decision as to whether a patient should be treated with hyposensitization is based entirely upon clinical judgment. Because of cross sensitivities between the various insects, a mixture of bee, wasp, yellow jacket, and hornet allergens are used for treatment. Treatment resolves itself into avoidance, hyposensitization, and symptomatic care. Avoidance is discussed in detail. Hyposensitization is carried out in a manner similar to the treatment of the pollen-sensitive patient. An arbitrary top dose of 5,000 PNU/cc, is usually strived for in those who can tolerate this high dose. In light of present understanding, treatment must be continued indefinitely. Treatment of the sting is discussed in detail; epinephrine is the drug of choice for treating immediate reactions, and must be administered as soon as possible.

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

- 548 Metabolic Effects of 0.5% Silver Nitrate in Treatment of Major Burns in Children.
C.C. Bondoc, et al. *J. Pediat. Surg.* 2, 22-28 (Feb. 1967).

Silver nitrate therapy has altered several aspects of the care of the burned child, but problems in electrolyte metabolism were encountered. Rapid loss of body electrolytes, especially of Na, occurs through the effect of the hypotonic AgNO_3 solution on the wound. The daily loss of Na and Cl in an extensively burned child is large enough to dangerously lower serum Na levels within 24 hours if adequate replacement is not given. Metabolic balance studies have shown that the level of Na needed to lower adequately the obligatory Na losses in the wound and provide for normal Na metabolism is 350 mEq Na/sq.m. burn surface/day. This figure must be taken as a first approximation and tailored to fit each individual patient's needs. These studies indicate further that the care of the burned child treated with AgNO_3 can be simplified by using the level of urinary excretion of Na as a guide to the efficiency of Na replacement.

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

CHEMICAL HAZARDS

- 549 Premalignant Cells in Tumorigenesis Induced by Plastic Film. K.G. Brand, L.C. Buoan, and I. Brand. *Nature* 213, 810 (Feb. 25, 1967).

Inbred mice at the age of 1.5 to 2 months received subcutaneous inserts in both flanks of double vinyl chloride acetate coverslips. A control group was left to itself. Tumors developed in 65% of the male animals 9 to 12 months after operation, and in almost all the female animals after 7 to 12 months. In the experimental group, inserts and tissue capsules were cut in thirds after intervals of 2 weeks to 12 months. One portion was left in the original animal. A second portion was used for histological, karyological and cultural examinations. The plastic and capsule pieces of the third portion were carefully separated and then individually transplanted into CBA-H recipient mice. No tumors developed in the original and the recipient animals when transplantation was carried out during the first five months after initial insertion of the plastic films. It is concluded that during this period premalignant cells either had not yet emerged or were unable to mature further outside the original film/capsule condition. Tumors developed at the expected rate in the original and also in the recipient animals when the transplantation was carried out six or more months after the initial insertion of the plastic films.

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

- 550 Selenium and its Compounds. Anon.
Natl. Safety News 93, 42-45 (May, 1966).

Selenium compounds are potent skin and mucous membrane irritants producing dermatitis varying from erythema to burns with vesiculation. These compounds may produce nose, throat, and eye irritation. Excessive exposure leading to systemic poisoning may occur when selenium compounds are processed in powder form as in mixing, blending, milling, or other activities where dust may be inhaled. Tentative threshold limits for several selenium compounds are given. A program of air sampling to ascertain that concentrations of selenium compounds do not exceed threshold limits should be carried out in cases where workers are exposed to dust, vapor, gas or fumes of selenium compounds. There are 10 references.

-- APCA Absts.

- 551 Metals in Pathology, I. In Vascular Disease. S.A. Gunn, Thelma C. Gould, and W.A.D. Anderson. *Bull. Pathol.* 8, 42-43 (Feb. 1967).

It has been said that one is as old as one's endothelium—and experimental evidence suggests that vascular integrity may be influenced by certain metals, among them cadmium, zinc and selenium. Selenium has attracted much attention not only as a potent injurious agent responsible for world-wide economic losses in livestock disease when ingested in excess, but conversely as a possible dietary essential as well. At a recent symposium it was emphasized that distinct vascular manifestations attend the pathological changes described for selenosis; whereas, as a possible nutrient, trace amounts of selenium are effective in the prevention of myopathies of skeletal and cardiac muscle in livestock. It has been suggested that selenium deficiency in human beings may be as important a factor in some disease syndromes as in animals. In the laboratory a variety of syndromes of dietary deficiency produced in many species of animals can be blocked by administration of trace amounts of selenium. The primary cause of one such disorder, exudative diathesis in chicks, is strongly suspected to be capillary impairment. But perhaps the closest association of metals with vascular disease is that cadmium itself has recently become prominently suspect in hypertensive disorders. Small doses of cadmium fed to rats for their lifetimes cause hypertension, changes in renal vasculature, and increased mortality at kidney concentrations less than those of American adults. The kidneys of most human beings who have died from hypertensive complications have shown increased concentrations of cadmium or increased ratios of cadmium to zinc, compared to those of subjects who have died of a variety of other major diseases. Additional substantiation has recently been provided by a statistical study correlating human deaths from cardiovascular disease with cadmium levels in the air.

- 552 Distribution of Arsenic in Nonexposed Persons (Hair, Liver, and Urine). G.W. Boylen, Jr., and Harriet L. Hardy. *Am. Ind. Hyg. Assn. J.* 28, 148-150 (March-April, 1967).

Analysis of "normal" hair showed an average of 0.3 microgram of arsenic per gram, and analysis of "normal" liver showed an average arsenic content of 0.35 microgram per gram on an air-dried basis. The commercially available alcoholic beverages tested did not contain an appreciable amount of arsenic. An increased body level of arsenic in persons with cirrhosis of the liver who were alcoholics, compared with other persons, could not be shown. There are 11 references.

-- Authors' abstr.

- 553 Beryllium. C.J. Leadbeater. *J. Roy. Aeron. Soc.* 70, 781-787 (Aug., 1966).

Persons involved in handling certain forms of beryllium are liable to respiratory illness and specific skin reactions. The serious symptoms of berylliosis, the respiratory disease, result from the inhalation of beryllium compounds such as fluoride or sulfate. Inhalation of finely dispersed beryllium oxide also gives rise to the disease. The mild form of reaction to beryllium occurring in sensitive individuals, is a contact dermatitis caused by handling beryllium and its compounds. The resultant rash disappears when contact with the beryllium compound ceases. The presence of fine beryllium dust with its associated oxide, or independent oxide particles, must not be tolerated and basic precautions are essential for the maintenance of health and safety. The statutory maximum atmospheric concentration is 2 micrograms/cu. m. averaged over an 8-hour day and 25 micrograms/cu. m. as the maximum concentration which may not be exceeded even for a short time. Strict controls apply also to stack effluents and wastes. Experience in several establishments on this problem has proved that good housekeeping by the confinement of dust by means of effective ventilation systems, collection of dusts, scrupulous cleanliness by personnel and equipment can remove the health risk in beryllium technology. This report stresses the mechanical properties and metallurgical processing of beryllium.

