



Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL

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INDUSTRIAL HYGIENE FOUNDATION

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Summary of employment of the physically handicapped is discussed in Abst. No. 324.

Abst. No. 325 reports on disability, old age, and employment.

Recent advances on cardiac revascularization are reviewed in Abst. No. 328.

Abst. No. 330 is concerned with eye problems in industry.

Information on viral infections and the common cold is presented in Abst. No. 334.

A report on genetic bases of susceptibility and resistance to toxic agents is given in Abst. No. 343.

A study on contact eczema caused by true teak is given in Abst. No. 346.

Abst. No. 351 is concerned with long-term effects of sulfur dioxide exposure in pulp mills.

Abst. No. 353 investigates arsenic poisoning in a slag washing process.

Environmental factors in childhood lead poisoning is the title of Abst. No. 363.

See Abst. No. 376 for details on peripheral tumors in asbestosis.

For principles concerning the control of environmental laser hazards consult Abst. No. 377.

Data concerning motorist exposure to aldehydes from diesel powered buses are given in Abst. No. 388.

Natural phenomena in air pollution is the topic of Abst. No. 397.

Pulmonary function impairment produced by atmospheric pollution is discussed in Abst. No. 401.

Abst. No. 409 reviews the concept of accident proneness.

FOUNDATION FACTS

AN IHF EXHIBIT consisting of 27 bound volumes of the Industrial Hygiene Digest (1937-1963) was displayed at the American Industrial Health Conference in Pittsburgh and at the American Industrial Hygiene Association meeting in Philadelphia, to show the value of the Digest as a complete reference, especially when kept together.

A MONOGRAPH entitled "Pulmonary Deposition and Retention of Inhaled Aerosols" by Paul Gross, M.D. and Professor Theodore F. Hatch has just been published. This was prepared under the direction of the American Industrial Hygiene Association for the Division of Technical Information, U.S. Atomic Energy Commission. This concise monograph on pulmonary deposition and retention of aerosols should therefore be welcomed by industrial hygienists, health physicists, microbiologists, industrial physicians and medical specialists in radiation health, infectious diseases and air pollution. Copies are available from the Academic Press, 111 Fifth Ave., New York, New York 10003 at \$5.95 clothbound, or \$3.45 paperbound.

NEW REPRINTS AVAILABLE UPON REQUEST. "Natural Occurrence of Lead" by Robert T. P. deTreville, M.D., Arch. Environmental Health 8, 212-221 (February 1964); and "Pneumoconiosis: The Morphology of the Inert Dust Reaction" by Paul Gross, M.D., Beitr. Silikose-Forsch. S-Bd Grundfragen Silikoseforsch. Bd 5, 2-73-283 (1963).

29th ANNUAL MEETING
OCTOBER 21-22, 1964

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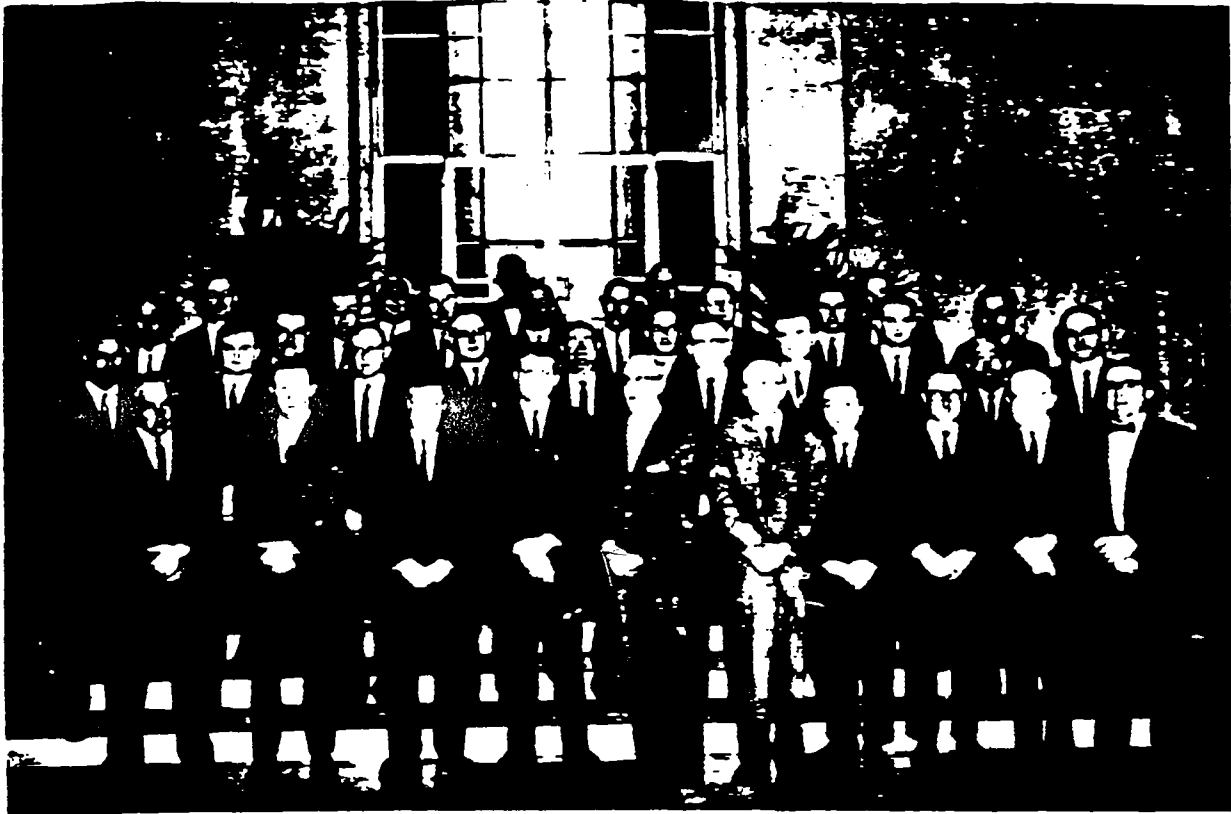
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6th NATIONAL INDUSTRIAL SAND ASSOCIATION SEMINAR



On March 19 and 20 the 6th Seminar, arranged by the Industrial Hygiene Foundation for National Industrial Sand Association members, was held at Mellon Institute. The purpose of this program was to give individual industrial sand companies an opportunity to obtain more useful information on health, safety, and compensation programs in industry. Guest speakers included: Dr. Miles O. Colwell, Aluminum Company of America; Mr. William C. Hartman, Squire, Sanders & Dempsey; Mr. W.A. Kipp, Universal Atlas Cement Division, U.S. Steel Corp.; and Dr. Bryce Templeton, University of Pittsburgh School of Medicine. The Foundation representatives on the program were: Dr. Robert T. P. deTreville, Dr. Paul Gross and Professor Theodore F. Hatch.

The program was well received by all in attendance. 01-132 2215

INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

311 AMA Annual Convention.

The American Medical Association's 113th Annual Convention will be held June 21-25 in San Francisco. An attendance of about 40,000, including more than 14,000 physicians is expected. A well-balanced scientific program will be presented for the physicians. J. Arnold Barger, M.D., Temple, Texas, chairman of the AMA Council on Postgraduate Programs, commented that the meeting promises to be "an outstanding contribution to graduate medical education."

-- AMA News 7, 1 (Feb. 17, 1964)

312 Annual Meeting of Air Pollution Control Association.

James H. Huguet, Ethyl Corporation, Technical Program Chairman for APCA's 57th Annual Meeting to be held in Houston, Texas, at the Shamrock Hilton Hotel, June 21 to 25, 1964, has reported a record number of offerings of papers for the technical program. A total number of 129 abstracts had been received in time to be reviewed by members of his committee at a meeting held in New Orleans, on December 13, 1963. The tentative preliminary program outline was prepared at this time and schedules a keynote session on Monday morning and three concurrent sessions on Monday afternoon, Tuesday, Wednesday and Thursday mornings and afternoons. Based on recommendations of previous Annual Meeting Committees, plant trips will be conducted concurrently with the Tuesday and Wednesday afternoon sessions this year.

-- J. Air Poll. Control Assn. 14, 70 (Feb. 1964)

313 International Diabetes Federation.

The Fifth Congress of the International Diabetes Federation will convene in Toronto, Canada, July 20 to 24, 1964. The American Diabetes Association is participating in the Fifth Congress, instead of its regular postgraduate program and annual meeting in 1964. The Congress is being held under the joint sponsorship of the Canadian Diabetic Association and the University of Toronto. The entire program is so arranged that all workers interested in diabetes should find an area of particular interest. More information concerning the Congress, including registration and abstract forms, is enclosed in a brochure which will be sent upon request. Such requests should be mailed to: The Executive Secretary, International Diabetes Federation Fifth Congress, 477 Mount Pleasant Road, Toronto 7, Ontario, Canada.

-- Am. J. Clin. Pathol. 41, 211 (Feb. 1964)

314 Three Top Physicians Endorse Fluoridation.

Three of the most widely known physicians in the nation have publicly endorsed the use of fluoridated drinking water, according to "California's Health". They are Dr. C. W. Mayo, head of the Mayo Clinic, Dr. Benjamin Spock, pediatrician, and Dr. Paul Dudley White, cardiologist. Dr. Mayo cites water fluoridation as a great advance in preventive medicine in a statement endorsing the measure. Dr. Spock considers fluoridation "A wonderful preventive measure which does not depend on the parents' means or on their conscientiousness or on the availability of dentists." Dr. White states that "Elderly people with (tired hearts) need have no fear of fluoridated water. It is safe for all." There are presently about 51,000,000 people in the United States drinking fluoridated water. When New York City begins fluoridation later this year the total will jump to 59,000,000.

--Am. Soc. Civil Eng., Div. News 90, 1964-6-12 (Feb. 1964)

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315 HEW To Handle Information on Air Pollution.

On January 24, Dr. Jerome B. Wiesner, then director of the Office of Science and Technology, announced that the Department of Health, Education and Welfare has been assigned responsibility within the Federal Government for assuring full and adequate handling of scientific information in air pollution prevention and control. This action is consistent with the recently enacted Public Law 88-206 which assigns to HEW several responsibilities in air pollution regulation and research and development. The action is a significant step in coordinating federally generated research information. It is expected to set the precedent for a series of delegations to individual Government agencies, whereby the agency will act as a clearing house for the research documents and data resulting from the activities of all agencies engaged in similar scientific or engineering work. This concept is one of the major recommendations of a report entitled Science Government, and Information (popularly known as the Weinberg Report) issued in January 1963 by President Kennedy. The Department of Health, Education and Welfare will collect data and information from both Government and non-government facilities significantly involved in air pollution research, and will organize this information, consolidate it, and provide state-of-the-art summaries. The service will be available to the public as well as to officials of other Government agencies.

--Sci. Information Notes 6, 1 (Feb.-March, 1964)

COMING EVENTS

- | | | |
|-----|-----------|--|
| 316 | May 1-2 | Association of Clinical Scientists, Philadelphia, Pa. |
| | May 1-2 | Congress on Environmental Health Problems, Chicago, Ill. |
| | May 3 | American Federation for Clinical Research, Atlantic City, N. J. |
| | May 3-7 | American Society for Microbiology, 64th Annual Meeting, Washington, D. C. |
| | May 3-7 | Electrochemical Society, Spring Meeting, Toronto, Ontario. |
| | May 4-5 | New York Academy of Sciences, The Laser, New York, N. Y. |
| | May 4-6 | Institute of Nuclear Materials Management, 5th Annual Meeting, Pittsburgh, Pa. |
| | May 5-6 | Association of American Physicians, Atlantic City, N. J. |
| | May 5-7 | 19th Purdue Industrial Waste Conference, Lafayette, Ind. |
| | May 5-9 | American Association on Mental Deficiency, Kansas City, Mo. |
| | May 6-8 | National Society for Prevention of Blindness, Miami Beach, Fla. |
| | May 7 | Society of Plastics Engineers, Buffalo, N. Y. |
| | May 7-8 | 4th Conference on Vacuum Microbalance Techniques, Pittsburgh, Pa. |
| | May 10-12 | American Institute of Chemists, New York, N. Y. |
| | May 11-12 | American Coke and Coal Chemicals Institute, Eastern Regional Meeting, Rye, N. Y. |
| | May 11-13 | American Petroleum Institute, 29th Midyear Meeting of the Division of Refining, St. Louis, Mo. |
| | May 11-14 | Aerospace Medical Association, Bal Harbour, Fla. |
| | May 13-16 | American Association of Plastic Surgeons, Chicago, Ill. |
| | May 17-20 | American Institute of Chemical Engineers, 53rd National Meeting, Pittsburgh, Pa. |
| | May 18-20 | Chemical Specialties Manufacturers Association, 50th Midyear Meeting, Chicago, Ill. |
| | May 18-20 | Radiation Research Society, 12th Annual Meeting, Miami Beach, Fla. |
| | May 18-22 | National Fire Protection Association, 68th Annual Meeting, Dallas, Tex. |
| | May 24-28 | Institute of Food Technologists, 24th Annual Meeting, Washington, D. C. |
| | May 25-27 | American Thoracic Society, New York, N. Y. |
| | May 28-30 | American Ophthalmological Society, Hot Springs, Va. |

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OCCUPATIONAL DISEASE STATISTICS

317 Occupational Disease Statistics. (Cases reported to the respective Health Departments).

	<u>Conn.</u> <u>Jan.</u>	<u>Pa.</u> <u>Feb.-Mar.</u>	<u>Tenn.</u> <u>Feb.</u>	<u>Total</u>
Anthraco-silicosis		40		40
Anthraco-silicosis (suspected)		8		8
Bronchitis (grain dust)			1	1
Carbon monoxide poisoning			1	1
Chlorine poisoning			1	1
Dermatitis	29*	26	7	62
Dermatitis (suspected)		1		1
Emphysema (suspected)		1		1
Fumes (unidentified)		5		5
Lead intoxication		4		4
Nitrogen dioxide poisoning	1			1
Pneumoconiosis		61		61
Pneumoconiosis (suspected)		51		51
Pneumonitis		1		1
Respiratory irritation		5		5
Silicosis		16		16
Silicosis (suspected)		60		60
Silico-TB.(suspected)		1		1
Thesauriosis (suspected)		1		1
Xylol fume poisoning			1	1
Total	<u>30</u>	<u>281</u>	<u>11</u>	<u>322</u>

* Causes are listed as follows:

Connecticut: Occupational dermatitis due to plants: poison ivy 2; occupational dermatitis due to oils and greases (and metal cutting compounds) 6; occupational dermatitis due to solvents 5; occupational dermatitis due to other chemicals: miscellaneous 3, photography chemicals 1, plating chemicals 1, synthetic resins or resin (plastic) compounds 4, unspecified 1; occupational dermatitis—other: friction 1, infection 2, soaps or detergents 3.

