

Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL

MAY, 1963
(Vol. 27, No. 5)

INDUSTRIAL HYGIENE FOUNDATION
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INDUSTRIAL DISEASES

The evaluation of drugs in industry is discussed in Abstr. No. 413.

See Abstr. No. 415 for details on measuring blood cholinesterase.

Abstr. No. 417 investigates environment and gastrointestinal disease.

Abstr. No. 421 is concerned with the early detection of cancer among low income groups.

Abstr. No. 425 reports on neurodermal disease in industry.

A test for hypersensitivity to hydrolytic chemicals is described in Abstr. No. 432.

Fluoride exposure and worker health is the topic of Abstr. No. 435.

The fatalities of acute salt poisoning in infants is reported on in Abstr. No. 438.

Data on the absorption and excretion of mercury in man are presented in Abstr. No. 442.

See Abstr. No. 444 on the absorption of the radioactive isotope lead-210.

Abstr. No. 446 reports on the effect of the environment on the development of atherosclerosis.

Measuring the effect of a chemical on the development of atherosclerosis is the topic of Abstr. No. 447.

Information on the effect of a chemical on the development of atherosclerosis is given in Abstr. No. 448.

An abstract on the effect of a chemical on the development of atherosclerosis is given in Abstr. No. 449.

Research on the effect of a chemical on the development of atherosclerosis is the topic of Abstr. No. 450.

See Abstr. No. 451 on the effect of a chemical on the development of atherosclerosis.

Some research on the effect of a chemical on the development of atherosclerosis is given in Abstr. No. 452.

FOUNDATION

NEW MEMBERS The Foundation has received the following new members:

General Motors Corp., Detroit, Mich.
Morton Chemical Company, Evansville, Ind.

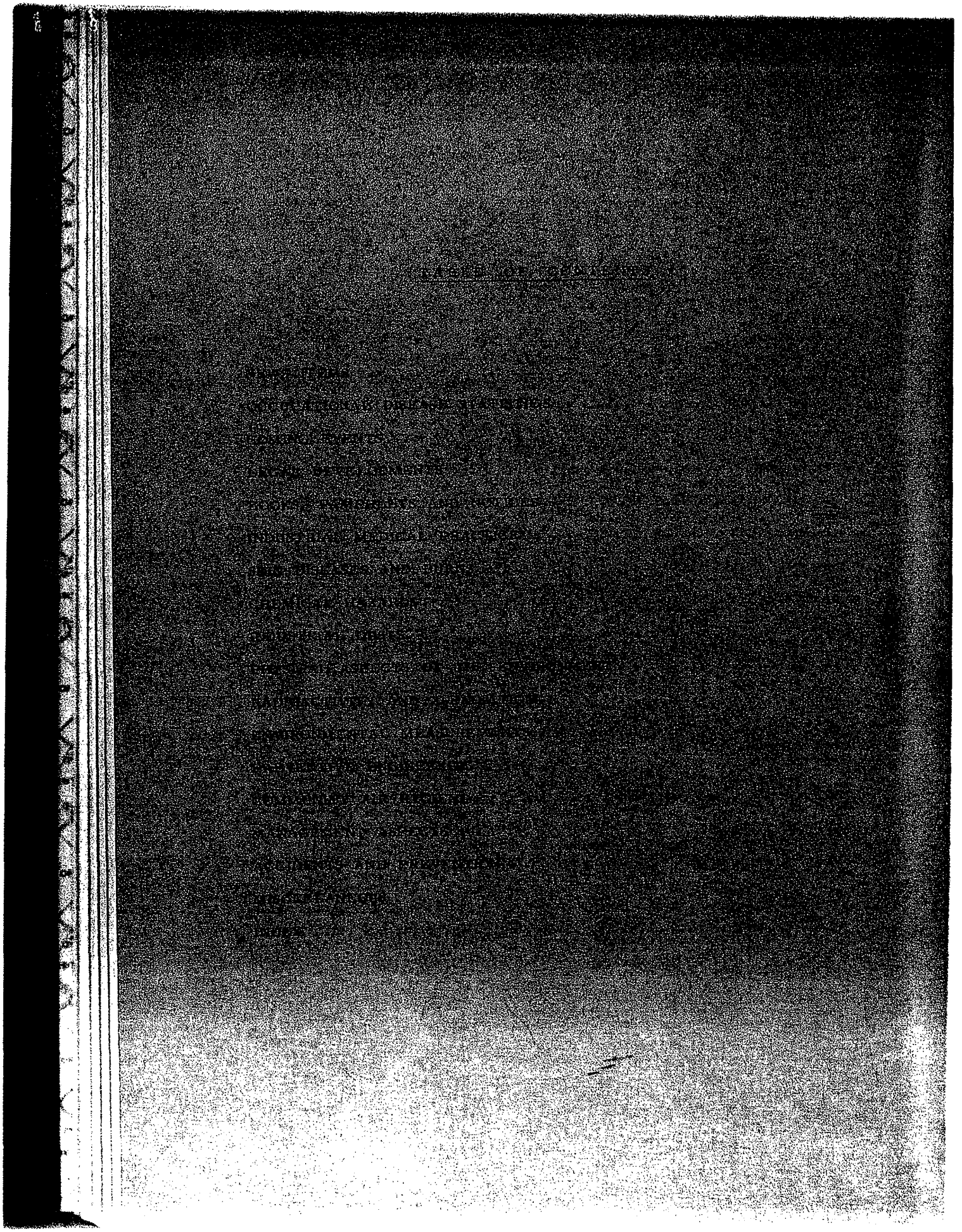
DR. H. H. SCHREIBER, former vice president of the American Chemical Society, has been named research chairman of the foundation. He is currently with the General Electric Company. He succeeds the late Dr. William F. Gray.