-- APCA Abstrs.

- 554 Saturnine Gout. G.E. Ehrlich and J. Chokatos. *Arch. Internal Med.* 118, 572-574 (Dec. 1966).

A middle-aged man simultaneously had lead toxicity and gout. The coincidental occurrences, as suggested in the medical literature of the past, may imply a causal relationship. Chelation was able to remove the lead stored in the body, but uricosuric therapy was ultimately required to maintain lowered serum urate levels.

-- Author's summary

Editor's Note: Drs. Ehrich and Chokatos have presented this case to stimulate further discussion of "saturnine gout". The diagnosis of the case presented as lead poisoning is not well documented as such—the blood lead level is expressed incorrectly as "serum" lead but interpreted as whole blood lead (about 95% of the lead is associated with the erythrocytes). Even so, the level is below 0.08 which represents the lowest level at which clinical lead intoxication may be expected, based on the extensive experience and researches of Kehoe and many others. The response of blood lead level to chelation is not of itself diagnostic, nor is the urinary concentration. Both could occur in the absence of disease. The urinary coproporphyrin changes are not diagnostic and are difficult to interpret in the context presented. Digest readers interested in diagnostic criteria for lead intoxication and the effects of chelates are referred to the following references: (1) Robert A. Kehoe, M.D. in Patty Industrial Hygiene and Toxicology, Volume II, Second Revised Edition (edited by D.D. Irish and D.W. Fasset, 1547 pp., John Wiley & Sons, Inc., 605 Third Avenue, New York, N. Y., 1963); (2) L.H. Miller, M.D., "Chelation EDTA Therapy in Persons with Excessive Lead Absorption From Industrial Exposure," Ind. Med. & Surg., 28, 144-147 (Mar. 1959).

M. P. Westerman, M.D. and W. M. Jensen, M.D. ("Concentration of Lead in Bone in Plumbism," New Engl. J. Med. 273, 1246-1250, Dec. 2, 1965), have studied the supposed exacerbation of lead intoxication in the presence of chronic disease. They failed to find supportive evidence for this hypothesis, which was widely accepted as factual without question by many clinicians a decade or more ago, and which still influences clinical thinking today, as evidenced in this paper. Equally dubious, on any evidential basis, old or new, is the triggering of an attack of gout by the absorption of unusual quantities of lead. While this patient cannot be said to have been suffering from lead poisoning there is no satisfactory reason for supposing that lead intoxication and gout may not occur coincidentally in the same person. --RTPdeT

- 555 Lead in Hair of Children with Chronic Lead Poisoning. L. Kopito, R.K. Byers, and H. Shwachman. New Engl. J. Med. 276, 949-953 (April 27, 1967).

The present study explores the quantitative analysis of lead in hair as an aid in the diagnosis of chronic, mild or subacute lead poisoning in children. Hair, one of the lesser known sites for lead accumulation, concentrates more lead per unit weight than any other tissue or body fluid, including bone, blood and urine. In healthy persons the concentration of lead in scalp hair may be from two to five times greater than in bone, about ten to fifty times higher than in blood, and from a hundred to five hundred times greater than that excreted in urine. Hair presents an advantage from the point of view of case finding since it is easily obtained, stored and analyzed. This constantly growing tissue preserves a record of lead exposure that can be studied by analyses of serial sections of hair beginning at the scalp. The authors have applied these notions to a group of 17 patients recently hospitalized with lead poisoning. A procedure for the analysis of lead in hair is described. The results, based on differences in the lead levels of adjacent hair segments or considerably elevated concentrations, or both, provide an additional means for confirming the diagnosis of chronic plumbism in children. Good correlation is observed with the major clinical and laboratory findings. This method is most useful when used in conjunction with the radiographic observations and other laboratory data, particularly when these are equivocal and of nondiagnostic quality. Because hair is readily available and easy to obtain, this measurement may provide a simple means for screening children exposed to possible lead intoxication. The procedure described is not suitable for establishing the diagnosis of acute lead intoxication. There are 14 references.

- 556 Environmental and Clinical Control of Lead Exposure in a Non-Ferrous Foundry. B.A. Berg and C. Zenz. Am. Ind. Hyg. Assn. J. 28, 175-178 (March-April, 1967).

In a non-ferrous foundry employing 75 workers, monitoring of the lead concentrations in the workroom atmosphere and in the urine of workers began in 1943. A rise in concentrations was noted over the years and found to be due to increased lead in the alloys and to development of some poor work habits. Installation of modern exhaust ventilation and a clinical surveillance program have prevented any cases of clinical lead poisoning. The urinary coproporphyrin screening technique has proven to be valuable in this program. Three references are given. -- Authors' abst.

- 557 Lead Poisoning in Childhood. Epidemiology, Manifestations, and Prevention. H. Jacobziner. Clin. Pediat. 5, 277-286 (May, 1966).

The epidemiology of lead poisoning in New York City is reviewed. Most cases seem to occur as a result of ingestion of old lead-containing paint in sub-standard housing, particularly in children under 7 with a history of pica. Death occurs in 15-20% of survivors. The most useful diagnostic indication is lead concentration of 0.06 mg./ml. whole blood. Although ingestion of lead paint is the most frequent source of poisoning, inhalation of lead also occurs. The increased incidence of lead encephalopathy in the summer time is tentatively ascribed to increased absorption through the mediation of ultraviolet radiation. The program of the New York City Department of Health in isolating, treating, and preventing lead poisoning is described.

-- APCA Absts.

- 558 The Biochemistry of Lead. Review of the Body Distribution and Methods of Lead Determination. E. Berman. Clin. Pediat. 5, 287-291 (May, 1966).

Routes of lead absorption, tissue distribution, blood lead levels, and methods of lead analysis are discussed. Although lead is ingested orally in most cases of childhood lead poisoning inhalation of lead is the route of absorption in most industrial and a few children's poisonings. Absorption from the respiratory tract is more rapid and complete than from the gastro-intestinal tract. Lead passes from early concentrations in liver and kidney to deposition in the bone. Blood lead levels are of diagnostic value only in acute cases, since the blood is rapidly cleared of lead; urine levels should also be determined. The author used atomic absorption spectrometry in the detection of lead in blood and urine samples; the method required only 1 1/2 hours, and could detect less than 0.2 ppm. in an aqueous solution. Analyses made during BAL-versenate therapy showed an increase in lead excretion, then a gradual decrease as the bound lead was excreted.

-- APCA Absts.

- 559 Lead Poisoning in Childhood. Signs, Symptoms, Current Therapy, Clinical Expressions. J. Greengard. Clin. Pediat. 5, 269-276 (May, 1966).

This paper is a review specifically of 182 cases of lead encephalopathy treated at Chicago's Cook County Hospital; it also includes a general discussion based on 25 references of various phases of the problem of lead poisoning. Etiology (usually from ingested plaster and paint in slum housing), diagnosis, treatment, and complications are reviewed. Emphasis is placed on treatment of the more severe cases which result in lead encephalopathy. Prevention by removal of lead sources was considered as obviously the best treatment, but difficult to put in practice because of the slum housing areas prevalent in the urban neighborhood.