RESULTS OF 1963 DIVISION OF OCCUPATIONAL
HEALTH SURVEYS FOR PENNSYLVANIA

Pneumoconiosis	883
Pneumoconiosis(suspected)	<u>181</u>
Total	1064

LEGAL DEVELOPMENTS

318 Law Requires Regular Fallout Reports.

A new California law now requires monthly reports to the public on fallout. The new law assigns specific responsibility to the Department of Public Health for monitoring radioactive materials in the environment, and it requires the results of such monitoring to be made public at least once each month. While the Department has not routinely reported fallout activity, for several years it has made public any unusual incidences of radioactivity in water, rain, milk, and other foods. It will now record the monthly averages of airborne radioactivity, regional radioactivity in precipitation, strontium-90 and iodine-131 in fresh milk from 10 milksheds, and in other foods as tests occur. Current levels of airborne radioactivity measure about 5 times higher than those recorded just before the resumption of atmospheric nuclear weapons tests in 1961. However, the September 1963 levels are 5 to 10 times lower than those of later 1961 and most of 1962. If no further atmospheric tests occur, levels of airborne activity will probably decrease slowly to less than one picocurie per cubic meter. --Am. Soc. Civil Eng., Eng. Div. News 90, 1964-6-16 (Feb. 1964)

319 Pesticide Developments.

The Agriculture Department has issued new labeling regulations which among other things, will require that pesticides bear warning and caution statements in large easy-to-read type on the front panel of the label. In another action, Agriculture withdrew endrin registration for use on tobacco. It notified manufacturers and state regulatory agencies that the pesticide is no longer acceptable for registration for this use. When endrin was registered in 1954, data indicated that the registered use pattern would leave a maximum residue of 2.5 ppm of endrin on tobacco. However, according to Agriculture, recent studies show that a much higher residue—according to some reports, as high as 7.8 ppm—now occurs on tobacco. While there are no data to show that the higher residues are dangerous, Agriculture says, neither are there data to show that this level is hazard-free. --Chem. Eng. News 42, 21 (Feb. 24, 1964)

320 Age Discriminatory Hiring Practices to End.

President Johnson recently ordered an end to age discriminatory hiring practices by companies that do business with the Government. The order bars Federal contractors and subcontractors from setting maximum age limits for jobs "except upon the basis of a bona fide occupational qualification, retirement plan, or statutory requirement." The order applies to the hiring of men and women for all work done by government contractors and not just for the work the contractor is doing for the Government. The order will help end job discrimination against people over 45. --Chem. Eng. News 42, 21 (Feb. 24, 1964)

BOOKS, PAMPHLETS AND NOTICES

- 321 Masers and Lasers: How They Work, What They Do. M. Brotherton. 201 pp. plus index. (March, 1964). AVAILABLE FROM: McGraw-Hill Book Company, 330 West 42nd Street, New York, N. Y. 10036 PRICE: \$8.50.

The basic principles and ideas involved in masers and lasers, the development of the master principle, and the method of producing laser action by harnessing the orbital electron system of atoms and molecules are discussed. The author provides a simple explanation of quanta, energy transitions, and other concepts of atomic theory which are essential to the development of electronics at optical frequencies. The sixteen chapters of the book include discussions on: Electromagnetic waves, laser radiation, spectroscopy, atomic theory, nature of the atom, concept of the photon, concept of stimulated emission, traveling-wave ruby masers, ruby and helium-neon lasers, the semiconductor junction laser, uses of masers and lasers, communicating with lasers, significance of frequency band-width, and a capsule history of masers and lasers.

- 322 Guide for Conservation of Hearing in Noise. Revised 1964. A Supplement to the Transactions of the American Academy of Ophthalmology and Otolaryngology. Prepared by Subcommittee on Noise of the Committee on Conservation of Hearing and Research Center Subcommittee on Noise. A. Glorig, Director. 40 pp. (1964) AVAILABLE FROM: Research Center of the Subcommittee on Noise, 327 South Alvarado Street, Los Angeles, California, 90057. PRICE: Not given.

The purpose of this Guide is to assist members of the industrial community in their efforts to protect hearing. The information presented here describes how to determine whether a noise-exposure calls for hearing conservation; and if it does, how to organize, conduct, and monitor a practical hearing conservation program. The initiation of a hearing conservation program should be considered whenever persons have:

1. Difficulty communicating by speech while they are in the noise, or
2. Head noises or ringing in their ears after working in the noise for several hours, or
3. A temporary loss of hearing that has the effect of muffling speech and certain other sounds after several hours of exposure to the noise.

Absence of pain when exposed to noise should not be construed to mean absence of hearing loss. Pain may be felt in the ear during exposure to noise levels of the order of 130 decibels; noise-induced hearing loss, however, may be produced at considerably lower noise levels. Pain and annoyance are not reliable indicators of a potential noise-induced hearing loss. The decision to initiate a hearing conservation program should not be influenced by the presence or absence of these symptoms. Ultimately, the analysis of noise-exposure is the only completely satisfactory way of establishing the need for hearing conservation. **A HEARING CONSERVATION PROGRAM CONSISTS OF THREE PARTS** 1. Analysis of Noise-Exposure — Noise-exposures are analyzed in terms of:

- (a) overall level
- (b) composition of the noise
- (c) duration and distribution of exposure during a typical work-day
- (d) total exposure time during a work-life.

Measurement of each of these four factors of noise-exposure is important for hearing conservation. Even though two different noises have the same overall level, their compositions may differ considerably (to such an extent, in fact, that one may produce a permanent hearing loss while the other may not). Also, the auditory effects of continuous noise-exposure are different from the effects of intermittent exposure to the same noise.

II. Control of Noise-Exposure — Noise -exposure may be reduced by:

- (a) Environmental control
 - (1) reducing the amount of noise produced by the source
 - (2) reducing the amount of noise transmitted through air or building structures
 - (3) revising operational procedures
- (b) Personal protection

The most satisfactory method of environmental control of noise-exposure is to control the noise at the source. Unfortunately, this is not always possible. When the amount of noise produced by the source cannot be sufficiently reduced, a combination of control methods may be required to conserve hearing.

III. Measurement of Hearing — A hearing conservation program should include:

- (a) pre-employment and/or pre-placement hearing tests, and
- (b) routine periodic follow-up tests

These tests of hearing are the most important part of a hearing conservation program. They provide a record of the initial status of an employee's hearing and make it possible to follow any subsequent changes in hearing ability. Pre-employment and follow-up tests help to identify persons who may be highly susceptible to noise-induced hearing loss. Test and retest results will show whether the conservation program is effective or not. Even when noise-exposures are not severe enough to warrant a hearing conservation program, it is desirable to test hearing systematically as part of routine physical examinations. Hearing tests are as important and as necessary as tests of vision, or any of the tests which accompany a physical examination. The statements made in the guide are based on both clinical and industrial experience, and on knowledge gained from research. Included are a summary of basic information about hearing loss and noise-exposure, a broad outline of a hearing conservation program, and a discussion of procedures recommended for executing the program. If you would like more specific information about conservation of hearing in noise, please communicate with the Research Center of the Subcommittee on Noise at 327 South Alvarado Street, Los Angeles, California, 90057. Regarding the discussion of a change in the Standard Reference Threshold in Industrial Hygiene Foundation Engineering Series, Bulletin No. 5, recommended procedures are outlined in this guide for relating 1951 American Standards Association and 1963 International Standards Organization Standards.

INDUSTRIAL MEDICAL PRACTICE

- 323 Asepsis in the Operating Theater. W.H. Cockcroft and F.R.C. Johnstone.
Can. Med. Assn. J. 90, 659-662 (March 14, 1964).

In the investigation of several blood stream infections following open-heart surgery, sutures and other material that had been exposed and handled in the sterile field were examined bacteriologically. One hundred and seventy-five open-heart operations were carried out during the study period and a high percentage of the specimens cultured yielded viable staphylococci and diphtheroids. Glove powder, textile fibers, and skin squames were found in the dust collected in the room during the operations and staphylococci were frequently recovered from this source, and from the floor. Although the air supply to the theater appeared to be of good quality, it is suggested that air currents within the room had caused dissemination of this foreign material and had probably contributed to wound infections.

-- Authors_abst.

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- 324 Shipyard-Employment of the Physically Handicapped. A. Ross and M. Cohen.
J. Occ. Med. 5, 528-530 (Nov. 1963).

Description of the program of placement of the physically handicapped in the San Francisco Naval Shipyard demonstrates that impaired workers can live and work effectively. Of 7,246 employees at work in the shipyard on January 1, 1963, 4,387 were in production jobs. Of these, 290 had significant physical impairments. Forty-two per cent of these had cardiovascular disorders; 36% had monocular vision, and the remaining 22% had a variety of other physical impairments. All were effectively performing their jobs to the complete satisfaction of their supervisors in work that would not aggravate their physical condition.

--Authors' summary

- 325 Disability, Old Age and Employment. H. Rusalem.
J. Occ. Med. 5, 575-578 (Dec. 1963).

The Federation Employment and Guidance Service (FEGS) vocational rehabilitation program has demonstrated that work-motivated older disabled persons can be helped in many cases to re-enter suitable employment. This fact has been demonstrated so clearly that more than a dozen rehabilitation agencies throughout the United States have already used the FEGS program as a prototype and have initiated similar services in their own communities. Given suitable vocational rehabilitation assistance and an intensive vocational placement program, work-motivated older disabled persons can obtain employment in gratifying numbers. When placed on suitable jobs, they tend to make satisfactory employees and contribute to the goals of the offices and plants in which they work. It is now well-established that older disabled persons constitute a valuable human resource which will become more important as the proportion of older persons in our population increases during the 1960's. Through informing themselves about the potentialities of older disabled workers and the services available to them, physicians can play a vital role in the vocational rehabilitation process. This role is not limited to serving as a referral source. By selecting the older persons they refer, by providing vocational rehabilitation agencies with good medical information and by continuing medical supervision of their patients, physicians can fill an active and essential role in the total process.

-- Author's discussion

- 326 Prevalence of Disabilities Among Government Employees. A 7-Year Analysis. A. Tish.
J. Occ. Med. 6, 9-12 (Jan. 1964).

The study reported here constitutes an analysis of disabilities among 100,865 civilian government employees added to the disability retirement roll in the last 7 fiscal years from July 1, 1955, to June 30, 1962, by the Bureau of Retirement and Insurance of the United States Civil Service Commission. This third analysis of the series of disability experiences constitutes the largest group of retired disabled Government employees analyzed to date. The most striking change noted is the sharp reduction in the number of cases of syphilis of the central nervous system as a basis for disability retirement — from 7.9% of all nervous system disorders in 1948 to 3.2% in 1957 and .4% in 1962. The next most striking change is to be found in the marked reduction of persons seeking disability retirement because of tuberculosis. In the 1948 study pulmonary tuberculosis patients made up 63% of those retired for respiratory system diseases, whereas in the 1957 study, pulmonary tuberculosis cases made up 53% of those with respiratory diseases and in the 1962 study, pulmonary tuberculosis cases made up only 22% of those retired for respiratory diseases. The third most striking change is found in the increase in the number of cases of cancer of the respiratory system. In the 1948 study, cancers of the respiratory system made up 11% of the total number of cancer cases, whereas, in the 1957 study they made up 20% of the total number of cancer cases, and in the 1962 study, 22% of the total number of cancer cases found. As for the cardiovascular disability experience, very little change has taken place over the past 15 years.

- 327 Alcoholism, Mental Illness and the "Drunk Driver". M. L. Selzer, et al. Am. J. Psychiat. 120, 326 (1963).

In a series of 67 drivers arrested for driving in an intoxicated state, 38(57%) were alcoholics, 10 (15%) were classified as "probably alcoholics", 4 were pre-alcoholic and 15 were not alcoholic, revealing that 78% of the arrested drivers had pathological drinking problems. Forty-five drivers (67%) were suffering from recognizable psychiatric illness exclusive of alcoholism. The vast majority of the group belonged to the lower socioeconomic classes. Most of the drinking had been done in taverns, clubs, and at house parties, while only a minority had been drinking in their own homes. Apparently a great number of traffic violations and mishaps incurred under the influence of alcohol are connected with alcoholics whose mental disorder makes them immune to the usual educational and legal devices intended to curb driving while inebriated. Detection of the alcoholic driver's psychiatric illness and his addiction, and rehabilitative measures will be effective in protecting the community from repeated exposure to mishap caused by the same accident-prone persons. It is suggested that alcoholic drivers convicted for traffic offenses committed under the influence of alcohol should be required to undergo treatment before resuming driving.

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

- 328 Cardiac Resuscitation- The Present Status of Defibrillation and Stimulation Techniques. J. A. Hopps. Can. Med. Assn. J. 90, 122, 128 (Jan. 18, 1964).

Recent advances in electrical treatment and control of the heart are reviewed. The methods which have evolved for AC and DC countershock defibrillation and arrhythmia correction are outlined, and the parameters defined for determination of the efficacy of treatment. The principal types of cardiac stimulation are described and evaluated in terms of their electrical energy requirements. Externally controlled and implanted stimulators are compared and cause of failure stated. Current developments, reported at a recent Conference on Pacemakers, are included, with a summary of discussions by leading investigators in the field. Studies conducted by the National Research Council (Canada) medical electronics laboratory are also discussed.

-- Author's abst.

- 329 The Role of the Physician in Space Medicine. D. H. Stoddard. J. Occ. Med. 5, 516-519 (Nov. 1963).

Every day, man's progressively augmented technical ability enables him to produce environments which exceed the physiological tolerance of the human organism. He can also transport himself to an unacceptable environment such as space. It becomes of paramount importance, therefore, that physicians participate fully in preventive medicine and engineering programs designed to protect the human being rather than restricting their interests and talents to the treatment of injuries or disease sustained in these hostile environments.

-- Author's conclusion

- 330 Eye Problems in Industry. Hedwig S. Kuhn. J. Occ. Med. 5, 532-539 (Nov. 1963).