INDUSTRIAL HYGIENE FOUNDATION has announced that it will hold its annual conference in Cincinnati, May 1963. The conference will be held at the Sheraton Hotel. The managing director, William F. Schreiber, will be in charge of the conference. The conference will be held at the Sheraton Hotel, Cincinnati, Ohio. The conference will be held at the Sheraton Hotel, Cincinnati, Ohio. The conference will be held at the Sheraton Hotel, Cincinnati, Ohio.

NEW REPRINT available from the foundation is "The Role of the Industrial Hygienist in the Control of Air Pollution," by Theodore H. Smith. It is available for \$1.00 per copy.

1963 ANNUAL MEETING

OCTOBER 23-24, 1963



INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

400 First Postgraduate Course in Occupational Medicine: Environmental Physiology, June 10 through 14, 1963.

The Department of Preventive Medicine of The Ohio State University and The American Academy of Occupational Medicine announce the first of a series of postgraduate courses, each dealing with one of the fields essential to the practice of Occupational Medicine. The faculty will consist of leading figures in the specific areas of discussion both outside of and from The Ohio State University. In this course the basic physical stressors of the environment will be considered and their effects on the various physiological systems responding to them. The resultant physiopathology and clinical manifestations and methods of prevention and treatment will be covered. The course is open to all physicians with preference to Fellows and Members of The American Academy of Occupational Medicine; registration is limited to 50. There is no tuition for Fellows of The American Academy of Occupational Medicine; tuition fee is \$15.00 for Members of The American Academy of Occupational Medicine; and \$60.00 for Non-Members. These fees cover all meetings; informal banquet on June 11, coffee breaks and campus parking. Further information is available from The Ohio State University, The Center for Postgraduate Medical Education, John A. Prior, M.D., Director, 1645 Neil Avenue, Columbus 10, Ohio.

401 Meeting of Food and Drug Officials.

The Association of Food and Drug Officials of the United States (AFDOUS) will hold its 67th annual conference at the Jack Tar Hotel in Lansing, Michigan, June 16-20. Top authorities in the field will present papers on combating quackery in medicine, advertising health products, deceptive packaging legislation, food chemicals standards, food plant inspections, and related subjects. George P. Larrick, Commissioner of the Food and Drug Administration, will present a report on activities of the agency in the area of consumer protection. For further information write the Association at 607 Lewis Cass Building, Lansing 13, Michigan.

-- Chem. Eng. News

402 Symposium on Gas Chromatography.

The 4th International Symposium on Gas Chromatography, sponsored by the Instrument Society of America, will be held June 17 to 21 at Kellogg Center, Michigan State University, East Lansing, Michigan. Paper titles and abstracts should go immediately to Dr. Warren Brandt, Chemistry Department, Kansas State University, Manhattan, Kansas. Send completed papers by May 15 to ISA Headquarters, 530 William Penn Place, Pittsburgh 19, Pa. A featured speaker at the meeting will be Dr. A. J. P. Martin, winner of the 1958 Nobel Prize in Chemistry for the invention of partition chromatography.

-- Chem. Eng. News

OCCUPATIONAL DISEASE STATISTICS

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

	Conn. Feb.	Mich. June 1962-Mar. 1963	Pa. Mar.-Apr.	Total
Dermatitis	14*	52	22	88
Emphysema (suspected)			1	1
Fumes (unidentified)			2	2
Lead poisoning			1	1
Nephritis (toxic)			1	1
Pneumoconiosis		12	22	34
Pneumoconiosis (suspected)			17	17
Silicosis	1	52	1	54
Silicosis (suspected)			8	8
Toluene diisocyanate poisoning	2			2
Miscellaneous		1		1
Total	17	117	75	209

* Causes are listed as follows:

Connecticut: Occupational dermatitis due to oil and greases (and metal cutting compounds) 1; occupational dermatitis due to solvents 4; occupational dermatitis due to other chemicals: inks 1, miscellaneous 1, multiple chemicals 1, multiple causes 1, synthetic resins or resin (plastic compounds) 1, undetermined 1; occupational dermatitis—other: miscellaneous 1, soaps or detergents 2.