-- APCA Absts.

- 560 Neurologic Sequelae of Plumbism in Children. M.A. Perlstein and R. Attala. Clin. Pediat. 5, 292-298 (May, 1966).

Cases of lead poisoning in 425 children are reviewed, with emphasis placed on permanent nerve damage. Although most cases resulted from ingestion of old painted plaster, the burning of battery casings was responsible for poisoning by inhalation in 17 cases. In 61% of the cases, recovery was complete. The main sequelae were mental retardation (occurring in 22% of the total series), recurrent seizures (20%), cerebral palsy (2%), and optic atrophy (1%). The most severe cases; those with enccephalopathic onset of symptoms, were also those in which sequelae were most frequent. In the largest group of patients, presenting with gastro-intestinal symptoms, sequelae were relatively infrequent. Three case histories are given in detail.

-- APCA Absts.

- 561 Inhibition of Intercellular Matrix Synthesis During Ingestion of Inorganic Lead. G.M. Hass, W. Landerholm, and Anne Hemmens. Am. J. Pathol. 50, 815-848 (May, 1967).

Hypervitaminosis D was produced in rabbits on a normal diet. In the first few weeks, resorption of bone with deposition of calcium in many extraosseous locations, such as the media of certain arterial systems, was conspicuous. In the succeeding weeks, despite continued administration of Vitamin D, resorption of abnormal calcified extraosseous tissues became prominent and large amounts of a newly formed basophilic intercellular matrix appeared in bone. This appearance coincided with the deposition of a collagenous intercellular matrix in the thickening intima of many arteries with calcified medial structure. The basophilic matrix in bone increased in quantity until it practically obliterated the marrow spaces. It promptly acquired

calcium and was gradually converted into an eosinophilic osteoid matrix and thence into mature bone with extremely dense osteosclerosis as the final result. In arteries, especially in the iliac and femoral arteries, the thickening of the intima, due principally to new formation of collagen, kept pace with calcification of the subjacent media so that by the time the media was fully calcified, the thickness of the intima approached or exceeded the thickness of the media. If the hypervitaminosis D regimen was instituted in rabbits ingesting lead subacetate (with or without linseed oil containing the usual lead drier), the customary early tissue changes characteristic of hypervitaminosis D occurred. Later on, however, the Vitamin D-induced production of intercellular matrices in arterial intima and in bone did not occur. There was no fibrocellular thickening of the intima of calcified arteries. There was no more than a trace of newly formed basophilic intercellular matrix along the partly resorbed trabecular structure of cancellous bone. However, as soon as the animals were placed on a normal diet, the capacity for Vitamin D-induced formation of intercellular matrices was restored. The lead-induced inhibition of matrix production resembled an effect of Vitamin C deficiency in some species. The question was raised as to whether many toxic effects due to ingestion of lead and related metalions might have a common pathogenesis related to interference in production of intercellular materials among which collagen is perhaps the best-defined. There are 18 references.

-- Authors' summary

- 562 Thrombosis of Hepatic Veins Accompanying Carbon Tetrachloride Induced Cirrhosis. M.D. Reuber and E.L. Glover. Arch. Pathol. 83, 267-270 (March, 1967).

Buffalo strain inbred male and female rats, 4 days, 4 weeks, 12 weeks, 24 weeks, and 52 weeks of age, were injected subcutaneously with carbon tetrachloride twice weekly for 12 weeks. Hepatic vein thrombosis developed along with cirrhosis of the liver. Thrombosis was seen in the older animals more often than in the younger animals. It was also present in male rats more frequently than female rats. The thrombosis appeared to be initiated by proliferation of the endothelial cells of the veins. There are 26 references.

-- Authors' abst.

- 563 Dimethyl Sulfoxide and Experimental Oral Carcinogenesis in the Hamster Pouch. R.P. Elzay. Arch. Pathol. 83, 293-297 (March, 1967).

In a series of young Syrian hamsters the application of 7, 12-dimethylbenz-a-anthracene (DMBA) in dimethyl sulfoxide (DMSO) to cheek pouch epithelium did not result in a significant decrease of the latent period when compared to DMBA in mineral oil. Toxic effects of DMBA were not increased by addition of DMSO. Animals receiving DMBA in DMSO had markedly larger tumors clinically and histologically exhibited a higher incidence of epidermoid carcinoma than animals receiving DMBA in mineral oil. DMSO alone produced mild dyskeratosis but no carcinomatous transformation. Investigation does not clarify whether DMSO favorably interacts at the initiation or promotion stage of carcinogenesis. However, DMSO does augment DMBA carcinogenesis. There are 12 references.

-- Authors' abst.

- 564 Erythroleukemia After Chronic Benzene Intoxication. P. Kohli, H.E. Brunner, and W. Siegenthaler. Schweiz. Med. Wochschr. 97, 368-372 (March 25, 1967).

A 59-year-old shoemaker with a history of 19 years' exposure to benzene died of erythroleukemia (Di Guglielmo syndrome), with very marked terminal erythroblastosis after seven months of illness. Combined radioactive investigation of iron and chromium metabolism showed the severe macrocytic anemia to be due partly to hemolysis and partly to a disorder of erythrocyte maturation. The anemia was also aggravated by chronic blood loss due to thrombopenic hemorrhagic diathesis. The relation of erythroleukemia to chronic benzene intoxication can be regarded as definite. There is striking similarity of erythro- and ferrokinetics in erythroleukemia and pernicious anemia.

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

- 565 Urinary Hippuric Acid Excretion as an Index of Toluene Exposure. L.D. Pagnotto and L.M. Lieberman. Am. Ind. Hyg. Assn. J. 28, 129-134 (March-April, 1967).

A simple procedure is described for the analysis of hippuric acid in urine. The sample is extracted with an isopropyl alcohol-diethyl ether mixture, and the hippuric acid is measured in the extractant by ultraviolet spectrophotometry. The excretion of hippuric acid in urine as a metabolic product of toluene was studied in relation to its usefulness in industrial exposures to toluene. Good correlation of hippuric acid content of end-of-shift samples and toluene exposure was found in studies performed in leather-finishing and rubber-coating plants. The hippuric acid test was also found to be useful in measuring the adequacy of cartridge-type respirators in tank painting work. There are 20 references.

-- Authors' abst.

- 566 Overwhelming Salicylate Intoxication in an Adult. R.I. Levy.
Arch. Internal Med. 119, 399-402 (April, 1967).

A patient with overwhelming salicylate intoxication is described. Hemodialysis resulted in a fall in blood salicylate level, but with the development of an uncompensated respiratory alkalosis. This complicating acid-base disturbance was managed by paralyzing the patient's respiratory muscles with curare and taking over respirations at a more normal rate and volume. This procedure effectively raised the partial pressure of carbon dioxide, returning the blood pH to normal. The patient recovered, but sustained significant neurological changes.