There are 8 basic elements in a complete eye program for an industrial plant:

- (1) A study of the various eye hazards in the plant and designation of protective equipment appropriate for each hazard (This is best developed from a study of the men at work in the plant by the plant doctor, the safety director, and the consulting ophthalmologist.) A plan for the application of the techniques of modern first aid and emergency eye care in the plant dispensary.
- (2) The use of modern techniques in medical and surgical care of eye injuries by the consulting ophthalmologist.
- (3) Provision of equipment and methods for modern binocular testing techniques within the plant.
- (4) Determination of minimal visual standards for each job and operation in the plant, following the principle of "eyes for the job".
- (5) Organization of an effective, controlled, ethical referral system for visual correction.
- (6) Securing of a basic knowledge of illumination and color factors in the various work areas.
- (7) Provision for active professional participation within the plant. It is not implied that all 8 of these elements of a complete eye program can be, or should be, provided in every plant, although the entire program is in use in a number of companies. A small plant can take

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from the complete program those parts that suit its needs. The eye program must be tailored to fit the specific plant or company by considering the questions: How much; how done; in what order; by whom and for what purpose? Close cooperation and liaison between management and the medical profession are the keys to success.

- 331 Use of Fluorescein in Eye Injuries. I. J. Cohen. J. Occ. Med. 5, 540-541 (Nov. 1963).

Fluorescein is a vegetable dye that has an affinity for irregular surfaces. This makes it specially useful in demonstrating areas of irregularity on the cornea such as the abrasions caused by injury or disease. It will even mark the point of entry of a penetrating wound so that it can be seen by an untrained observer. Its use is simple and safe, and it should become part of the diagnostic routine in all first-aid rooms when eye injuries are suspected. Fluorescein is available in two forms: a solution to be used in drops, and individual strips of filter paper chemically treated and impregnated with sufficient fluorescein for a single examination. Two frequent pitfalls in the use of fluorescein, and the means of avoiding them are as follows: (1) An excess of dye or an excess of tearing will cause everything to appear stained and thus confuse the observer. This is corrected by absorbing the excess tears in the corner of the eye, which will usually also remove the excess dye. (2) Shreds of mucous deposited on the cornea will also take up the dye. They can be differentiated from abrasions of the cornea by the use of gentle pressure on the lower lid; this will make them move and allow their removal from the corneal surface. Used in this way, fluorescein is a safe, convenient and effective adjunct to the examination of the eye. It should be employed routinely whenever injury of the cornea is suspected.

- 332 Pulmonary Alveolar Microlithiasis. An Unusual Case (Associated With Milk-Alkali Syndrome). L.M. Portnoy, B. Amadeo, and G.R. Hennigar. Am. J. Clin. Pathol. 41, 194-201 (Feb. 1964).

Pulmonary alveolar microlithiasis is a rare disease of unknown etiology and pathogenesis. The clinico pathologic features of an unusual case are described, and it is postulated that the pulmonary alveolar microlithiasis is secondary to mineralization of desquamated epithelial cells in a patient with the milk-alkali syndrome. There are 17 references.

--Authors' summary

- 333 The Prevalence of Tuberculosis Among Patients of the Mayo Clinic. E.F. Lindberg, D.T. Carr, and A.G. Karlson. Proc. Staff Meetings Mayo Clinic 38, 148-152 (April 10, 1963).

A review of the records of the Mayo Clinic in Rochester, Minnesota, for the years 1958 through 1960 revealed that 336 patients had been proved to have tuberculosis by the isolation of Mycobacterium tuberculosis, a prevalence of about one case per 1000 patients. Of the 232 patients with pulmonary disease, 147 were men and 85 were women; the disease was most prevalent in the age group 40 to 69 years in both sexes. Extrapulmonary disease was distributed evenly between the sexes; the systems most frequently affected were urinary, skeletal, and lymphatic systems. Of 153 patients that were tested with tuberculin, only 126 or 82.4%, reacted to a dose of 5 tuberculin units (TU). Only two failed to react to 250 TU. The authors emphasize that all physicians, regardless of specialty, should continue to search for tuberculosis among their patients.

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

- 334 Viral Infections and the Common Cold. H.E. Johnson, et al. Diseases of Chest 45, 46 (Jan. 1964).

The common cold is subject to complications such as superimposed infection. The etiologic agents are many. The symptoms of the common cold may be caused by other viruses in the initial phase of more serious respiratory infection. A satisfactory cold vaccine is difficult to make because of the multiplicity of etiologic agents. Interferon offers a real possibility in the protection against viruses. Because of its species specificity it cannot be

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manufactured in sufficient quantity to be of use in the inoculation of whole populations, but it is deemed possible to solve this technical difficulty. It is doubtful that older people are less susceptible to colds than the young. There is definite evidence that tonsilectomy reduces one's susceptibility to respiratory infections although this is not recommended as a routine procedure. Antihistamines only relieve the symptoms of allergy. Antimicrobics are not indicated in colds except to combat bacteria complications. Polyvalent influenza vaccines should be given annually to as many people as can be reached, particularly the old, the debilitated, and those with chronic respiratory infections.

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

- 335 Urticaria and Asthma From Acetylene Welding. I. Kaplan and I. Zeligman.
Arch. Dermatol. 88, 188-189 (Aug. 1963).

These manifestations occurred in an experienced welder within 15 minutes of exposure to acetylene welding, but not after electric-arc welding. They disappeared in 1 to 6 hours. They did not seem to be related to metal fume fever. The factors which might cause these conditions are discussed, in relation to the composition of agents used. Probably inhalation of gases or combustion products were involved. -- Bull. Hyg.

- 336 Clinical Implications of Chronic Hepatitis. E.D. Palmer.
Military Med. 129, 235-238 (March, 1964).

Clinical experiences with 139 cases of chronic hepatitis, as defined, are recounted. Most of the patients considered themselves well, their disease having been discovered by chance detection of hepatomegaly. Twenty-three per cent of the patients had gastroduodenal ulcer. Portal hypertension and esophageal varices were important complications of the disease, and 25 instances of hemorrhage were proved to have varices as the source. The esophagoscopic anatomy and dynamics of the varices are discussed in a little detail. -- Author's summary

- 337 Mononeuropathies in White Collar Workers. H. Stevens.
J. Occ. Med. 5, 520-527 (Nov. 1963).

A mononeuropathy is a condition in which the symptoms and the examination findings reflect isolated involvement of one nerve. It may occur in white-collar workers as well as industrial workers. Mononeuropathies receive scant attention in medical school, and they are not often seen in internship because hospitalization is rarely required. For these reasons, the industrial physician may not recognize the mononeuropathies he encounters. Often the worker claims the condition is related to his work; and sometimes it is. Many physicians recoil when confronted with any problem involving neuro-anatomy; yet, only relatively limited knowledge or experience is needed to identify the common mononeuropathies. Details regarding the origin and course of nerves is readily available in almost any textbook of neurology. The average physician is not aware that even the most sophisticated neurologist leans heavily on his library. In the present paper 9 of the common mononeuropathies have been presented. Some are benign and self-limiting. Others are caused by prolonged local pressure on the nerve and are corrected by removing the pressure and providing supportive treatment during the recovery of nerve function. The cause of some are unknown but may be cured by surgical release of the pressure. A mononeuropathy is often the first sign of underlying systemic disease. Elaborate knowledge of neurology is usually not needed. Mere awareness that these specific syndromes exist will prompt the physician to pursue the diagnostic problem to a successful conclusion. Adequate history, including mode and circumstances of onset, is most helpful. Diabetes, gout, and alcoholism should be suspected. "Stroke" is the common mistaken diagnosis. Prognosis is usually good. There are 45 references.

- 338 Case of Spider Bite With Severe Hemolytic Reaction. S.A. Minton, Jr., and C. Olson. Pediatrics 33, 283 (Feb. 1964).

A boy aged 7 developed marked jaundice and hemoglobinuria about 24 hours after a bite by a spider. There was a precipitous drop in hemoglobin to 7.3 g./100cc. and leucocytosis of 55,400. Improvement followed administration of intravenous alkaline 5% dextrose solution and whole blood transfusion. ACTH and prednisone had no discernible effect. A hemorrhagic and necrotic lesion developed at the bite and was present 19 days later. The spider responsible for the bite was not obtained, but a specimen of Loxosceles reclusa was collected in the patient's home, and it is considered the probable culprit. This is the first report of this spider from Indiana and represents a northeastern extension of the known range.

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

- 339 The Mechanism of Carcinogenic Factors. H. Dannenberg. Deut. Med. Wochschr. 88, 605 (1963). German.

The author maintains that the mutation theory of carcinogenesis far from being disproved by recent research is actually confirmed by newer understanding of the mechanism of action of the carcinogens. He discusses the manner in which various agents such as organic and certain inorganic compounds, physical factors (ultra-violet and ionizing rays) and finally tumor viruses can cause normal cells to become cancer cells. The genetic code of a cell lies in the desoxyribonucleic acid of the nuclear chromosomes and the ribonucleic acid of the cytoplasm. Any change produced by chemical or physical means in one or the other nucleic acid sites will, in effect, be a mutation. The intrusion of virus into a cell alters its nucleic acid composition. X-ray and ultra-violet rays are known to cause alterations of the desoxyribonucleic acid, considered to be reversible after exposure to small amounts but irreversible on higher exposure. Similar effects are known to result from the action of organic and inorganic chemical substances on the genetic material in the cells. This revival of the mutation theory of carcinogenesis in a modern version may help toward the development of a unifying concept of the pathogenesis of neoplasia.

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

- 340 Infection Hazards in Swimming Pools. D.M. McLean. Pediatrics 31, 811 (1963).

Several Toronto swimming and wading pools, and bathing areas along Lakes Ontario, Erie, and Huron were studied using various parameters. These included determinations of concentrations of coliform bacteria, Escherichia coli, Streptococcus fecalis and viruses; levels of ammonia nitrogen, organic nitrogen and chloride; and amount of chlorine present as disinfectant in the pools. Enteric bacteria were virtually absent from pools, having detectable free chlorine; however, high bacterial counts were found in unchlorinated pools and lake waters. Viruses were not found in any location studied. Chemical evidence of pollution was greatest in recirculating swimming pools, less in overflow — refill pools, and least in freshwater lakes with their infinite dilution. In the Hamilton area where bacterial counts and amount of nitrogen were very high, the relative lack of Escherichia coli and Streptococcus fecalis strongly suggests that this gross pollution has arisen from extra-human sources, such as dead birds and fish.

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

- 341 Circulatory Effects of Chronic Pulmonary Emphysema. T.O. Evans, L. Van Der Reis, and A. Selzer. Am. Heart J. 66, 741 (Dec. 1963).

A series of 59 patients with moderately severe and severe pulmonary emphysema was studied while at rest and during a standardized exercise test at the time when they were in a clinically stable state. These patients represented a broad spectrum of disturbances from normal to grossly abnormal in respiratory function. Findings of arterial pressures, pulmonary vascular resistance, cardiac output, and arterial oxygen saturation, were subjected to a statistical analysis for determining relationships between arterial oxygen saturation and pulmonary arterial pressure which shows that pulmonary hypertension is

related to chronic anemia. No relationship was demonstrated between cardiac output or arteriovenous oxygen difference, and arterial oxygen saturation. A previous survey failed to show satisfactory evidence that a hypercirculatory state exists in cor pulmonale due to emphysema. The occasional occurrence of high cardiac output in cor pulmonale can be satisfactorily explained by elevated oxygen consumption due to increased respiratory effort and bronchial infection.

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

- 342 Physical Exercise in Breathless Subjects with Pulmonary Emphysema, Including a Discussion on Cigarette Smoking. A.L. Barach. Diseases of Chest 45, 113-128 (Feb. 1964).

Breathlessness on exertion limits the physical activity of patients with severe pulmonary emphysema to such an extent as to result in physical unfitness and muscle atrophy. Oxygen inhalation during a graded exercise program overcomes this handicap in some cases. In many others, restoration of diaphragmatic function during walking is required even with the use of oxygen. The technique of breathing training required for effective use of oxygen supported exercise is described. Elimination of a disordered breathing pattern in patients with obstructive pulmonary emphysema is shown to result in a more efficient alveolar ventilation, and a consequent increase in the capacity for exertion. Case histories of two patients with pulmonary emphysema are presented: in one, the oxygen supported exercise program resulted in increased exercise capacity associated with the development of physical fitness; in the other, a marked enhancement of exercise capacity took place as a result of mechanisms apparently similar to an athletic training process. A technique of nonirritant cigarette smoking is described. If tobacco smoke does not enter the lungs, the question is propounded: is there justification for an adamant position in respect to rejection of cigarette smoking? The study of methods of smoking without inhaling deserves more consideration than it has received.

-- Author's summary

- 343 Genetic Bases of Susceptibility and Resistance to Toxic Agents. H. Brieger. J. Occ. Med. 5, 511-515 (Nov. 1963).

This report, like that given by Mountain (Arch. Environmental Health 6, 357 (1963)) suggests new lines of research. In addition to the fact of great theoretical interest, certain practical procedures to prevent occupational disease in individuals with genetic defects appear feasible. In pre-employment examinations, special consideration has to be given to the medical and racial history of the family. A simple method for the detection of erythrocytic glucose-6-phosphate dehydrogenase deficiency has been developed by Fairbanks and Beutler (Blood 20, 591 (1962)). Conventional hematologic procedures remain of value for the diagnosis of the hemoglobinopathies, especially if some simple tests (osmotic fragility, reticulocyte count, examination for sickle cells, and determination of urinary and serum bilirubin) are added. Tests for inclusion and Heinz bodies and siderocytes are only slightly more complicated. Paper electrophoresis of hemoglobin and quantitation of alkali-resistant hemoglobin require highly specialized techniques. Mountain has recommended a modified methemoglobin reduction test for the detection of hypersensitive thalassemic individuals. It is by no means intended to include the special procedures in the general program of pre-employment or periodic health examinations; their use, however, is certainly indicated in industries with specific hazards to genetically defective systems. If possible, both parents and siblings should be examined in suspicious cases. In following these recommendations, industrial medicine will not only improve the practice of preventive medicine but also contribute to the knowledge of this fascinating subject.

-- Author's conclusions

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SKIN DISEASES AND BURNS

- 344 Chromate in Welding Fumes with Special Reference to Contact Dermatitis.
S. Fregert and P. Ovrum. *Acta Dermato-Venerol.* 43, 119 (1963).

Welding fumes are known to be toxic, but contact dermatitis due to the presence of chromium is not generally recognized. Hexavalent chromium was demonstrated in a number of arc-welding fumes. Patch tests with the extracted allergen elicit positive reactions in chromium-sensitive persons. The allergen may at times actively sensitize arc welders.
-- J. Occ. Med. Absts.