COMING EVENTS

- 404 June 6-8 Chemical Institute of Canada, Annual Conference and Exhibition, Toronto, Ont.
June 6-8 Manufacturing Chemists' Assoc., 91st Annual Meeting, White Sulphur Springs, West Virginia.
- June 7-13 Long Island Biological Assoc., 28th Annual Cold Spring Harbor Symposium on Quantitative Biology, Cold Spring Harbor, New York.
- June 9-12 National Plant Food Institute, Annual Convention, White Sulphur Springs, W. Va.
- June 9-13 Air Pollution Control Assoc., 56th Annual Meeting, Detroit, Michigan.
- June 10-12 American Neurological Assoc., Atlantic City, New Jersey.
- June 10-14 Canadian Medical Assoc., Toronto, Ontario.
- June 10-14 Gordon Research Conferences, Hydrocarbon Chemistry. New London, N.H.
Chemistry and Physics of Liquids. New Hampton, N.H.
Lipide Metabolism. Meriden, N.H.
Biochemistry and Agriculture, Tilton, N.H.
- June 13-14 American Rheumatism Assoc., Atlantic City, New Jersey.
- June 13-15 Navy Research and Development Clinic, Ohio State University, Columbus, Ohio.
- June 15-16 American Diabetes Assoc., Atlantic City, New Jersey.
- June 16-18 Lipide Symposium, University of Illinois, Urbana, Illinois.
- June 16-20 American Medical Association, Atlantic City, New Jersey.
- June 16-20 5th Annual National Industrial Pharmaceutical Research Conference, Land O'Lakes, Wisconsin.

June 16-21	Association of Food and Drug Officials, 67th Annual Meeting, Lansing, Mich.
June 17-20	American Meteorological Society, Joint Session with IAS/ARS on Ozone and Other Atmospheric Contaminants, Los Angeles, Calif.
June 17-20	Society for Investigative Dermatology, Atlantic City, New Jersey.
June 17-21	Gordon Research Conferences. Nuclear Chemistry, New London, N.H.
	Nucleic Acids. New Hampton, N.H.
	Cell Structure and Metabolism. Meriden, N.H.
	Air Quality Criteria, Tilton, N.H.
June 18-21	4th Biennial International Gas Chromatography Symposium. Instrument Society of America. Michigan State University, East Lansing, Michigan.
June 20-21	Nutrition Society of Canada, 6th Annual Meeting. University of Western Ontario, London, Ontario.
June 23-28	American Society for Testing Materials, 66th Annual Meeting, Atlantic City, N.J.
June 24-27	American Orthopaedic Association, Hot Springs, Virginia.
June 24-28	Gordon Research Conferences. Polymers. New London, N.H.
	Proteins. New Hampton, N.H.
	Physical Metallurgy. Meriden, N.H.
	Magnetic Resonance. Tilton, N.H.
June 26-29	National Society of Professional Engineers, Annual Meeting, Cleveland, Ohio.
June 30-July 4	International College of Surgeons, Bretton Woods, N.H.

Total

88
1
2
1
1
34
17
54
8
2
1

09

LEGAL DEVELOPMENTS

405 Blowby Criteria Approved.

The New York State Air Pollution Control Board has approved the following blowby criteria: The crankcase ventilation system shall prevent the emission to the atmosphere of at least 80% of the blowby that can be attributed to most vehicles. The crankcase ventilation system shall be so designed that it will have no adverse effect on engine operation or vehicle performance. The crankcase ventilation system shall not cause oil loss from the crankcase. The crankcase system shall operate safely. The crankcase ventilation system must operate so as not to create excessive heat, noise or odor. Installation of the crankcase ventilation system shall not contribute to a noxious or toxic effect in the outdoor air. The crankcase ventilation system shall be built of materials that adequately prevent corrosion, erosion, fatigue and wear. They must be thermally stable under the conditions of use and be resistant to gasoline, oil, and other materials present in engines and outdoor air (including ozone and oxides of nitrogen) so as to promote durability. The crankcase ventilation system shall operate efficiently for at least 12,000 miles with normal maintenance. The New York State law provides that all motor vehicles registered in New York and manufactured or assembled after June 30, 1963, must be equipped with a crankcase ventilating system of a type approved by the Air Pollution Control Board.