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

- 567 Convulsions in Thiodan Workers. A Preliminary Report. T.S. Ely, et al.
J. Occ. Med. 9, 35-37 (Feb., 1967).

Thiodan (hexachloro-hexahydro-methano-2, 4, 3-benzodioxathiepin oxide) or endosulfan, is one of a group of highly toxic insecticides of the chlorinated hydrocarbon type. An isolated case of convulsions in a thiodan worker would be of minimal causal significance. However, the authors now have seen nine cases of convulsions in workers following thiodan handling and feel that it would be useful to summarize these events. An acute oral LD₅₀ of thiodan in male white rats has been determined at 43 mg./kg. For females it was 18 mg./kg. There is evidence that there is a significant variation in toxicity with species and with the vehicle used in administration. Subacute feeding of 30% of a lethal dose per day to rats did not lead to cumulative effects. The acute toxicity of thiodan by the skin route was about 90 mg./kg. in male rabbits when the material was made up as an aqueous suspension. Other vehicles, such as alcohol and xylene, would be expected to permit substantially greater absorption by this route. The compound is minimally irritating to the skin and eyes. By inhalation the LD₅₀ of thiodan was 0.35 mg./L. of air for male rats and 0.08 mg./L. of air for female rats. Exposure time was 4 hours. A table gives exposure and medical factors for the nine cases. Three representative cases are further described. Of the nine cases described, six were known not to have had a history of previous convulsions. Information on this point for the other three is not known. One or two associations between thiodan exposure and convulsions could be passed off as coincidental. With the number accumulated here, the authors feel that a causal relationship is highly likely. It is interesting to speculate on the route of entry. Protective clothing and respirators are reported in many of the cases. Protective clothing does not always protect, and respirators are not always worn effectively. One of the men had a beard. It is regrettable that the authors do not have more quantitative information on environmental air concentrations, since this could help establish whether the respiratory or skin route was the more significant.

INDUSTRIAL DUSTS

- 568 Symptoms Among Chilli Grinders. C.G. Uragoda.
Brit. J. Ind. Med. 24, 162-164 (April, 1967).

In countries where the consumption of chillies is high, the grinding of dried red chillies into a fine powder is a new industry. The majority of workers employed in this process suffer from sneezing, watering of the nose, and cough, all of which are maximal at the beginning of their employment. They develop tolerance within a variable period, after which this triad of symptoms occurs only when the atmosphere becomes heavily contaminated with chilli-powder or on inhalation of the volatilized capsaicin which is liberated when the roasted chillies are being ground. A burning sensation of the skin also occurs in most of the workers, especially when the skin is moist. Loss of weight is another common feature. All these symptoms are temporary, last only during the period of exposure, and do not produce radiological changes.

-- Author's abst.

- 569 A New Photometer for Aerosol Particle Size Analysis. D. Sinclair.
J. Air Poll. Control Assn. 17, 105-108 (Feb., 1967).

A recently developed photometer utilizes near-forward scattered light to count and size aerosol particles in the diameter range 0.3-17 microns. The particles are drawn through a 1-cu. mm. illuminated volume without entering the body of the optical chamber. Hence, purging is almost instantaneous, and number concentrations below 1,000,000/cu. ft. give less than 3% coincidences. The scattered light pulse from each particle is detected by a photomultiplier tube.

The resultant voltage pulses are amplified, measured by a series of ten discriminator circuits, and stored in a series of ten 5-decade electronic counters. At the end of a chosen period ranging from 1/3 to 30 min., a digital printer prints the number of particles at each diameter. At the end of the printout, the procedure automatically recycles. The instrument provides ten size classification, each successfully having a width ratio of 1.5 to 1. Greater precision is seldom practical since most aerosols contain particles of different refractive index, color, and shape, all of which affect the intensity of the scattered light. Calibration is accomplished with aerosols of uniform size such as spray-dried polystyrene and other latex suspensions, supplemented by calculations based on the Mie theory of light scattering. There are 19 references. -- Author's abstr.

- 570 Theoretical Considerations, Design, and Evaluation of a Cascade Impactor. J. J. Cohen and D. N. Montan. *Am. Ind. Hyg. Assn. J.* 28, 95-104 (March-April, 1967).

A cascade impactor of the multijet, round-hole design was developed that provides easy alteration of impactor stages and variation of air flow. The instrument was evaluated by empirical observation, correlation of mass distributions of aerosols as determined with the impactor versus membrane filter samples, determination of stage efficiencies, and case loss studies. There are 21 references. -- Authors' abstr.

- 571 Survey of Respiratory Performance of Steel Foundry Employees. J. Knowelden and R. H. Kastell. *Foundry Trade J. (London)* 121, 177-181 (Aug. 11, 1966).

A British Steel Founders' Association radiological survey carried out upon the respiratory tracts of steel foundry personnel is discussed. The objective was to discover if there was any evidence of disturbance in ventilatory functions associated with occupation, smoking habits, or radiological abnormality. Conclusions indicated that although individual men varied widely in their ventilatory capacity there was little difference between firms or occupations. A decline in capacity was associated with severe radiological abnormality or with heavy cigarette smoking but there are probably many other factors unconnected with steel foundry employment which accounted for difference in performances of individual men who were subjected to testing. -- Authors' summary

- 572 Industrial Dusts and Air Pollution. C. Drouin. *Ingenieur, L' (Montreal)* 57, 37-43 (Aug. 1966). French.

After a brief consideration of the definition of air pollution given by the American Medical Association in 1949, the author then considers various methods of controlling industrial dusts. Systems designed to protect workers from pneumoconioses and similar industrial diseases, in which the sources of contamination are enclosed under negative pressure or where local ventilation is applied, can be utilized to reduce air pollution and also to reduce the cost of its prevention. The formula for estimating the movement of particles in air is developed and a table is given of distance traveled by particles of certain sizes in relation to their initial velocity. Similarly, the theoretical basis is presented for processes involving sedimentation, dynamic precipitation, deposition by impact, collection by aqueous methods, filtration, and electrostatic precipitation. The author concludes that the apparatus chosen to prevent pollution of the air by dusts in a particular industry must be the right one and that chosen on the basis of cost alone may soon turn out to be a poor investment. Seven references are given. -- APCA Abstrs.

- 573 The Assessment of the Work Place—A Prerequisite to the Diagnosis of Occupational Chest Disease. K. M. Morse. *Am. Ind. Hyg. Assn. J.* 28, 135-143 (March-April, 1967).

The diagnosis of occupational chest disease requires both the evaluation of clinical findings and of the patient's history of exposure to industrial dusts. The dust exposure cannot be evaluated solely on the basis of current measurements. The industrial hygienist must apply his professional knowledge of procedures, materials and practices of past years to project the evaluation of the probable exposures over a period of years. The physician and industrial hygienist must work as a team. There are 8 references. -- Author's abstr.

- 574 Byssinosis Among Winders in the Cotton Industry. S. Mekky, S. A. Roach, and R. S. F. Schiller. Brit. J. Ind. Med. 24, 123-132 (April, 1967).