- 345 Comparison of Intradermal Test and Patch Test Using Nickel Sulfate and Formaldehyde—A Quantitative Approach: P. V. Marcussen. *J. Invest. Dermatol.* 40, 263 (1963).

From comparing a patch test of 5% nickel sulfate with an intradermal test of 1:10,000 nickel sulfate in a group of nickel-sensitive patients and controls and in a consecutive dermatitis series, it was concluded that the intradermal test is more specific and more sensitive in nickel allergy than the patch test. However, no dilution of formaldehyde in an intradermal test could distinguish between allergic and nonallergic persons. No definite case of isolated intradermal sensitivity to nickel showed a positive epidermal reaction upon patch testing again.
-- J. Occ. Med. Absts.

- 346 Contact Eczema Caused by True Teak (*Tectona grandis*). A Follow-Up Study of a Previous Epidemiological Investigation, and a Study into the Sensitizing Effect of Various Teak Extracts.
H. K. Krogh. *Brit. J. Ind. Med.* 21, 65-68 (Jan. 1964).

A followup study of a previous epidemiological investigation in a furniture factory concerning allergic contact eczema caused by true teak (*Tectona grandis*) clearly shows that a good educational campaign associated with specific and general prophylactic measures are able to control occupational dermatoses. At the first investigation 20.5% of the workers had allergic contact eczema or severe itching whereas only 8.3% suffered from the same complaints on reexamination. The different prophylactic measures previously recommended had been taken. Patch tests with various teak extracts were made on 13 workers sensitized to teak; these showed that lapachol (a derivative of naphthoquinone) is one of the sensitizing agents in teak wood. Furthermore, allergic reactions were obtained in 7 of these workers when Jacaranda wood dust containing lapachol was used as the test substance.
-- Author's abstr.

- 347 Toxic Thromboplastic Extracts of Skin. Potential Role in Thermal Injury.
C. L. Fox, Jr. I. A. Holder and Lucinda L. Malin.
J. Am. Med. Assn. 187, 655-658 (Feb. 29, 1964).

Since extensive thermal burns result in considerable mortality despite massive, fluid therapy, the possible roles of factors other than fluid and electrolyte derangements need investigation. Highly toxic substances can be extracted from both normal and burned skin of mice and humans. One of these extracts exhibits thromboplastic activity as well as toxicity immediately after intravenous injection. When this extract is injected subcutaneously into normal mice, hypercoagulability is induced which is similar to that occurring after thermal injury. Toxic factors released from skin by thermal trauma may contribute to the pathogenesis of burn shock. There are 19 references.
-- Authors' summary

CHEMICAL HAZARDS

- 348 Therapeutic Applications of Oxygen at Two Atmospheres Pressure. G. Smith
Diseases of Chest 45, 40 (Jan. 1964).

More oxygen dissolves in the blood and tissue fluids at an increased tension by allowing the patient to breathe oxygen through a mask while being nursed in a compressed air chamber. Since this determines the speed of transfer of this gas to the tissues, this technique should be valuable in the treatment of anoxic states both generalized and localized to a limb or organ. Using two atmospheres absolute of hyperbaric oxygenation, carbon monoxide, barbiturate poisoning, and the respiratory distress syndrome of the new born have been treated. The technique appreciably lengthens the time of "safe" total circulatory arrest at moderate hypothermia. In more localized ischemic conditions, hyperbaric oxygenation has been employed to maintain cortical activity in coronary arterial occlusion, and in traumatic ischemia of limbs.

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

- 349 Contact Reactivity to Carcinogenic Polycyclic Hydrocarbons.
E. J. Old, B. Benacerraf, and E. Carswell. Nature 198, 1215 (1963).

The chemical carcinogens methylcholanthrene, benzpyrene and 9, 10-dimethylbenzanthracene can induce a high degree of contact hypersensitivity in guinea pigs when injected in Freund's adjuvant. The noncarcinogenic hydrocarbons, anthracene and phenanthrene, were inactive in the same system. Mice could not be sensitized to any of the carcinogens. The species differences are emphasized, especially since mice are highly susceptible and guinea pigs are generally resistant to the carcinogenic action of these chemicals. Man behaves as the guinea pig; he is relatively easily sensitized to many allergens but basically resists experimental chemical carcinogenesis. A reassessment of the use of mice and rats for carcinogen screening may be required. Perhaps guinea pigs should be used to determine the carcinogenic potency of dyes, additives, etc., earmarked for wide human use.

-- J. Occ. Med. Absts.

- 350 Atmospheric Fluoride Contamination in the Pottery Industry. S. G. Luxon.
Ann. Occ. Hyg. (London) 6, 127-130 (July, 1963).

This interesting paper describes experiment done during a health survey of the pottery industry. The etching of window glass near muffle type kilns indicated the presence of Fluorine compounds, and preliminary experiments showed that these were not gaseous. Thermal precipitator samples revealed that the air contained particles of median size 0.1 micron, and almost all below 0.4 micron, which appeared to consist of ammonium fluosilicates. The author outlines the way in which the fluosilicates are probably formed: when the borates are present in the glaze, ammonium fluoborates are also produced. Samples taken at various positions in the kiln workroom showed that the concentration of particles increased rapidly with height, the increase being attributed to the fact that Flue gases can escape from the kiln vent and may contain 70 mg./cu.m. of fluosilicates. The author suggests that the concentration of fluosilicates in the workroom atmosphere could be reduced by improving the ventilation of the kiln or, preferably, by replacing the present day materials by materials containing little or no fluorine, and states that this type of replacement is already taking place.

-- Bull. Hyg

- 351 Radiomimetic Toxicity of Ozonized Air. R. Brinkman. Lancet 1, 133, (Jan. 18, 1964).

Though acute and subacute toxic effects of ozone are recognized, little is known about prolonged exposure to low concentrations (0.1 ppm). The increasing use of "fresh air" ozonizers and other sources of ozone brings up the question of their radiomimetic effects. Evidence is given, for rats, rabbits, and for man that this exposure leads to traceable effects, going deeper than damage to airways. Pairs of mice, exposed to 0.1 or 0.2ppm of ozone for 5 hours daily were not visibly effected, but the neonatal mortality of their young was increased about 5 times. This is a warning against radiomimetic damage of "hygienic" ozone application.

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

01 132 2229

- 352 Long-Term Effects of Sulfur Dioxide Exposure in Pulp Mills. I. O. Skälpe.
Brit. J. Ind. Med. 21, 69-73 (Jan. 1964).

This work is concerned with the problem of the chronic toxicity of sulfur dioxide in pulp mills. Fifty-four workers at 4 different pulp mills working in the acid towers and digester plants have been investigated with special regard to symptoms and signs of respiratory disease. Vital capacity has been measured with a "Kifa" apparatus and maximal expiratory flow with a Wright peak flow meter. The concentration of sulfur dioxide in the working atmosphere has been measured during general working conditions on a single day, and the values were found to range between 2 and 36 ppm. The control group consisted of 56 paper industry workers from the same district with similar working conditions but working in an atmosphere free from objectionable gases. No significant difference in age or smoking habits was found between the groups. A significantly higher frequency of cough, expectoration, and dyspnea on exertion was found in the exposed group, the difference being greatest in age groups under 50 years. The average maximal expiratory flow rate was significantly lower ($P = 0.05$) in the exposed group than in those not exposed for men under 50 years. Over this age there was no significant difference between the two groups. Vital capacity values showed no significant difference between the groups.

-- Author's abst.

- 353 Arsine Poisoning in a Slag-Washing Plant. M. D. Kipling and R. Fothergill.
Brit. J. Ind. Med. 21, 74-77 (Jan. 1964).

An investigation was carried out in an aluminum recovery works after the simultaneous occurrence of hemolytic anemia in two workers in the slag disposal plant. The first worker was admitted to the hospital suffering from nausea, backache, and hematuria. Jaundice developed on the next day. His urine contained protein, urobilin, hemoglobin and methemoglobin but no red cells. During the course of his illness the hemoglobin was reduced to 6.8g./100 ml. There was no abnormality of the blood film and red cell fragility was normal. A fellow worker was affected the same time and was treated at home for the same symptoms. Ten years previously another worker had been admitted to the hospital with anemia, jaundice, and hemoglobinuria. At this works scrap aluminum is melted with sodium chloride and fluorspar as a flux. The slag from the furnace is later broken up and dissolved in a rotating drum by a stream of water. The soluble portion is carried into a lagoon, while the 3% aluminum is retained in the drum and discharged weekly. Two men are employed at a time and another six have been employed in the past 10 years. Five parts per million of arsine were found to be present in the atmosphere during slag washing, but higher levels would have occurred on the occasions when slag from the making of an aluminum copper alloy from copper with an arsenic content was similarly treated. The mechanism of arsenic production is discussed and the literature on the role of aluminum reviewed.

-- Authors' abst.

- 354 The Metabolism of Antimony. D. Djuric
Pracovni Lekar, 15, 329-334 (Oct. 1963). Czech.

A study was made of the distribution and excretion of trivalent antimony after inhalation in rats. In this study $\text{Sb}^{124}\text{Cl}_3$ was used. Results of the inhalation exposures show the typical rapid early loss from lung with a somewhat exponential loss of longer biological half life (approximately 100 days) after the 20th day. Serial sacrifice and tissue distribution indicated primary sites of Sb concentration, other than lung, to be whole blood, spleen, heart, and other highly vascularized tissue. On a long range or a continuous exposure basis, the critical organ based strictly upon an Sb concentration would be the circulating blood, and primarily the red blood cells. Excretion and whole-body counting data are included. Although Sb localizes greatly in red blood cells of the rat, this is not evident in the rabbit or dog.

-- Nuclear Sci. Absts.

- 355 Agrosan Poisoning in Man. I. U. Haq. Brit. Med. J. 1, 1579 (1963).

Of recent years outbreaks of chronic food poisoning with organic chemicals have taken a considerable toll of human life in different parts of the world. An outbreak of poisoning

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in West Pakistan due to the consumption of seed wheat dressed with agrosan GN, an organic mercurial compound, is described. Agrosan GN is a mixture of phenyl mercury acetate and ethyl mercury chloride. Of 34 patients admitted to the hospital, 4 died and 5 seriously ill were removed by relatives and may also have died; the illness among the remaining 25 patients was mild in 14, moderately severe in 7 and severe in 4. Typically the earliest symptoms were malaise and lethargy followed in a few days by nausea and vomiting, excessive thirst increasing weakness and burning in the mouth and stomach. The patient was irritable, had difficulty walking, had slurred speech and was confused. In the more severe cases, the condition progressed to an inability to stand, greater disability in speech and swallowing, blindness and extreme confusion and finally to coma, spasticity and death. Necropsy was performed in one case, and the findings were consistent with chronic mercury poisoning, the organs chiefly affected being the gastrointestinal tract and kidneys. All but 3 patients in the series were treated with British anti-lewisite (BAL), and of those who were treated, all except 3 made an appreciable recovery. On this basis it is concluded that BAL is an effective antidote and deserves a trial as such. The suggestion is put forward that coloring seed grain treated with mercurial compounds or giving it an unpleasant smell or taste would help prevent such outbreaks in the future.

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

- 356 On Estimating Threshold Limits For Mercury in Biological Material. M. Berlin
Acta Med. Scand. 173, Suppl. 396, 29pp. (1963).

This monograph is a summary of work which was published in 1962 and 1963—supported by the Karolinska Institute and the Swedish Medical Research Council. A sketch on occupational exposure to mercury and the basis of MAC values precedes a lucid discussion of the experiments on the fate of absorbed mercury and other relevant publications. Diagnostic indices of exposure and retention are then explored. The distribution of mercury and cumulation in critical organs is very clearly illustrated by autoradiograms of sagittal whole-body sections of mice at intervals of 20 minutes to 16 days after an injection of 0.5 mg. mercury per kg. as the chloride, as the phenylacetate or as the methyl-dicyandiamide—labeled with Hg-203. Accumulation in the testis and parts of the brain is demonstrated 16 days after the inorganic salt, and an enlargement shows cerebral details after the alkyl compound. In acute exposure the kidney and liver accumulate much mercury. With chronic moderate exposure the brain and testis are critical organs. Urinary excretion may reflect recent exposure—but not retention. As indices of body retention, biopsies of skin, liver, kidney or colon mucosa may serve—or even tongue scrapings or toe-nail clippings. It would be worth correlating such concentrations of mercury with signs of mercury intoxication.

-- Bull. Hyg.

- 357 Determination of Mercury in Urine by X-Ray Spectroscopy.
E. J. Brooks, O. R. Gates, and M. Norrington, Jr. Am. J. Clin. Pathol. 41, 154 (Feb. 1964).

The mercury content of urine was determined quantitatively by x-ray spectrochemical analysis in a fraction of the time required by classical procedures. Measurements were made on concentrations as low as 3 micrograms of mercury in 100 ml. of urine (one tenth the clinically maximum allowable concentration). The organic matter is destroyed with potassium permanganate in a sulfuric acid solution of the sample. The mercury is precipitated as the sulfide with thioacetamide in the presence of copper as a collector. The precipitate was collected on a millipore filter and directly analyzed in the x-ray spectrometer.

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

- 358 Radiometric Analysis of Triphenyl Tin Acetate in the Metabolism of Plants and Animals.
J. Herok and H. Goette. Intern. J. Appl. Radiation Isotopes 14, 461-479 (Oct. 1963). German.

Triphenyl tin acetate is distinguished by an outstanding fungicidal action and is, therefore, used as an active ingredient of the plant protection agent Brestan. Since little is known about the behavior of tin-organic compounds in the metabolism of plants and animals, the question of absorption, passage, and accumulation was examined by means of a radio-active-labeled ingredient. Descriptions are given of triphenyl tin acetate (Sn-113) preparation.

experiment, arrangement, and the analysis. The results show that the active ingredient is absorbed by the plant neither through the leaves nor the roots. Animals that take in the active ingredient, perhaps during harvesting time as residue on green fodder, very rapidly excrete it almost completely with the dung. Small amounts which are absorbed are partly discharged in the urine, partly distributed over the whole body, broken down, and within a few weeks also excreted. A graphical analysis of the excretion curves shows that the active ingredient leaves the body with a biological half life of 20 hours while its metabolic products have a biological half life of 8 or 70 days, the latter being attributed to inorganically bound tin.

-- Nuclear Sci. Absts.

- 359 Effect of Zirconium Citrate on Early Femur Uptake and Urinary Excretion of Radioisotopes. B. Kawin. Health Phys. 9, 1031-1034 (Nov. 1963).

Effects of single intraperitoneal administration of non-radioactive zirconium citrate on femur uptake and urinary excretion of either simultaneously injected intravenous Ce-144, Pu-239 (VI) or Y-90 were compared in rats during the initial post-injection hour. Zirconium treatment was associated with increased plasma disappearance of Pu-239. Comparisons in control and treated animals indicate that zirconium citrate treatment has no effect to alter rates of femur deposition for the early time interval studied, and that it enhances urinary excretion of Ce-144 and Y-90, with only a very small effect on Pu-239 excretion.

-- Nuclear Sci. Absts.

- 360 The Work of an Occupational Hygiene Service in Environmental Control. R.I. McCallum. Ann. Occ. Hyg. (London) 6, 55-64 (April June, 1963).

Industrial hygiene services which deal with industry as a whole face difficulties arising from widely varied industries, their geographical position, and the different outlooks of individual firms. The work of the North of England Industrial Health Advisory Service is briefly described. Among other problems, it is at present concerned with lead absorption and poisoning in burners in the shipbreaking industry, and skin irritation and pneumoconiosis in antimony process workers. Studies were made in which the data indicated an excessive amount of lead to be present in shipbreaking yards. There are between 20 and 24 such yards scattered around the coast of Britain, employing between 6 and 60 burners each. Burning through steel plate and girders with oxyacetylene torches was introduced in 1918 as a method of reducing the size of metal pieces as naval vessels were scrapped. The method is currently the same except that the fuel may now be propane or coal gas. The high temperature of the flame vaporizes the lead in the paint work. Air samples taken at 2 shipbreaking yards showed the levels of lead to be considerably above the maximum allowable concentration of 0.2 mg/cu.m even in the open yard where conditions were such that one would expect good natural ventilation. Samples taken during the breaking up of a tanker show that there may be little difference between the amount of lead in air when burning is done aboard ship (1.54—1.72 mg./cu.m.) as compared with the open yard (1.15—2.16 mg/cu.m.) and that there was an excessive amount of lead in the air of the yard as a whole and that it often persisted for some time after work had ceased.

-- APCA Absts.

- 361 Environmental Factors in Childhood Lead Poisoning. R.C. Griggs, et al. J. Am. Med. Assn. 187, 703-707 (March 7, 1964).

In a series of 906 children contacted by door-to-door survey, information was obtained on pica and environmental factors related to lead poisoning, and urine samples were analyzed. Urine was abnormal for lead and coproporphyrin in 216 of 801 children living in old housing and in 3 of 105 children of similar socio-economic background living in a new housing project. Thirty-eight children from old housing, but none from new housing, had significant evidence of lead intoxication. A history of pica for paint, dirt or plaster was obtained more frequently in the old housing but was not an adequate screening test for lead intoxication. Flaking paint on the inside of the home was the environmental factor most frequently associated with an abnormal urine.

-- Authors' abst.

- 362 Stippling of the Retina: A New Physical Sign in the Early Diagnosis of Lead Poisoning.
N. Sonkin. *New Engl. J. Med.* 269, 779 (1963).

While lead poisoning does not occur nearly as frequently as in the past, it is still an important problem in the wire and battery industries. The classic physical findings and laboratory data such as a leadline in the mouth, chronic gastritis, encephalopathy and extensive basophilic stippling of erythrocytes occur only in the advanced stages. This article describes an early diagnostic sign, a grayish stippling of lead pigment that is circumferential about the optic disc. This stippling is readily seen with the ophthalmoscope, the lead particles appearing as glistening, discrete gray pigment in the retinal area around the disc. The described type of retinal pigmentation was found in 8 of 25 persons exposed to lead compounds in an industrial wire-manufacturing company. No lead line appeared in any of these patients, and basophilic erythrocyte stippling was rare. The only test of clinical assistance in the diagnosis of lead poisoning in this group, besides the retinal stippling, was the urinary excretion of abnormal quantities of lead. The retinal pigmentation is reversible within a period of months after discontinuation of exposure to lead.

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

- 363 Roentgenographic Changes in the Lungs of Children with Kerosene Poisoning.
H. Rovsing and H. Wulf. *Am. Rev. Resp. Dis.* 89, 250 (Feb. 1964).

The pathogenesis, symptoms, and signs seen in the cases of 92 children with kerosene poisoning are discussed. Chest radiography was performed in half the cases and revealed early and widespread pulmonary changes even where there were no or few clinical signs. Follow-up studies made on 60% of the patients showed that the long-term prognosis is favorable in cases of kerosene poisoning in children. The authors stress the importance of early and, where findings are positive, repeated radiography.

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

- 364 Renal Biopsy Observations Following Recovery From Ethylene Glycol Nephrosis.
P. Flanagan and J. H. Libcke. *Am. J. Clin. Pathol.* 41, 171-175 (Feb. 1964).

This paper deals with an instance of acute ethylene glycol intoxication, treated by means of repeated peritoneal dialysis, and eventually resulting in apparent recovery of the patient. The histologic and histochemical findings are described, as observed by means of percutaneous renal biopsy performed on the sixteenth day. The convoluted tubular oxalosis is postulated as an intermediary between (1) the reported findings in earlier stages of ethylene glycol nephrosis, and (2) the end stage of oxalate injury in idiopathic oxalosis. There are 10 references.

-- Authors' summary

- 365 A Rapid Method for the Determination of Delta Amino-Laevalinic Acid in Urine. S. Mehani.
Brit. J. Ind. Med. 21, 78-80 (Jan. 1964).

A rapid colorimetric method, sensitive to 0.5 microgram, is described for the determination of delta-amino-laevalinic acid in urine. The method consists of a modification of the picrate method of SHUSTER in which interferences by porphobilinogen is avoided by the use of an ion exchange resin. The method is found to give results which compare in accuracy with the longer standard method of MAUZERALL and GRANICK.

-- Author's abstr.

- 366 Poisoning in Industrial Workers by the Insecticide Aldrin.
G. Kazantzis, A. I. G. McLaughlin, and Pamela F. Prior.
Brit. J. Ind. Med. 21, 46-51 (Jan. 1964).

A 33-year-old worker in a formulating plant developed epileptiform convulsions after a short period of heavy exposure to the chlorinated hydrocarbon insecticide aldrin. He was found to have a high concentration in body fat of hexachloro-epoxy-octahydro-dimethanonaphthalene (HEOD), the principle metabolite of aldrin, and transient

electroencephalographic abnormalities. Nine exposed workers from the same factory were examined, and two of these had symptoms suggestive of aldrin poisoning. At a later date one of these two men and one other man developed convulsions associated with abnormalities of the electroencephalogram and high concentrations of HEOD in body fat. The concentrations of HEOD in body fat and also in blood and the electroencephalogram were found to be useful in diagnosis, and their value is discussed. -- Authors' abst.

- 367 Metabolism of Antimony Oxide Labeled with Sb-124. I. Klucik, et al
Pracovní Lékar. 15, 323-329 (Oct. 1963). Czech.

Metabolism of antimony oxide was studied in 26 rats after intratracheal application and in 18 rats after peroral administration. After a single intratracheal application of Sb_2O_3 in a suspension of water solution of sodium carboxymethylcellulose the Sb was resorbed and stored in the organs in a quantity one order higher than after single peroral administration. The highest percentage of activity was found in the liver and the blood. In the course of observation a significant fall of activity was registered in the liver but not in the blood. The elimination of Sb in the urine and stool may be expressed in square root functions. N,N-diethylthiocarbamate sodium did not accelerate the elimination of Sb_2O_3 which was administered as a solution. -- Nuclear Sci. Absts.

- 368 Toxicological Properties of the Organophosphorus Insecticide Dimethoate.
D.M. Sanderson and E.F. Edson. Brit. J. Ind. Med. 21, 52-64 (Jan. 1964).

The results are presented of extensive toxicological studies on the systemic organophosphate insecticide dimethoate (0:0-dimethyl S-(N-methylcarbamoylmethyl) phosphorodithioate), and compared with published results from other laboratories. It behaves as a typical indirect anticholinesterase, by conversion in the liver to at least four short-lived active metabolites, whose hydrolysis products are rapidly excreted, mainly in the urine. The acute oral toxicity of dimethoate is low in mammals but higher in avians. Dermal absorption is notably slow and dermal toxicity correspondingly low. Cumulative dosing of rats and guinea pigs gave no cholinesterase inhibition at 0.7 and 4 mg./kg./day respectively. Dietary feeding to growing rats caused no cholinesterase inhibition at 0.5 mg./kg./day and no other effect at 10 times this dose. The main plant metabolite is identical with one formed in the liver, and comparative feeding tests with normal dimethoate and that partly metabolized in vegetation showed that residue analysis determined total hazard. Tests on humans, some with P-32-labeled material, confirmed that metabolism and urinary excretion are very rapid, that skin absorption is very slow, and that at least 2.5 mg., and probably up to 18 mg. could be ingested daily for at least 3 weeks without cholinesterase inhibition or other effects. Vapor hazards proved negligible. Oral toxicity was not potentiated by any of 17 other insecticides. The earliest detectable effect of dimethoate poisoning was always erythrocyte cholinesterase inhibition. Symptoms of poisoning could be effectively treated by atropine but not by oxime therapy. No known cases of occupational poisoning have occurred during 5 years' commercial usage of dimethoate. -- Authors' abst.

INDUSTRIAL DUSTS

- 369 Simplified Rational Analysis of Filter Behavior. K.J. Ives.
Proc. Inst. Civil Engrs. (London) 25, 345-364 (July, 1963).

Solutions of simplified equations were produced which enable the head loss, the quantity of deposit, and filtrate concentration for a filter to be calculated without the aid of an automatic computer. The range of calculations, the various types of suspensions (fluc,

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- 362 Stippling of the Retina: A New Physical Sign in the Early Diagnosis of Lead Poisoning.
N. Sonkin. *New Engl. J. Med.* 269, 779 (1963).

While lead poisoning does not occur nearly as frequently as in the past, it is still an important problem in the wire and battery industries. The classic physical findings and laboratory data such as a leadline in the mouth, chronic gastritis, encephalopathy and extensive basophilic stippling of erythrocytes occur only in the advanced stages. This article describes an early diagnostic sign, a grayish stippling of lead pigment that is circumferential about the optic disc. This stippling is readily seen with the ophthalmoscope, the lead particles appearing as glistening, discrete gray pigment in the retinal area around the disc. The described type of retinal pigmentation was found in 8 of 25 persons exposed to lead compounds in an industrial wire-manufacturing company. No lead line appeared in any of these patients, and basophilic erythrocyte stippling was rare. The only test of clinical assistance in the diagnosis of lead poisoning in this group, besides the retinal stippling, was the urinary excretion of abnormal quantities of lead. The retinal pigmentation is reversible within a period of months after discontinuation of exposure to lead.

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

- 363 Roentgenographic Changes in the Lungs of Children with Kerosene Poisoning.
H. Rovsing and H. Wulff. *Am. Rev. Resp. Dis.* 89, 250 (Feb. 1964).

The pathogenesis, symptoms, and signs seen in the cases of 92 children with kerosene poisoning are discussed. Chest radiography was performed in half the cases and revealed early and widespread pulmonary changes even where there were no or few clinical signs. Follow-up studies made on 60% of the patients showed that the long-term prognosis is favorable in cases of kerosene poisoning in children. The authors stress the importance of early and, where findings are positive, repeated radiography.

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

- 364 Renal Biopsy Observations Following Recovery From Ethylene Glycol Nephrosis.
P. Flanagan and J. H. Libcke. *Am. J. Clin. Pathol.* 41, 171-175 (Feb. 1964).

This paper deals with an instance of acute ethylene glycol intoxication, treated by means of repeated peritoneal dialysis, and eventually resulting in apparent recovery of the patient. The histologic and histochemical findings are described, as observed by means of percutaneous renal biopsy performed on the sixteenth day. The convoluted tubular oxalosis is postulated as an intermediary between (1) the reported findings in earlier stages of ethylene glycol nephrosis, and (2) the end stage of oxalate injury in idiopathic oxalosis. There are 10 references.

-- Authors' summary

- 365 A Rapid Method for the Determination of Delta Amino-Laevalinic Acid in Urine. S. Mehani.
Brit. J. Ind. Med. 21, 78-80 (Jan. 1964).

A rapid colorimetric method, sensitive to 0.5 microgram, is described for the determination of delta amino-laevalinic acid in urine. The method consists of a modification of the picrate method of SHUSTER in which interferences by porphobilinogen is avoided by the use of an ion exchange resin. The method is found to give results which compare in accuracy with the longer standard method of MAUZERALL and GRANICK.

-- Author's abstract

- 366 Poisoning in Industrial Workers by the Insecticide Aldrin.
G. Kazantzis, A. I. G. McLaughlin, and Pamela F. Prior.
Brit. J. Ind. Med. 21, 46-51 (Jan. 1964).

A 13-year-old worker in a formulating plant developed epileptiform convulsions after a short period of heavy exposure to the chlorinated hydrocarbon insecticide aldrin. He was found to have a high concentration in body fat of hexachloro-epoxy-octahydro-dimethanonaphthalene (HEOD), the principle metabolite of aldrin, and transient

Electroencephalographic abnormalities. Nine exposed workers from the same factory were examined, and two of these had symptoms suggestive of aldrin poisoning. At a later date one of these two men and one other man developed convulsions associated with abnormalities of the electroencephalogram and high concentrations of HEOD in body fat. The concentrations of HEOD in body fat and also in blood and the electroencephalogram were found to be useful in diagnosis, and their value is discussed.

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Metabolism of antimony oxide was studied in 26 rats after intratracheal application and in 18 rats after peroral administration. After a single intratracheal application of $\text{Sb}_2^{124}\text{O}_3$ in a suspension of water solution of sodium carboxymethylcellulose the Sb was resorbed and stored in the organs in a quantity one order higher than after single peroral administration. The highest percentage of activity was found in the liver and the blood. In the course of observation a significant fall of activity was registered in the liver but not in the blood. The elimination of Sb in the urine and stool may be expressed in square root functions. N,N-diethyldithiocarbamate sodium did not accelerate the elimination of Sb_2O_3 which was administered as a solution.

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- 368 Toxicological Properties of the Organophosphorus Insecticide Dimethoate.
D.M. Sanderson and E.F. Edson. *Brit. J. Ind. Med.* 21, 52-64 (Jan. 1964).