In a mill spinning coarse cotton the prevalence of byssinosis and other respiratory symptoms and the forced expiratory volume in one second (FEV_{1.0}), were measured in a group of 29 men and 117 women employed in the winding room. All the men and 95% of the women at risk were included. Dust concentrations, measured with a modified hexhlet at various work points in the winding room, ranged from 1.65 to 6.05 mg./cu.m. total dust. These concentrations are higher than 1.0 mg./cu.m., which is the threshold limit value for cotton dust recommended by the American Conference of Governmental Industrial Hygienists. The mean dust concentration was 3.48 mg./cu.m. compared with 2.85 mg./cu.m. in the card room of the same mill. The prevalence of byssinosis was 18.8% among the women and 13.8% among the men. A comparison among the women showed that those with symptoms of byssinosis had, on the average, significantly lower FEVs than women of similar age without such symptoms. Four women and one man with moderately severe symptoms of byssinosis showed evidence of permanent respiratory disability with effort intolerance and a substantial diminution in FEV_{1.0}. Further studies should be carried out in other winding rooms because, if these findings are repeated elsewhere, they would indicate the necessity for medical surveillance, dust control, and extending the compensation scheme to include winding room workers.

-- Authors' abst.

- 575 A Further Study of China Biscuit Placers in Stoke-on-Trent. E. Posner and M. C. S. Kennedy. Brit. J. Ind. Med. 24, 133-142 (April, 1967).

Powdered alumina has been used in the china industry of Stoke-on-Trent for first or "biscuit" placing for about 30 years. An investigation of 169 placers and oven oddmen, more than half of whom had been working with alumina for more than 15 years, revealed no cases of radiologically manifest pneumoconiosis which could be related to the inhalation of alumina. The results of the indirect maximum breathing capacity measured in 166 men were perhaps less convincing than the radiological evidence due to the different age structures of the groups examined. However, there was no evidence that the inhalation of alumina used in pottery manufacture causes pulmonary dysfunction.

-- Authors' abst.

- 576 Silicosis and Cancer. J. L. Nicod. Schweiz. Med. Wochschr. 97, 365-367 (March 25, 1967).

A survey of 382 autopsies in silicotics and persons without silicosis who were exposed to dust showed that there were 24 subjects with cancer among 353 silicotics and four among 29 non-silicotics. The tumor was localized in the digestive tract as often as in the lung. Moreover, there was no relation between the duration or form of dust exposure, the degree or form of dust exposure, the degree or form of silicosis of the lung, and the localization or type of cancer. The association of silicosis and cancer is, therefore, entirely fortuitous. All that can be held against silicosis is that it may have paved the way for lung cancer through recurrent bronchitis and metaplasia of the bronchial mucosa, which may have resulted.

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

- 577 Aspects of Pulmonary Mechanics in Arc Welders' Siderosis. D. C. Stanesco, et al. Brit. J. Ind. Med. 24, 143-147 (April, 1967).

Sixteen working welders with more than seven years' exposure and a chest radiograph suggestive of siderosis and 13 healthy unexposed men were studied. Each subject had a comprehensive medical and work history, physical examination, standard chest film, and pulmonary function investigation (lung volumes, ventilatory capacities, pulmonary compliance in static and dynamic conditions, specific compliance, and elastic work of breathing). Seven of the welders had some exertional dyspnea and three complained of cough. Although spirometric values were generally within the normal range, the arc welders had a statistically significant reduction in static and functional compliance. Seven had a functional compliance under the lower limit of the control group. Differences in elastic work of breathing and specific compliance were not significant. The possible causes of pulmonary function impairment in welders are discussed.

-- Authors' abst.

IN RE: ABRAMS November 1992

HHBB-0020160

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 578 Studies and Recent Advances in Military Problems of Heat Acclimatization. D. Minard. Military Med. 132, 306-315 (April, 1967).

High rates of heat casualties are observed in non-acclimatized infantry units operating in hot climates. There is a growing body of evidence that the combat performance of others in the same units who are not actual casualties may nevertheless be seriously impaired. Travel fatigue, dehydration, caloric deficit and diarrheal disease are often contributing factors. Through gradual exposure to heat and exercise unacclimatized recruits training under conditions of high seasonal heat can acquire heat tolerance without incurring high rate of heat casualties. Similar procedures should be applied to other categories of unacclimatized trainees. Further studies of methods to increase heat tolerance artificially are needed. Physical conditioning exercises conducted in a cool environment appear to improve ability to work in the heat possibly by promoting more efficient cardiocirculatory function but the enhancement of sweating observed in heat acclimatization is lacking. The deleterious effect of heat stress on performance of military tasks requiring physical stamina has been amply demonstrated in controlled studies on unacclimatized men. The extent to which performance decrement occurs in tasks requiring sensori-motor skills, judgment, and vigilance needs further investigation. There are 14 references.

-- Author's conclusions

- 579 Hearing Discrimination in Hyperbaric Air. J. Adolfson and E. Fluor. Aerospace Med. 38, 174-175 (Feb., 1967).

In order to determine to what extent the hearing discrimination was influenced by hyperbaric air intoxication, 23 drivers were tested by means of speech audiometry in a pressure chamber at 4 ata, 7 ata, and 11 ata. It was concluded that even if the sound intensity was raised far above the hearing threshold the prolonged associative reaction caused by hyperbaric air intoxication led to severe difficulties for a diver to apprehend simple common words. It was also suggested that this state could be a reason for a diver not to obey orders from the surface when diving at depths greater than 60 meters. No adaptation to hyperbaric environment was found in this investigation.

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

- 580 A Noise and Hearing Survey of Earth-Moving Equipment Operators. P. LaBenz, A. Cohen, and B. Pearson. Am. Ind. Hyg. Assn. J. 28, 117-128 (March-April, 1967).

Noise and hearing were surveyed at 16 construction sites, involving heavy earth-moving equipment operations. Over-all noise levels were 90-120 db sound pressure level (SPL) with most energy below 600 cycles per second (CPS). All measured noises exceeded 8-hour exposure criteria in one or more octave bands. Equipment operators showed hearing impairment which was worse at higher frequencies and which increased with years of employment even though corrected for age. Temporary hearing threshold shifts were found following single workday noise exposures. Survey findings indicated the need for noise control and audiometric monitoring. There are 13 references.

-- Authors' abst.

- 581 Hearing Threshold of a Non-Noise-Exposed Population in Dundee. W. Taylor, J. Pearson, and A. Mair. Brit. J. Ind. Med. 24, 114-122 (April, 1967).

In order to provide a control population for a previous investigation of noise-induced hearing loss in a population of female jute weavers (Taylor, Pearson, Mair, and Burns, J. Acoust. Soc. Am. 38, 113 (1965)) a survey was conducted on the hearing thresholds of 296 school teachers in Dundee, Scotland, by pure tone earphone listening. This population, although not exposed to industrial noise, is subjected to city noise and differs, therefore, from the rural population of Hinchcliffe, (Acustica 9, 303 (1959)), whose presbycusis data have been used in previous studies. The results show that Dundee female school teachers do not conform to British Standard in the age group 18-24 years. The presbycusis data (18-65 years age group), however, show close agreement with those of Hinchcliffe (Acustica 9, 303 (1959)) and Corso (Arch. Otolaryngol 77, 385 (1963)). The distributions of hearing threshold observed were normal.

-- Authors' abst.

- 582 Evaluation of the Mechanism of Some Physical Effects of Lasers on Tissue. Janice A. Mendelson, N.D. Cook, and J.R. Dearman. *Military Med.* 132, 270-281 (April, 1967).

The purpose of these studies has been to determine whether there is any significant hazard to man should he accidentally stand in front of a laser striking him elsewhere than the eyes. It is important to note that all emphasis in this work concerns acute injury, of surgical significance. It does not consider possible alterations of cellular metabolism following single or repeated exposure that might be of interest in studies of carcinogenesis, nor other effects of chronic exposure. The authors discuss the subject under the following headings: Penetrability of Laser Light; Characteristics of the Medium; Focusing; Thermal Effects; and Pressure Waves. They conclude, that except for the eyes, from the surgical standpoint, there is no reason to expect other than superficial damage from accidental exposure of man or large animals to lasers. Experimental data tends to confirm the theoretical principles involved. There are 28 references.

RADIOACTIVITY AND X-RADIATION

- 583 Some Psychomotor and Physiological Tests on Humans Exposed to Air Ions. R.D. McDonald, C.H. Bachman, and P. J. Lorenz. *Aerospace Med.* 38, 145-148 (Feb., 1967).

Humans were exposed to air ions by inhalation only. The ion current to each subject was measured. Both psychomotor and physiological tests were performed with ions of both polarities. Reaction time measurements under ionization were ambiguous. In a vigilance task both negative ions and positive ions reduced the number of omissions, the positives being most effective. Neither polarity affected the heart rate. Reduction in respiration rates occurred for both polarities of ions as well as the control during the ion exposure. The reduction for positive ions was greater than for the control, the reduction for negatives was less than for the control. Measurements of DC potential between forehead and ear showed no correlation with ion treatment.

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

ENVIRONMENTAL MEASUREMENTS

- 584 Standardization of Chemical Methods in Air Sampling. R.G. Keenan. *Am. Ind. Hyg. Assn. J.* 28, 144-147 (March-April, 1967).

This paper presents a brief discussion of the separate and combined efforts over the past 25 years of six professional organizations in the United States leading toward standardization of methods of analysis for atmospheric samples. The author then discusses, in greater detail, the modus operandi, the accomplishments, and his concept of the future program of the Committee on Recommended Analytical Methods of the American Conference of Governmental Industrial Hygienists. Four references are given.

-- Author's abst.

PREVENTIVE ENGINEERING

- 585 A Penchant for Partnership—Safety and the Research Scientist. B.G. Bonner. *J. Am. Soc. Safety Eng.* 12, 13-17 (May, 1967).

Safety is of special concern to the research scientist due to the high level of research activity in industry. Research, if not properly conducted, often involves potential dangers to the research scientist, to his fellow workers, and to the community. Especially since research changes constantly, and the researcher may sometimes forget caution or not be aware of danger. The safety professional can persuade the research scientist to perform his work in a safe manner by motivation and the adoption of proven safe practices. Motivation can be accomplished if you: (1) Get to know the research scientist. (2) Identify yourself. (3) Seek his advice. (4) Establish good public relations. Proven safe practices can be emphasized if you: (1) Adapt safe practices to the specific work assignment. (2) Explain the reason. (3) Check up to ensure that these practices are being followed. (4) Re-adapt them to conform with changes in experimental work.

-- Author's summary

- 586 An Evaluation of the Safety of Shrouded Nozzles Used on High-Pressure Greasing Equipment. R. Morley. Brit. J. Ind. Med. 24, 152-155 (April, 1967).

High-pressure grease guns using a shrouded nozzle were "fired" from varying distances at amputated lower limbs to determine the pressure at which penetration of the skin occurred. It was concluded that a shrouded nozzle would not normally give rise to injury if the grease pressure was below 7,000 lbf./sq.in. (492 kgf./sq.cm.). -- Authors' abst.

- 587 Industrial Solvents—A Safety Professional's Evaluation of the Hazards Associated With Their Use. J. Van Namee. J. Am. Soc. Safety Eng. 12, 18-21 (May, 1967).

Industrial solvents can be used safely in any operation provided an iron-clad procedure exists whereby every solvent used is first evaluated for safety. Then, an adequate control program must be established to assure that the hazards are either eliminated or greatly minimized. The safety professional is the focal point of this program. Through him, management should seek advice concerning the establishment of programs to assure that the hazards of all solvent materials coming into the plant are identified and that adequate controls are established to optimize their safe usage. Because no single control measure exists which can guarantee the safe use of solvents, the safety professional must review each new solvent that is introduced into the plant and also each new application to which existing solvents will be used. Management must also establish a policy requiring consultation by the safety professional in connection with all process specifications. In addition, the purchasing department should be required to alert the safety professional whenever a requisition is submitted for the purchase of new or different solvents. Among the more important process engineering control items that will need consideration are: (a) substitution of a less hazardous solvent; (b) utilization of process or equipment enclosure; (c) provision of proper and adequate ventilation; (d) elimination of sources of ignition; and (e) provision of inert gas blanketing. After the establishment of these engineering controls, the safety professional should concern himself with the adequacy of such general control procedures as: (a) employee education concerning the hazardous nature of the solvent; (b) the adequacy of a medical control program; (c) provision and use of personal protective equipment; and (d) maintenance of good housekeeping conditions. The safety professional must work in close cooperation with the industrial hygienist and the industrial physician to successfully achieve their common goal. There are 9 references.

-- Author's conclusion

- 588 Are There Still Local Exhaust Ventilation Problems? J.M. Kane. Am. Ind. Hyg. Assn. J. 28, 166-170 (March-April, 1967).

There are many areas in which existing local exhaust ventilation design criteria, control methods, and maintenance of control could be improved. Current practice, based on quite old data, requires close scrutiny against changing conditions and advances in technology. Innovations during such an interval often go unnoticed; they deserve more extensive reporting if the practice of exhaust ventilation is to be improved. The problems of high-speed grinder control, hot operation exhaust, operating cost reduction, the use of air jets, and exhaust system maintenance are discussed.

-- Author's abst.

- 589 Smoke Puff Generator for Room Air Movement Studies. P. Kotrappa and D.P. Bhanti. Am. Ind. Hyg. Assn. J. 28, 171-174 (March-April, 1967).

A simple portable smoke generator to produce ammonium chloride smoke has been designed. The unit has been found to produce smoke of about 0.7 micron mass mean diameter with 1.12 geometric standard deviation. Furthermore, it has high obscuring power and long settling time suitable for studying room ventilations. The unit can be operated continuously over a period of three hours at 4.5 liters per minute before recharging. The generator is inexpensive, uses common chemicals and weighs about 350 gm., when freshly charged.