The results are presented of extensive toxicological studies on the systemic organophosphate insecticide dimethoate (O,O-dimethyl S-(N-methylcarbamoylmethyl) phosphorodithioate), and compared with published results from other laboratories. It behaves as a typical indirect anticholinesterase, by conversion in the liver to at least four short-lived active metabolites, whose hydrolysis products are rapidly excreted, mainly in the urine. The acute oral toxicity of dimethoate is low in mammals but higher in avians. Dermal absorption is notably slow and dermal toxicity correspondingly low. Cumulative dosing of rats and guinea pigs gave no cholinesterase inhibition at 0.7 and 4 mg./kg./day respectively. Dietary feeding to growing rats caused no cholinesterase inhibition at 0.5 mg./kg./day and no other effect at 10 times this dose. The main plant metabolite is identical with one formed in the liver, and comparative feeding tests with normal dimethoate and that partly metabolized in vegetation showed that residue analysis determined total hazard. Tests on humans, some with P-32-labeled material, confirmed that metabolism and urinary excretion are very rapid, that skin absorption is very slow, and that at least 2.5 mg., and probably up to 18 mg. could be ingested daily for at least 3 weeks without cholinesterase inhibition or other effects. Vapor hazards proved negligible. Oral toxicity was not potentiated by any of 17 other insecticides. The earliest detectable effect of dimethoate poisoning was always erythrocyte cholinesterase inhibition. Symptoms of poisoning could be effectively treated by atropine but not by oxime therapy. No known cases of occupational poisoning have occurred during 5 years' commercial usage of dimethoate.

-- Authors' abst.

INDUSTRIAL DUSTS

- 369 Simplified Rational Analysis of Filter Behavior. K.J. Ives.
Proc. Inst. Civil Engrs. (London) 25, 345-364 (July, 1963).

Solutions of simplified equations were produced which enable the head loss, the quantity of deposit, and filtrate concentration for a filter to be calculated without the aid of an automatic computer. The range of calculations, the various types of suspensions (floc,

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algae, quartz powder) and filter media (calcium carbonate, sand, anthracite) show the generality of application. Values calculated from the solutions were compared with experimental data. There is agreement between the theoretical and experimental values, indicating that the approach is valid for the analysis and design of rapid filters.

-- APCA Absts.

- 370 Byssinosis in the Egyptian Cotton Industry: Changes in Ventilatory Capacity During the Day. M. A. EL Batawi, R. S. F. Schilling, F. Valic, and Joan Wallford. *Brit. J. Ind. Med.* 21, 13-19 (Jan. 1964).

A study in Egypt of 99 male cotton workers in a cotton ginnery and spinning mill, and of a control group of 12 power station workers, showed that the groups exposed to cotton dust had significantly greater falls in indirect maximum breathing capacity (IMBC) during the shift than groups not exposed to dust. Long-term effects of exposure to cotton dust were studied by examining the IMBC's measured at the beginning of the shift after adjustment to allow for differences in age and sitting height. The adjusted mean value for those with byssinosis was 10.1 liters/min. lower than for normal cotton workers and 19.6 liters/min. lower than for the power station workers. Four men were judged by their breathlessness on slight exertion and low ventilatory capacities to be seriously disabled by byssinosis. In four other mills, all spinning similar types of cotton, changes in IMBC during the shift correlated highly with dust concentrations and indicated a safe level of dustiness of 1 mg./cu. m. (total dust) at which the effects on ventilatory capacity were minimal. -- Authors' abst.

- 371 The Mortality of Miners and Ex-Miners in the Rhondda Fach. A. L. Cochrane, et al. *Brit. J. Ind. Med.* 21, 38-45 (Jan. 1964).

A 6-year follow-up of 6,474 miners and ex-miners, originally radiographed in 1950-1951, has been completed. They represent 97% of all those who were then resident in the Rhondda Fach. In addition, 2,750 non-miners living in the same area were also studied. Death certificates were obtained for all of those who had died, including those who had left the area. Standardized mortality ratios (SMR's) have been calculated for the various age and x-ray category groups. The results suggest that: (1) Progressive massive fibrosis (PMF) is a more serious disease than a previous study suggested; (2) the SMR of miners and ex-miners without PMF is also significantly raised; (3) there is no sign of any relation between the x-ray category of simple pneumoconiosis and the SMR; and (4) the SMR of ex-miners is significantly higher than that of miners.

-- Authors' abst.

- 372 Evaluation of Experimental Methods in the Determination of the Fibrogenic Dusts. II. The Subcutaneous Method. J. S. Harington, et al. *Brit. J. Exptl. Pathol.* 44, 117-124 (April, 1963).

The development of nodules in guinea pigs, produced at the site after the subcutaneous injection of silica, was studied over a period of 18 weeks in respect to the dry and wet weights of the nodules, to the silica, collagen, fat, and amino sugar contents, and to the histological assessments over this period of time. The dry and wet weights of the nodules increased significantly, and the silica content of the nodules remained constant during the course of the experiment. The amount of collagen dropped after 10 weeks and then increased, but there was no detectable change in the fat and amino sugar content. The nodule on a dry-weight basis consists of 60-80% of material probably of a cellular nature, which accounts for the increase in weight over time. The experiment did not produce any useful intercorrelations between silica, collagen, fats, and amino sugars. The findings suggest that the experiment was terminated at a stage when true silicotic collagenization had not yet occurred, at which later stage more marked variations among the constituents might have been expected. The subcutaneous method would therefore seem to be too time-consuming for general experimental use in assessing the complete fibrogenic action of silica, and for this reason must give precedence to the intratracheal method, as described in Part I. of this investigation. It is nevertheless considered that the use of this method as a

discrete indicator of the early changes produced by silica should not be entirely ignored.

-- APCA Absts.

- 373 Changes in Activities of Respiratory Enzymes in Lungs of Guinea Pigs Exposed to Silica Dust. II. Comparison of the Effects of Quartz Dust and Lampblack on the Succinate Oxidase System. Maria G. Breyer, T.A. Kilroe-Smith, and H. Prinsloo. Brit. J. Ind. Med. 21, 32-34 (Jan. 1964).

Kilroe-Smith and Breyer (Proc. Pneumoconiosis Conference, Johannesburg, 1959, Edited by A.J. Orenstein, P. 461, Churchill, London; Brit. J. Ind. Med. 20, 243 (1963)) reported that in the early stages of silicosis in guinea pigs exposed to the inhalation of quartz dust, before the formation of collagen, there were increases in the specific activities of the complete succinate oxidase system and succinate dehydrogenase. The effects on these enzymes of quartz dust have now been compared with the effects of the fibrogenically "inert" lampblack. Lampblack causes a slight increase in the specific activities of these enzymes but the effects are small compared to those caused by quartz. Lampblack also causes a much smaller increase in lung weight than quartz, thus the enzyme increases are roughly parallel to the rise in lung weight. It appears that the effects observed on the enzymes are part of the general pattern associated with the early stages of the development of silicosis.

-- Authors' abst.

- 374 Changes in Activities of Respiratory Enzymes in Lungs of Guinea Pigs Exposed to Silica Dust. III. Progressive Effect on the Succinate Oxidase System of Dust Contained in the Lung after Cessation of Dust Inhalation. T.A. Kilroe-Smith, Maria G. Breyer, and H. Prinsloo. Brit. J. Ind. Med. 21, 35-37 (Jan. 1964).

Previous studies have shown the relation between enzymatic activities in the succinate oxidase system including succinate dehydrogenase, and the early changes in the lungs of guinea pigs exposed to the inhalation of quartz dust. The authors have now investigated whether the increase of enzyme activity depends on maintaining the dust inhalation or not. Animals exposed to the inhalation of quartz dust for a short period of 28 days, sufficient to produce only small changes in the specific activities of the enzymes, and then removed from the dusty atmosphere for a further period of 113 days showed increases of the same order as animals which remained in the dusty atmosphere for a period of 133 days and were then taken out of this atmosphere for 8 days. These increases of enzymatic specific activities are paralleled by increases in lung weight. Hence, in this respect also, the increases in activity of the enzymes follow the same pattern as the fibrogenesis.

-- Authors' abst.

- 375 Pulmonary Asbestosis. V.D. Redaksie, S. African Med. J. 37, 629-630 (June 15, 1963).

In factories the asbestosis hazard is still high despite improved hygienic conditions. The incidence is 44.5% in workers with 20 or more years of exposure and 28% in those with 10-15 years. In Canada, where almost three-fourths of the world's production of asbestos is mined, the miners would appear to suffer little asbestosis and show no significantly increased incidence of cancer of the lung. But in South Africa the miners, and even those living in the vicinity of the mines, have developed both asbestosis and pleural mesotheliomas. The author mentions the study in Capetown of Thomson and co-workers in what would appear to be the first investigation into the extent to which urban dwellers are exposed to the inhalation of asbestos fibers. That study would indicate that asbestos fibers are now an urban hazard. They did not find that it was a significant hazard as of now, but were more concerned with what might happen in the future. The current author comments further, noting that the world production of asbestos is increasing at a staggering rate, and is now 8 times it was 35 years ago. Asbestos-containing products are ubiquitous especially in urban areas. The facts that asbestos fibers are virtually indestructible, and that it is now accumulating on the surface of the earth, mainly in cities, at the rate of 2,400,000 long tons/year are reasons why these fibers may become progressively more dangerous to man. Motor vehicles discharge asbestos dust from brake drums, clutches, silencers, and under-body coatings; modern buildings may

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contain asbestos products from the roof to the basement. It would be a hard turn of fate if the avoidance of ordinary pulmonary asbestosis might lead to an increased frequency of mesothelioma of the pleura or peritoneum, presumably because the population is living longer and the carcinogenic action of asbestos has a longer time to act. It might be well to start now to restrict some of the unnecessary and possibly dangerous uses of asbestos.

-- APCA Absts

- 376 Peritoneal Tumours in Asbestosis. J.B. Enticknap and W.J. Smither.
Brit. J. Ind. Med. 21, 20-31 (Jan. 1964).

Eleven cases of diffuse abdominal tumors in association with exposure to asbestos were discovered in the years 1958 to 1963. There were 8 men and 3 women, all of whom had worked in the same factory. In 7 of the men the age at death ranged from 38 to 78 years; one man is still alive at the age of 46. The women died at 44, 61, and 67. The survival time after the first exposure varied from 20 to 46 years. The shortest period of exposure was 10 months and the longest 32 years. All three of the main commercial types of asbestos had been involved in their working operations. Histological confirmation of the nature of the tumor has been obtained at necropsy in 9 of the 10 deceased and at biopsy in 6, including the survivor. A remarkable feature of these cases is the minimal fibrosis found in the lungs. In 3 men and 1 one woman, asbestosis was not diagnosed during life, and no patient was completely disabled by pulmonary fibrosis.

-- Authors' abst.

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 377 Laser—Medical and Industrial Hygiene Controls.
H.E. Tebrock, W.N. Young and W. Machle. *J. Occ. Med.* 5, 564-567 (Dec. 1963).

The principles of controlling environmental laser hazards are as follows: (1) Avoidance of principal beam and its reflection. (2) Proper education of personnel involved. (3) General information given those who might be casually exposed. (4) Use of warning devices to indicate laser in operation. (5) Policing and clearing of area for long-range operation. (6) Use of proper antilaser eye shields on any observer likely to be exposed. (7) Use of count-downs, with persons closing eyes or looking away from pulsed, high-power beam. (8) Reporting of all persistent after-images to medical department. (9) Fundoscopic and slit-lamp examination of all people involved in laser operations. Laser research may well lead to beams of longer and longer wave length as new materials are discovered that satisfy laser requirements. There is also a simultaneous effort to secure increased power output. Since new effects may be noted as the equipment changes, new or additional health and safety requirements must necessarily be formulated to meet the ever changing experiments.

-- Authors' summary

- 378 How to Cope With Electric-Motor Noise. J. Campbell.
Machine Design 35, 139-158 (March, 1963).

Noise of magnetic and mechanical origin in electric motors is discussed; diagrams of airborne noise and vibration levels are presented for various types of electric motors; establishing specifications for maximum permissible noise values, and steps to reduce motor noise are described. This article is based on a two-year investigation performed at the Norwood Development Laboratory of the Allis-Chalmers Manufacturing Company.

-- J. Am. Soc. Safety Eng. Absts.

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- 379 Occupational Deafness in Weavers. M. Rodda, L. J. Smith, and G. D. Wilson.
New Zealand Med. J. 62, 183-186 (April, 1963).

Audiometric tests were carried out on 41 weavers employed in two mills, where the sound pressure levels were 107 and 108db (re. 0.0002 dynes/sq.cm.). The tests took place 15 minutes after removal from exposure. The pattern of hearing loss observed at frequencies below 2000 c./sec. were affected by a difference in the noise levels in the two testing locations. The weavers were found to suffer a mean hearing loss greater than that expected from presbycusis alone, and the dip appeared at 3,000, 4,000 or 6,000 c./sec. The maximum occupational loss appeared in the group with 20 to 25 years' service, and the authors suggest that this is an indication that the more susceptible employees become aware of the onset of loss of hearing caused by their occupation and leave the industry. The finding that the dip in the group with the longest service (35 to 40 years) occurred at 6,000 c./sec., whereas that for most of the other workers occurred at 4,000 c./sec. is taken as confirmation of this hypothesis (loss at 6,000 c./sec. being less noticeable than loss at 4,000 c./sec.) A comparison of mean hearing loss over the range 1,500 to 8,000 c./sec. for 13 males and 13 females, matched for length of service, showed no significant difference.

-- Cond. from Bull. Hyg.

RADIOACTIVITY AND X-RADIATION

- 380 Thorotrast-Induced Carcinoma of the Liver. D. A. Person, S. Thornton, and E. Issac.
Arch. Surg. 88, 503 (March, 1964).

A fatal carcinoma of the liver occurred 24 years after thorium dioxide (Thorotrast) was injected to outline liver abscess. Earlier x-rays showed typical thorotrast deposits which were verified at surgery, necropsy, and by whole body counting. The whole body counter identified the radioactive material as Thorotrast, localized the deposits, and evaluated the total body burden. Early excision of localized deposits is recommended to prevent carcinoma.

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

- 381 Measurement of Radioactive Contamination by Whole Body Spectrometry. J. E. Colard, et al
Health Physics 10, 15-23 (Jan. 1964).

This paper describes a whole body counter which was used to measure contamination levels of persons over the past 3 years. The results from 2,600 measurements and the evolution of the mean cesium-137 body burden activity from 1959 to date are discussed. Owing to the sensitiveness and selectivity a total whole body counter is essential for the control of the personnel in institutions where unsealed sources of radioactive products are handled. Such a device was used to study the iodine metabolism and to check the validity of a proposed model.

-- APCA Absts.