-- Authors' abst.

COMMUNITY AIR HYGIENE

- 590 Air Pollution Measurement Records Lost Dollars. R.K. Johnson. ISAJ 13, 40-42 (Sept., 1966).

Continuous recording of particulate emission from stacks demonstrates combustion efficiency, indicates efficiency of dust collectors, and shows whether a plant meets air pollution codes.

Photoelectric tubes, thermopiles, or bolometers may be used as sensing devices, and continuous monitoring may be calibrated directly in Ringelmann units. Two examples of use of the monitoring devices in stacks at pulp recovery units are given. Economic losses caused by inefficient combustion and dust collection are calculated. -- APCA Absts.

- 591 Analyzing Air Pollutant Concentration and Dosage Data. R.I. Larsen, et al. J. Air Poll. Control Assn. 17, 85-93 (Feb., 1967).

Continuous air pollutant concentration data have been analyzed for carbon monoxide, hydrocarbons, nitric oxide, nitrogen dioxide, nitrogen oxides, oxidant, and sulfur dioxide in Chicago, Cincinnati, Los Angeles, Philadelphia, San Francisco, and Washington for years 1962 through 1964. Concentrations are approximately lognormally distributed for all pollutants in all cities for all averaging times. Maximum concentration is inversely proportional to averaging time to an exponent. Air pollutant dosage (concentrations times time) above various threshold concentrations has been computed for all of the pollutants in all the cities for year 1964. Equations have been developed from these analyses to predict the frequency of occurrence of air pollutant dosages of various intensities as a function of the geometric mean and standard geometric deviation. An example is shown for predicting the number of occurrences of sulfur dioxide dosages that might cause acute plant damage. Five references are given. -- Authors' abst.

- 592 The Changing Pattern of Air Pollution in the United States. A.C. Stern. Am. Ind. Hyg. Assn. J. 28, 161-165 (March-April, 1967).

In the past our principal concern has been with particulate emissions—smoke, fly ash, cinders, and dust. Nationwide, our regulatory and abatement practices reflect this early preoccupation. A growing concern are the gaseous emissions and the gaseous products resulting from atmospheric photochemical reactions. This is reflected, for example, in our present preoccupation with the automobile. Although interest in gaseous and particulate emissions will continue in the future, more attention will be paid to the particulate products resulting from atmospheric photochemical reactions. This will come from a recognition that not until the visible haze is lifted from our cities will they be truly livable. Nine references are given. -- Author's abst.

- 593 Community Studies of the Health Effects of Air Pollution. D.O. Anderson and B.G. Ferris. Can. J. Public Health 57, 209-220 (May, 1966).

Aspects of the standard respiratory survey, which has been used in a number of the community studies are reviewed. The authors designate areas of the survey which can significantly affect the reliability and validity of the observations. The three major uses for the community respiratory survey in America are discussed. The surveys have indicated that the prevalence of chronic respiratory disease is multifactorial in etiology, but they are limited in usefulness as the basic instrument to compare communities of different air quality. -- APCA Absts.

- 594 The Use of Meteorological Towers in Urban Air Pollution Programs. R.E. Munn and I.M. Stewart. J. Air Poll. Control Assn. 17, 98-101 (Feb., 1967).

Average values of temperature difference and wind by hour of the day and month of the year have been presented for three 200-ft. towers: in Montreal (built-up area), Ottawa (suburban exposure), and Sarnia (rural environment). Inversion intensities are greatest in Sarnia and smallest in Montreal, as a result of the urban heat island effect. The best location for a tower depends on local topography as well as upon the uses to be made of the data. In the absence of lakes or valleys, there is little to choose between a country or an urban site; however, the analyst must be aware of the fact that the country tower will at times be within the urban heat island when winds are blowing from the city. It would, of course, be desirable to instrument several towers in and around one particular city to investigate in detail the mesoscale features caused by urban areas. Nine references are given. -- Authors' conclusion.

- 595 The Importance of Public Education in Air Pollution Control. I.L. Auerbach and K. Flieger. J. Air Poll. Control Assn. 17, 102-104 (Feb., 1967).

Air pollution control efforts by federal, state, regional, and municipal agencies and by industry have expanded tremendously within the past few years. That this increased effort is a reflection

of elevated public understanding of the problem and rising public insistence upon action is inescapable. Through all media of mass communication, through the efforts of public service organizations, and through the actions and pronouncements of public officials at all levels of government, the popular desire for better control of air pollution is being expressed with mounting frequency and increasing impact. This fact, in addition to generating an unprecedented expansion in control activity, requires that communication between the individuals and agencies responsible for air pollution control and the citizen, to whom this responsibility is owed, be open, comprehensive, and forthright. Any other response to the need for public information and education concerning the problem of air pollution must in the long run seriously jeopardize the air pollution control effort.

-- Authors' abst.

- 596 California Experience With Air Quality Standards. J. A. Maga.
J. Air Poll. Control Assn. 17, 109-111 (Feb., 1967).

Air quality standards have existed in California for almost six years. They have become an important part of the state's air pollution control program. The two principal uses of the standards have been to establish the goals for controlling motor vehicle emissions and to provide a basis for evaluating air quality throughout the state. The standards have also proved to be valuable as a means of communicating on air pollution problems with legislators, administrators, the press, the public, and dischargers of pollutants. Lack of adequate data on the effects of varying concentrations of contaminants of concern in air pollution is a serious limitation in any effort to establish air quality standards. It is important that this data be obtained. The concept of employing air quality standards as administrative goals is not unique to the air pollution field but is part of a broad trend to utilize standards for insuring a satisfactory environment. Those engaged in the air pollution field can expect to see increasing emphasis on such standards. Air quality standards do not provide a magic formula for eliminating air pollution; they are but one element in a comprehensive program. They have limitations and are no better than the data upon which they are based. The standards, however, can play an important role in preserving satisfactory air quality and protecting man's health. There are five references.

-- Cond. from author's abst.

- 597 Air Pollution in Alberta. S. L. Dobko.
Can. J. Public Health 57, 84-86 (Feb., 1966).

The growth of the petroleum industry in Alberta province which necessitated regulations for air pollution control is discussed. Regulations, adopted in September 1961 cover four types of pollutants—dust, smoke, odorous material, and toxic or noxious material. All new industry plans must meet these regulations and existing industry must comply with them within 5 years. Stack monitoring and two types of area monitoring to detect violations of the regulations are described.

-- APCA Absts.

- 598 Experience With the New York State Air Pollution Control Rules—Industrial Sources.
S. Marlow and B. Feiner. Am. Ind. Hyg. Assn. J. 28, 184-190 (March-April, 1967).

This paper describes the experience of the New York State Department of Labor in the administration of the New York State Air Pollution Control Law as it applies to industrial sources. The rules to prevent new air pollution, prepared by the Air Pollution Control Board are explained. Plan review procedures are outlined, and bases of approval are given. The advantages of review of a single set of plans for in-plant and air pollution control by an established industrial hygiene division are discussed.

-- Authors' abst.

- 599 Eliminating Smell From a Refinery. Anon.
Petroleum (London) 29, 148-150 (July-Aug., 1966).

The methods used for eliminating smell from a refinery are described. Even after use of an elaborate water purification system, schematically presented in this article, odor remained. The odor was traced to the waste water collection pit. It was found that a triple layer of Allplas polypropylene 45 mm. diameter balls spread over the surface of the water in the collecting pit eliminated the odors. A single layer of balls reduced the amount of fuel needed to maintain a given solution temperature by 70%, and reduced evaporation by 88%.

-- APCA Absts.

- 600 The Effects of Ozone on Tobacco and Pinto Bean as Conditioned by Several Ecological Factors. W.W. Heck and J.A. Dunning. *J. Air Poll. Control Assn.* 17, 112-114 (Feb., 1967).

The sensitivity of tobacco and pinto bean to ozone, as an air pollutant, is increased by growing plants in a shortened photoperiod under reduced light intensity and in a light potting mix. Sensitivity also is influenced by carbon dioxide concentration, time of day, and age of plant at time of exposure. Plants are more severely injured by a given dose under continuous exposure than when the exposure is split into two time periods. Tobacco shows cumulative development of injury when exposed to low concentrations intermittently over several days. There are 14 references. -- Authors' abst.

- 601 Evaluation of Ethylene as an Air Pollutant Affecting Plant Life. G.D. Clayton and T.S. Platt. *Am. Ind. Hyg. Assn. J.* 28, 151-160 (March-April, 1967).

A comprehensive survey of the literature reveals that ethylene has been clearly implicated as an air pollutant only for certain greenhouse plants. Ethylene is produced naturally by some biologic systems and may cause some plant damage. Most studies have been in closed systems with shifts in gas concentrations occurring. Adequate data are lacking on the response of field-grown plants to ethylene as an air pollutant. There are 50 references. -- Authors' abst.

MANAGEMENT ASPECTS

- 602 Shift and Day Work. A Comparison of Sickness Absence, Lateness, and Other Absence Behavior at an Oil Refinery From 1962 to 1965. P. J. Taylor. *Brit. J. Ind. Med.* 24, 93-102 (April, 1967).

Despite the increasing use of continuous process shift work in modern industry, few studies on the medical aspects of shift work can be found in recent literature of occupational health. Physiologists have shown that the ability of the body to adjust its circadian rhythms to alteration in hours of work or sleep can take up to a month. The usual type of shift work in industry involves weekly changes of hours, and thus on theoretical grounds at least this may not be the most suitable frequency for shift changes. Sickness absence of male refinery workers has been studied over a four-year period. The figures show that continuous three-cycle shift workers have consistently and significantly lower rates of sickness than day workers in similar occupations. The annual inception rate (spells) standardized for age was 108% for shift workers and 182% for day workers, and the average annual duration per man was 11 days for shift workers and 18 days for day workers, although the average length of spell was slightly longer among shift workers. As far as is known, such a difference has not been described before in detail. Age-related lateness and absenteeism have been measured and show similar wide differences between the two groups. Although both types of workers are largely self-selected, the difference is not due to medical selection or to an excess of any one type of disease in day workers. Over three-quarters of 150 shift workers interviewed stated that they preferred shift work hours and that sleeping difficulties were not common. It is suggested that the main reasons for the difference between shift and day workers' sickness absence lie in the degree of personal involvement in the work and in the social structure of the working group. -- Author's abst.

ACCIDENTS AND PREVENTION

- 603 Injuries in Traffic Accidents. G.A. Ryan. *New Engl. J. Med.* 276, 1066-1076 (May 11, 1967).

Some of the important findings concerning injuries and injury production in a study of injury-producing traffic accidents in Adelaide, South Australia, are presented. This study was done by a team consisting of a physician and an engineer, with the aim of obtaining data, in Australian conditions, basic to the design of roads, vehicles, and traffic organization by the objective on-the-spot study of the medical and engineering aspects of injury-producing accidents. The criterion of an injury-producing accident was that an ambulance be called to it. With the use of a relatively unbiased sampling method 408 accidents were collected in two periods, March 4 to November 5, 1963, and February 3 to August 30, 1964. This represents a 12.3 per cent sample of the 3302 accidents occurring in these two periods. The 408 accidents involved 1315 persons, of whom 1029 were car occupants, 85 truck occupants, 74 motorcycle riders and passengers, 45 pedal cyclists, and 82 pedestrians. There were 17 deaths as a result of injuries

received—2 car occupants, 1 motorcyclist, 3 pedal cyclists and 11 pedestrians. Of collisions between cars, 75 per cent happened at intersections. Driver education could be made more effective if the importance of specific accident patterns were explained. The wearing of effective helmets for motorcycle riders, and seat belts with upper-torso restraint (that is, three-point seat belts for car occupants), appears to be the most effective way of preventing injuries. Since it is estimated that there is 1 chance in 3 that a car will be involved in an injury-producing accident over ten years, there seems to be great potential in reducing injuries by appropriate vehicle design. There are 20 references.

- 604 Myocardial Contusion Due to Steering Wheel Injury. D. Kahn.
J. Am. Med. Assn. 200, 255-257 (April 17, 1967).

Myocardial contusion occurred in a 17-year-old boy following a nonpenetrating chest injury. It is emphasized that this may be a relatively silent lesion, overshadowed by associated injuries, but that it will be encountered with increasing frequency in this "age of the auto". The use of seat belts, shoulder harnesses, and collapsible steering columns may prevent many of these chest injuries. Seven references are given. -- Author's summary

- 605 Seat-Belt Fractures of the Spine and Sternum. B.D. Fletcher and B.G. Brogdon.
J. Am. Med. Assn. 200, 167-168 (April 10, 1967).

Seat belts can prevent serious injury due to ejection or buffeting during automobile accidents, but care must be taken in their application and positioning. Improperly positioned or inadequately tightened, lap-type seat belts may act as a central fulcrum to produce transverse fractures of the lumbar vertebrae upon sudden deceleration. The "bandolier" or shoulder-type safety belt will prevent acute flexion of the spine but may be responsible for fractures of the sternum and rib cage, trauma to intrathoracic viscera, or rupture of the spleen and liver. There are 8 references. -- Authors' summary

MISCELLANEOUS

- 606 Treating Parathion Wastes. C.N. Stutz.
Chem. Eng. Progr. 62, 82-84 (Oct., 1966).

Pilot plant tests were made of parathion wastes combined with domestic wastes to assure the city that the wastes can be treated successfully in the municipal activated sludge treatment plant. Expansion of the parathion plant requires the development of design criteria for a pretreatment plant. Incineration of residues and scrubbing and demisting of the off-gases are practical. Limestone neutralization of the acid streams followed by blending with alkaline streams before biological treatment is used to control the pH. -- APCA Absts.

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