- 382 The Biological Reaction to Ionizing Radiations. Atomic Structure. T. P. Sears.
J. Periodontol. 34, 174-182 (March, 1963).

Basic principles of nuclear physics are surveyed in relation to biological and medical aspects of ionizing radiation. A discussion is presented of the following theories of biological injury: the theory of point heat, the radiochemical theory, colloid chemical theory, physiochemical theory, disruption of tissue molecules by breakage of valence bonds, and theory of chromosomal injury. The irradiation syndromes are discussed, including: radiation sickness, the neurological syndrome, the gastroenteric syndrome, and the bone marrow syndrome. It is concluded that definitive data on biological injury, genetic mutations, maximum permissible exposure, and the chronic effects of radioactive fallout are not

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sufficiently established at this time to justify the apprehensive state now prevalent in America regarding radiation hazards.

-- Nuclear Sci. Absts.

- 383 Leukemia and Background Radiation in Northern New England. A. Segall.
Blood 23, 250 (Feb. 1964).

A study of population exposure to background radiation and mortality from leukemia was conducted in the states of Maine, New Hampshire, and Vermont. The 1,178 minor civil divisions were grouped into 4 categories according to the mean equivalent uranium concentration in underlying bedrock. The maximum inter-category difference in annual dose-rate from external background sources was estimated to be 14.65 (milliroentgen) mr/year on the basis of a personnel monitoring survey. There was no significant variation between geological regions with respect to exposure to natural internal emitters. Mortality records for the tri-state study area for the period 1925-1954 were examined. A total of 1,970 deaths from leukemia were identified and tabulated by the minor civil divisions. No significant association was observed between mortality from leukemia and radio-geological category either for the entire 30-year study period or within successive decades. The implication of these findings with respect to the dose-response relationship for radiation-induced leukemia is discussed.

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

- 384 Health Physics and Control of Radiation Exposure. Anon.
Atomics 16, 28-30 (Nov.-Dec. 1963).

Health physics is concerned with an understanding of the mechanisms of radiation damage, with the development and implementation of methods and proceedings necessary to evaluate radiation hazards, and with providing protection to man and his environment from unwarranted radiation exposure. Duties and responsibilities of the health physicist are described. Since 1928 a variety of national and state agencies concerned with problems of radiation protection have endeavored to establish and enforce standards of radiation exposure. It is pointed out that the task of these agencies is complicated by the fact that numerical application in radiation protection is largely a matter of judgment and cannot be proven conclusively.

-- Nuclear Sci. Absts.

- 385 Effect of Ionizing Radiation on Man and His Environment. Anon.
Atomics 16, 16-22 (Nov.-Dec. 1963).

The importance of ionizing radiation in the life of man is one of degree rather than time, for ionizing radiation has always been a part of man's environment. Sources of background radiation and geographical factors that influence its levels are considered. Results of interaction of radiations with living tissue, types of radiation, and knowledge of radiation effects are reviewed. Units of radiation measurement are defined.

-- Nuclear Sci. Absts

- 386 Health Hazards from Fallout. H. B. Jones.
Federation Proc. 22, 1415-1417 (Nov.-Dec. 1963).

Previously adopted threshold concepts in the setting of standards for radiation exposure were replaced in recent years by the concept of proportionality. While there is evidence that there is some repair of radiation damage, some lasting increase in risk appears to persist for each increment of exposure to environmental radiation. Extrapolation of experimental data from high levels of exposure to very low levels indicates that the accumulated human exposure over a lifetime accounts for no more than 10% of the observed mutation rate, the observed incidence of cancer, or of aging. In considering hazards from radioactivity in the food chain, it should be noted that fallout effects are less than one-tenth the estimated very rare effects of natural radiation.

-- Nuclear Sci. Absts

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ENVIRONMENTAL MEASUREMENTS

- 387 Convenient Sampling of Air Bacteria in Operating Rooms.
P. Warner, A. Glassco, and Joanna Kroeker.
Can. Med. Assn. J. 90, 537-539 (Feb. 22, 1964).

A convenient arrangement for sampling air bacteria in operating rooms with a slit sampler (the Fort Detrick sampler) is described. Its purpose is to contribute as far as possible to the convenience of the surgical staff and thereby to the safety of the patient. It has the advantages of recording minute-to-minute changes in bacterial air count, it is unobtrusive and yet can be continually observed by a technician; it is not noisy and avoids the dangers of explosion and static electricity; it is inexpensive, and parts are easily replaced; and finally it provides a means of keeping permanent photographic records of bacterial counts. Results of a preliminary trial of this method appeared to be satisfactory.

-- Authors' abst.

- 388 Motorist Exposures to Aldehydes from Diesel-Powered Buses.
C.E. Schumann and C.W. Gruber, J. Air Poll. Control Assn. 14, 53-55 (Feb. 1964).

The data obtained from this survey, coupled with personal observations by the authors, indicate the following: Motorist exposures to aldehydes (low molecular weight aldehydes, such as formaldehyde and acrolein) from diesel buses in Cincinnati are well below published maximum average atmospheric concentration of contaminants for industrial workers for 8-hr. day exposures. However, this does not preclude, nor is it the intent of the authors to state, that exposure to such levels of aldehydes or related diesel exhaust products cannot produce adverse health effects, either directly or indirectly. Standards have not been established for general population exposures to community air pollution. Of the 15 buses sampled, none could be classified as excessive "smokers". This could be attributed to several factors; e.g., the use of better quality fuels, an improved inspection and maintenance program, and a recent change in fuel injector tips to improve fuel atomization into the combustion chambers. Aldehyde concentrations two or three car lengths behind buses can, and sometimes do, exceed the odor threshold of the lower aliphatic aldehydes. It has been estimated that the per gallon aldehyde losses from diesel fuel exceed that of gasoline by a factor of three. Based upon a 4-mile per gallon diesel fuel requirement for city bus operations compared to a 12-mile per gallon requirement for conventional automobiles, the diesel bus will emit 9 times more aldehydes per mile traveled than the automobile. In spite of obvious improvements in visible smoke emissions, the diesel-bus odors in Cincinnati still exist in sufficient quantities to prompt public complaints. Whether future improvements or developments in fuel, engine design, maintenance, or control devices will result in an adequate reduction of offensive exhaust constituents to eliminate these public objects remains to be seen.

-- Authors' conclusions

- 389 Odour Thresholds of Some Organic Compounds Associated With Food Flavours.
D.G. Guadagni, R.G. Buttery, and S. Okano.
J. Sci. Food Agr. 14, 761-765 (Oct. 1963).

A simple technique for measurement of olfactory thresholds of odorous materials is described. The method involves the use of an ordinary 16-oz. polyethylene wash bottle connected with polyethylene tubing to deliver the vapor to the olfactory membranes. The bottle was filled about half full with the solution to be tested and submitted to the judge with a similar bottle containing odor-free water. He was instructed to place the tube at his nostril and gently squeeze the bottle as often as he liked, thus forcing vapor into the nasal cavity. During the course of the investigation, a glass nose-piece was constructed and connected to the end of the polyethylene tubing, thus allowing the vapor to enter both nostrils.

in an essentially closed system. When tests, at or near the threshold concentration, indicated that the sensitivity and reproducibility were essentially the same with and without the nose-piece, it was discarded. Since polyethylene bottles often have a characteristic odor which might interfere with threshold determinations, many methods of removing the odor and cleaning the bottles were tried. The most satisfactory method found to date involves washing thoroughly with a non-odorous detergent, rinsing carefully in boiled water, and boiling the washed bottles in water 1-2 hours. Bottles made of teflon have now become available and limited tests indicate that essentially the same results are obtained as with the polyethylene bottles cleaned as above. Olfactory thresholds for a number of pure compounds, several of which were identified in potatoes, indicated that, in general, sulfur compounds and short-chained unsaturated aldehydes gave the lowest and highest thresholds, respectively. The thresholds of a homologous series of saturated aliphatic aldehydes decreased progressively with increase in chain length from C₅ to C₁₀. Similar results were obtained with a series of unsaturated aldehydes. Thresholds of some of the more potent compounds were less than 0.1 of a part /10⁹ parts of water. -- APCA Absts.

- 390 Improved Techniques for Environmental Sample Analysis. A. L. Boni.
Health Physics 9, 1035-1046 (Nov. 1963).

The need for reducing the handling and preparations of samples, and achieving greater sensitivity and more specific data led to the development of improved analytical techniques. When simplified sample preparation techniques are combined with gamma-spectrometry using a large-well crystal detector, sample processing time is reduced, lower detection limits are achieved, and more accurate specific analyses are obtained. Sample collection preparation, field and laboratory equipment, and data processing are discussed in detail. -- APCA Absts.

- 391 Analysis of Toxic Gaseous Combustion Products. A. Fish, N.H. Franklin, and R. T. Pollard.
J. Appl. Chem. (London) 13, 506-509 (Nov. 1963).

A rapid and accurate gas chromatographic method of analysis of toxic gases produced during the burning of solids containing chlorine has been developed. This technique enables chlorine, hydrogen chloride, phosgene, carbon dioxide, and simple hydrocarbons to be estimated from a single sample, a further sample affords determination of carbon monoxide also. The method was applied to the combustion under a variety of conditions of temperature, oxygen availability and reaction time of a fire-retardant building paper containing approximately 20% of chlorine. Large quantities of carbon dioxide and hydrogen chloride were produced, chlorine, carbon monoxide, and phosgene being minor products. The results are compared with maximum permissible concentrations and their application to actual fires is discussed. -- APCA Absts.

- 392 Sulfate Particulates: Size Distribution in Pittsburgh Air. M. Corn and L. DeMaio
Science 143, 803-804 (Feb. 21, 1964).

Sulfate particles with diameters of less than 1.7 microns contribute approximately 40% by weight to total sulfate particulate in Pittsburgh air. The irritant nature of these particles and their small size and associated long atmospheric residence time, as well as the short half-life of sulfur dioxide in the atmosphere, suggest that particulate sulfate may be a better indicator of atmospheric pollution than sulfur dioxide. -- Authors' abst.

- 393 Study of Air Pollution by Analysis of Particulate Material Collected from Air Filtration Plants.
IV. Determination of Germanium in Total Air Solids. A. J. Lindsey and J. R. Stanbury.
Intern. J. Air and Water Poll. 7, 1-3 (Jan. 1963).

The method previously used was modified to suit germanium determinations in the air from air solids collected from air filtration plants. The object of this investigation is to continue the study of total air solids, and the variation of the amounts of germanium is shown as

microgram/g. of air solid ash. The amounts of germanium vary randomly throughout the year and there is no cyclic variation as such as observed for partial combustion products in air solids. The amounts vary between 25 and 73 ppm and the average is 38.4 ppm.

-- APCA Absts.

PREVENTIVE ENGINEERING

- 394 In-Plant Emergency Program. F.H. Herbert. Oil Gas J. 61, 62-64 (July 22, 1963).

In-plant emergency plan has been set up at a South Charleston, W. Va. plant to provide organization and equipment necessary to quickly control any hazardous situation which might arise; the plan was intended to supplement a very effective area program and can be used as a basis for setting up a similar program in almost any petrochemical plant or refinery.

-- J. Am. Soc. Safety Eng. Absts.

- 395 Guidelines to Follow When Designing for Plant Safety. D.V. Gagliardi and N.R. Pratt. Plant Engr. 17, 108-111 (June, 1963).

A hypothetical building plan is taken step-by-step in the discussion of safety facets in the design of a new plant; in the example, safety pertains to a chemical process with most of the suggestions equally applicable to everyday plant operations; the direction of prevailing wind, location of adjacent plants and the hazards of the proposed plant are considered during plant layout.

-- J. Am. Soc. Safety Eng. Absts.

- 396 Design Considerations for Pressure-Relieving Systems. E. Jennett. Chem. Eng. 70, 125-130 (July 8, 1963).

This survey includes codes, regulations, and authorities, components of system, design considerations in respect to system needs, codes, flare valves, and rupture disks. There are 46 references.

-- J. Am. Soc. Safety Eng. Absts.

COMMUNITY AIR HYGIENE

- 397 Natural Phenomena in Air Pollution. J.C. Schwegmann. J. Air Poll. Control Assn. 14, 48-49 (Feb. 1964).

The expression "air pollution," has the connotation of a man-made problem associated with industrial activity, automotive exhausts, and high population density. Whereas the emphasis of the modern concept of air pollution rightfully belongs on these sources, nature has contributed, is contributing, and will continue to contribute to the contamination of man's gaseous environment. It is only necessary to refer to contemporary events to recognize nature's part in air pollution; active volcanoes, dust storms, and fog are just a few of the most spectacular items in nature's bag of tricks. Less spectacular, but yet significant to those affected, is the pollution of air by dust, pollen, and fungus spores which are related to hay fever and asthma. An abundance of facts does not guarantee a quick or easy solution to air pollution complaints. The interpretation of the facts is sometimes beyond the competence of the investigator. It is, therefore, frequently necessary for the investigator to seek the

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advice and assistance of those who are competent in unusual disciplines. Since nature has an apparently inexhaustible bag of tricks from which to draw, we cannot hesitate to consult with biologists or naturalists when studying unusual problems in air pollution.

- 398 Performance Budgeting for the Public Health Service Air Pollution Program. R. Perman. J. Air. Poll. Control Assn. 14, 43-47 (Feb. 1964).

It is difficult to generalize on or characterize the basic interests of those who review budget proposals. Budget officials may have a different perspective than program officials. Legislative groups will have a different perspective than executive officials. However, the validity of the general hypothesis of the Hoover Commission with respect to performance budgeting, in stressing budget reviewer interest in programs or activities, appears to be borne out by the experience of the Division of Air Pollution. A review of the published Congressional Hearings on the Air Pollution Appropriation estimates for the past several years further seems to support this hypothesis. For air pollution control officials at all levels of government, the performance budget approach should be used where ever possible. The details as to format of presentation are less important than the spirit with which the task of budgeting is undertaken. If there is a determination to convey, in the most meaningful and understandable terms, the needs and plans of an air pollution control agency, every possible opportunity should be taken to re-orient an agency's budget along performance lines. Where the requirements for itemization are so fixed that change is not practicable, some officials have succeeded in drawing up supplementary budgetary documents and have had these reviewed along with the required documents. If paraphrasing is permitted, the air pollution control official should not expect to be loved, but he should try to be understood.

-- Author's conclusions

- 399 A Calibration of the Filter Paper Method of Estimation of Smoke. J. Coulson and J.M. Ellison. Brit. J. Appl. Phys. 14, 899-903 (Dec. 1963).

During a period of high pollution in December 1962 smoke samples were taken on Whatman cellulose fiber and glass fiber paper, and the weight collected on the latter was used to derive a calibration curve for the standard filter paper method of estimation of smoke. Results show that the weight of smoke which causes a given degree of soiling is greater in summer than in winter, and the slope of the curve is not always the same even under comparable weather conditions. The purpose of the experiment was to determine how the calibration of the method depended on the weather during sampling. -- APCA Absts.

- 400 Air Pollution and Respiratory Disease. H. Heimann. Ann. Allergy 21, 396-407 (July, 1963).

The author has limited his discussion to the recognizable man-made air pollutants only, and to the effects of pollutants on the health of man, specifically as they affect the respiratory system. Information is presented regarding the following disease states: acute nonspecific upper respiratory disease; chronic bronchitis, chronic constrictive ventilatory disease, and pulmonary emphysema; and bronchial asthma. In the summary the belief is stated that air pollution, as it exists in some of our communities, contributes significantly as a cause or aggravating factor of the above medical conditions. It is recognized that the data on which these conclusions have been reached are not complete. Work in this field was started only a few years ago with a few facts and many surmises and hypotheses. More is known now but more is yet to be known. With continued study of the problem and with further information available, it is anticipated that there will be further reason for the control of air pollution to protect man's health.

-- APCA Abst.

01 132 2243

- 401 Pulmonary Function Impairment Produced by Atmospheric Pollution.
H. L. Motley and H. W. Phelps. Diseases of Chest 45, 154-162 (Feb. 1964).

The Los Angeles smog was found to aggravate the severity of emphysema by increasing the residual and impairing still further air distribution in the lungs. The Tokyo-Yokohama asthma type probably should be referred to as an allergic bronchitis, and this condition probably exists in many parts of the world. The control of the military personnel in Japan by the armed forces is unique and this method of studying the effects of air pollution is not available in most other areas. Airway obstruction was a consistent finding, often associated with increased residual air and hypoxia. The present outlook is less favorable than at first thought regarding complete reversibility when the subjects stay too long in the Tokyo-Yokohama area after the condition has become manifest. The use of treatment rooms with air filtered over activated carbon has been demonstrated to protect patients against air pollution in Los Angeles and in the Tokyo-Yokohama areas. An allergic type of bronchitis was demonstrated in an industry from the introduction of two chemicals in the manufacturing process, and the clinical and physiologic findings in the sensitive patients were similar to the Tokyo-Yokohama asthma type. Cigarette smoking (personal air pollution) irritates the bronchial epithelium and appears to be an important factor in rendering individuals more susceptible to allergic factors in air pollution. Cigarette smoking impairs the transfer of oxygen to the blood from the lungs in severe emphysema. Air pollution has become a serious medical problem in many of the larger cities of the United States, and all possible measures should be taken to reduce the pollution from all sources and to prevent further increases.

-- Authors' summary

- 402 Atmospheric Aldehydes Related to Petunia Leaf Damage.
Eileen G. Brennan, Ida A. Leone, and R. H. Daines. Science 143, 818-820 (Feb. 21, 1964).

Snowstorm petunias grown in the greenhouse developed a necrotic banding of the actively expanding foliage characteristic of injury ascribed to various photochemically produced pollutants in the atmosphere. In this case the damage appeared to be related to the high aldehyde content of the ambient air. Each time the aldehyde concentration exceeded 0.20 parts per million for 2 hours, injury appeared within a day or two. From July to September 1963 such plant injury was observed on seven occasions.

-- Authors' abst.

- 403 Airflow Related to Denver Air Pollution. L. W. Crow.
J. Air Poll. Control. Assn. 14, 56-59, 65 (Feb. 1964).

The airflow related to air pollution episodes in the Denver metropolitan area shows a definite sequence throughout the daily period. Downslope motion and collection of polluted material in the lowest and coldest portion of the area takes place during the night. Differential heating and the artificial blanket of air pollution during the daylight hours combine to permit upslope airflow from north to south. The main objective of the study was to explore methods for a systematic approach leading to definitive computations explaining Denver pollution. Such computations are necessary for formulation of sound remedial measures.

-- Author's conclusion

- 404 Weather Data for Air Pollution— Available, Analysed, and Inexpensive. R. H. Frederick.
J. Air Poll. Control Assn. 14, 60-64 (Feb. 1964).

This paper is not intended to be an exhaustive review of the use of Local Climatological Data (LCD) and climatology publications. It is intended to show that there may be a ready and yet inexpensive source of data which may be applied directly to an air pollution problem or as a guide to indicate what meteorological areas need additional or specialized data. Application to specific problems may be rather subtle and not immediately obvious. Mention should also be made of the large volume of summaries that have been made for many locations other than those having published LCD's. For instance, the Air Force and Navy have made many summaries needed in their operations. These are on file at the National Weather Records Center and can be made available upon receipt of a request to determine if

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there are data existing in a particular locality. Should published or previously prepared summaries not be a solution to the problem, the available meteorological observations may still be usable. The National Weather Records Center has the professional and machine capabilities to perform data tabulations and analyses as required. They are equipped to handle problems of any size or complexity charging only for the cost of production. They can perform operations ranging from the simplest data tabulations to the solution of complex mathematical formulas. -- Cond. from author's conclusion.

- 405 Air Resources Engineering Progress Report Research Council on Air Resources Engineering. Anon. Proc. Am. Soc. Civil Engrs., J. Sanit. Eng. Div. 90, 67-71 (Feb. 1964).

Activities and programs of the Research Council on Air Resources Engineering are examined. Observations demonstrate needs in basic and engineering research to cope with air pollution problems and the introduction of engineering technology into the conservation of the air resource. The Council program includes assessment of research needs, the stimulation of research oriented both to regional and national problems, and the recommendation and support of projects. -- Author's abst.

- 406 Prevention and Control of Air Pollution at Cape Kennedy. P.M. Ricca, J.P. Terry, and J.O. Welke. Air Eng. 6, 35-38 (Feb. 1964).

On the Atlantic Missile Range heavy emphasis is placed on prevention of air-borne emissions at the source by safe equipment and operation. Large volumes of toxic and dangerous propellants are handled and used with a minimum of volatile losses. When toxic clouds are unavoidable in operations and launches, strict consideration is given to transport vectors. Flexible air quality standards are established as required for specific missile systems. If contamination does occur, protection of personnel and rapid decontamination is provided in the affected areas. Airborne emissions are prevented and controlled by good design, operation and surveillance. -- Authors' summary

- 407 The Control of Air Pollution. A.J. Haagen-Smith. Sci. Am. 210, 25-31 (Jan. 1964).

Los Angeles has analyzed the sources of smog and undertaken methods of control. The Los Angeles atmosphere differs from most other heavily polluted communities. During smog attacks the ozone content of the air reaches a level 10-20 times higher than elsewhere. Concentrations of 1/2 part ozone/ million of air have been measured during heavy smogs. For the control of air pollution it is important to know that organic substances, olefins, unsaturated and aromatic hydrocarbons, and the derivatives of these various kinds of molecules can give rise to ozone or other typical manifestations of smog. A preferable method of controlling hydrocarbon emissions from automobile tailpipes would be better combustion in the engine. Nine makes of afterburners, 6 catalytic, and 3 direct flame are now under test by the California Motor Vehicle Pollution Control Board. Much testing and modification will be necessary for completion. Air quality standards adopted by California set 3 levels of pollution: adverse, serious, and emergency. These standards provide a basis for pollution control measures. -- APCA Absts.

MANAGEMENT ASPECTS

- 408 The Science of Management is Not for Management Only. R.D. Collins. J. Am. Soc. Safety Eng. 9, 16-20 (Jan. 1964).

The safety engineer must re-examine the still popular—almost axiomatic—

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safety tenet that "safety must have top management support." It is believed that close introspection will produce the corollary, "management must have the safety engineer's support." This is not a contradiction of the first; nor its antithesis. It is more nearly a rearrangement of the emphasis. The first implies that the company leaders must demand safe machinery, safe operating methods, and the unwavering acceptance of safety engineering techniques. The second, more realistically, proposes that the safety engineer owes his management the kind of staff assistance that will provide an industrial environment conducive to safe operation. The first insists on a management stand; the second on a management philosophy. The first opposes the natural tendencies; the second makes use of them. The first can have only short-lived results; the second shows promise of a more permanent control. And so the responsibility of the safety engineer is to know management, (both art and science), and to acquire some of the management skills. Management is not for management only. It is a discipline that must be added to the others appropriate to the safety specialist. It should be high on the list of prerequisites for professionalism in the safety field.

-- Author's conclusion

ACCIDENTS AND PREVENTION

- 409 The Concept of Accident Proneness: A Review. P. Froggatt and J.A. Smiley.
Brit. J. Ind. Med. 21, 1-12 (Jan. 1964).

The term accident proneness was coined by psychological research workers in 1926. Since then its concept—that certain individuals are always more likely than others to sustain accidents, even though exposed to equal risk—has been questioned but seldom seriously challenged. This article describes much of the work and theory on which this concept is based, details the difficulties encountered in obtaining valid information and the interpretative errors that can arise from the examination of imperfect data, and explains why accident proneness became so readily accepted as an explanation of the facts. A recent hypothesis of accident causation, namely that a person's accident liability may vary from time to time, is outlined, and the respective abilities of this and of accident proneness to accord with data from the more reliable literature are examined. The authors conclude that the hypothesis of individual variation in liability is more realistic and in better agreement with the data than is accident proneness.

--Authors' abst.

MISCELLANEOUS

- 410 Relative Resistance of Fish to Petroleum Refinery Wastes. Part 3. N.H. Douglas and W.H. Irwin.
Ind. Water & Wastes 8, 22-25 (March-April, 1963).

For Parts 1 and 2 see Absts. 1090 and 1091 in IHD for November, 1963. An extensive bibliography on the relative resistance of fish to petroleum refinery wastes is presented, which is helpful to those interested in the subject. Probably no one species of fish possesses the favorable testing characteristics that place it above all others for use as an indicator of toxicity in bio-assay. Most of the minnows and other small fish, such as N. percobromus, H. placitus, N. Zonatus and L. Sicculus, are always of a desirable testing size, but they are often difficult to collect in sufficient numbers, and their delicate tissue makes injury and scale loss a problem. There are 30 references.

-- Public Health Eng. Absts.

01 132 2246

- 411 Atmospheric Emissions from Oxidation Ponds. R. Y. Nelson and J. O. Ledbetter.
J. Air Poll. Control Assn. 14, 50-52 (Feb. 1964).

Oxidation ponds have been used for many years and more are being constructed each year as these treatment facilities are recognized as feasible methods for stabilizing domestic and industrial wastes. The work of an oxidation pond—the degradation of organic materials—is brought about through the action and interaction of microorganisms such as algae, bacteria, and actinomycetes. These organisms consume complex organic matter and produce intermediate substances as a part of their metabolic process. Preliminary analysis indicates methane production in the range of 5 cubic feet per lb. biological oxygen demand (BOD) destroyed under the loading conditions of 55 lbs. BOD per acre per day. At night under these conditions carbon dioxide is emitted at the rate of about one cubic foot per lb. BOD destroyed. Studies with tagged sulfur in a well-operated pond show that no significant amounts of sulfur compounds are released. An interesting phenomenon occurred in one pond when odor abruptly developed. No changes in operating procedures were noted, however, the algal population died off. There was a high jump in BOD and decrease in pH at the time of this odor. With the return of algal bloom, odor decreased and BOD and pH have readjusted to some extent.

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American Medical Association
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Chicago, Illinois 60610

J. Am. Soc. Safety Eng.

Journal of the American Society of
Safety Engineers
American Society of Safety Engineers
5 North Wabash Ave.
Chicago, Ill. 60602

J. Appl. Chem. (London)

Journal of Applied Chemistry (London)
Society of Chemical Industry
14 Belgrave Square
London SW 1, England

J. Invest. Dermatol.

Journal of Investigative Dermatology
Williams & Wilkins
428 East Preston Street
Baltimore, Maryland 21202

J. Occ. Med.

Journal of Occupational Medicine
Hoeber Medical Division of Harper & Row
Publishers
2 Park Ave.
New York, N.Y. 10016

J. Periodontol.

Journal of Periodontology
American Academy of Periodontology
1121 W. Michigan
Indianapolis, Ind. 46202

J. Sci. Food Agr.

Journal of the Science of Food and Agriculture
Society of Chemical Industry
14 Belgrave Square
London SW 1, England

Lancet

The Lancet
7 Adam Street
Adelphi
London WC 2, England

Machine Design

Penton Publishing Co.
Penton Bldg.
Cleveland, Ohio 44113

Military Med.

Military Medicine
Association of Military Surgeons of the
United States
1500 Massachusetts Avenue, N.W.
Washington, D.C. 20005

Nature

MacMillan and Company, Ltd.
St. Martin's St.
London, England

New Engl. J. Med.

The New England Journal of Medicine
Massachusetts Medical Society
8 Fenway
Boston, Mass. 02215

N. Zealand Med. J.

New Zealand Medical Journal
British Medical Association
New Zealand Branch
Box 156
Wellington, N. Z.

Oil Gas J.

Oil and Gas Journal
The Petroleum Publishing Co.
211 S. Cheyenne Ave.
Tulsa, Oklahoma 74103

Pediatrics

Charles C. Thomas
301-327 E. Lawrence Ave.
Springfield, Illinois

Plant Engineering

300 E. James St.
Barrington, Ill.

Pracovní Lekar

Pracovní Lékařství
Postovní Novinový Úrad,
Jindřišská 14
Prague 3, Czech.

Proc. Am. Soc. Civil Engineers

Proceedings of the American Society of Civil
Engineers
Journal of the Sanitary Engineering Division
American Society of Civil Engineers
345 East 47th Street
New York, N.Y. 10017

Proc. Inst. Civil Engrs. (London)

Proceedings of the Institution of Civil Engineers
(London)
Great George St., Westminster
London SW 1, England

Proc. Staff Meetings Mayo Clinic

Proceedings of the Staff Meetings of the Mayo
Clinic
Mayo Association
Rochester, Minnesota

Science

American Association for the Advancement of
Science
1515 Massachusetts Ave., N.W.
Washington, D.C. 20005

Sci. Am.

Scientific American
Scientific American, Inc.
415 Madison Ave.
New York, N.Y. 10017

Scientific Information Notes

National Science Foundation
Washington, D.C. 20550

S. African Med. J.

South African Medical Journal
Medical Association of South Africa
Cape Town, South Africa

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