-- Progress Report, N. Y. State Air Poll. Control Board

406 State and Local Agencies Should Control Air Pollution.

The Government should leave control of air pollution to state and local agencies. This is the position taken by the Manufacturing Chemists' Association (MCA) at hearings recently before a House Commerce Subcommittee. While endorsing the general theme of H.R. 4415, the Roberts Bill, MCA feels that all 3 bills before the Subcommittee place too much emphasis on "broad federal role" in air pollution abatement. MCA says: "It is our firm belief that these problems are being aggressively attacked by local, state, and regional authorities consistent with the attention which inhabitants of these areas desire." To superimpose federal authority would "discourage state and local enforcement people and impair their programs," MCA claims. MCA wants the Federal Government to concentrate on research, training, and technical assistance.

-- Chem. Eng. News

- 407 Legal Liability to Volunteers in Testing New Drugs. W. F. Bowker.
Can. Med. Assn. J. 88, 745-751 (Apr. 6, 1963).

Scientists test new drugs by giving them to volunteers. In spite of every precaution, the drug may harm the volunteer. Under Canadian law, can he recover damages against any of the persons connected with the test? He cannot succeed against the scientist if the latter had made complete disclosure of the risks and had then obtained the volunteer's free consent. Where the subject of a test is a child or one of unsound mind, the guardian's consent probably does not protect the scientist from a possible claim by the subject. Where a married woman is a volunteer, her husband's consent is unnecessary. The volunteer cannot succeed against his family physician who referred him to the scientist unless the physician took an active part in an experiment that was conducted negligently or without a proper consent. The volunteer cannot succeed against the maker unless he has negligently prepared the drug or given misleading information.

-- Author's abst.

- 408 Senate Attacks Hard Synthetic Detergents.

Attacks on hard synthetic detergents have spread to the Senate. S. 1183, sponsored by Senator Maurine Neuberger (D.-Oregon) and 2 other Senators, would forbid the importation or manufacture after June 30, 1965, of any synthetic detergent which did not meet standards of decomposability set by the Secretary of Health, Education, and Welfare. This bill is patterned after legislation introduced earlier by Rep. Henry Reuss (D.-Wisconsin) to reduce stream pollution caused by hard detergents. Senator Neuberger calls the bills "a sound and feasible approach to the detergent problem."

-- Chem. Eng. News

- 409 Glass Door Regulations.

Builders selling houses to buyers who finance with FHA-guaranteed mortgages will soon be required to comply with new glass door regulations. The new rulings will deal with minimum thicknesses, markings, wired glass, tempered glass, and laminated glass. Picture windows, as well as glass doors, will be affected by the new regulations. -- Natl. Safety News

BOOKS, PAMPHLETS AND NOTICES

- 410 The Pneumoconioses. A. J. Lanza, Editor. 154 pp. (Jan. 18, 1963).
AVAILABLE FROM: Grune & Stratton, Inc., 381 Park Ave., New York 16, N.Y. PRICE: \$7.50

The Pneumoconioses, edited by A. J. Lanza, is an interesting review of the subject by authors who have had extensive personal experience in the fields of its diagnosis, treatment, disability evaluation, prevention, pathology, and compensation. The editor states in the preface that our knowledge has increased in the 22 years which has elapsed since the publication of his previous text "Silicosis and Asbestosis" but that it is still far from complete. Most sections of the new book are self-contained and present a wealth of interesting background information. The sections on Pathology will be especially interesting to those not already familiar with the research being conducted by Dr. Paul Gross, of Industrial Hygiene Foundation. The sections on Asbestosis and Diatomaceous Earth Pneumoconiosis by Dr. Kenneth W. Smith, a Trustee of Industrial Hygiene Foundation, are also worthy of special mention. This book will be widely read and discussed by all those interested in the subject of pneumoconiosis. The chapter on Medicolegal Aspects of the Pneumoconioses by T. C. Waters, General Counsel to Industrial Hygiene Foundation, provides an up-to-date critique of compensation legislation.

-- R. T. P. deT.

- 411 Silicosis Hazard in a Lead and Zinc Mine in Rajasthan. Report No. 21.
 Government of India, Ministry of Labour and Employment. 78 pp. (1961).
AVAILABLE FROM: Office of the Chief Adviser of Factories, 2-A/3 Asaf Ali Road, New Delhi,
 India. PRICE: None given.

This is a medical and environmental study of the dust hazard at the Zawar lead and zinc mine in Rajasthan, India. This mine was opened in 1942. Environmental studies included a comparison of the weighted exposures of the different categories of workers. Only mill workers at the crushing plants were exposed to dust concentrations exceeding the threshold limits. The silica content of the rock averaged 22%. The medical study was made on a sample of 173 workers out of 606 miners and 101 workers at the concentration mill. The medical examination included a blood examination, vital capacity measurements, and a 15 x 12 posterior-anterior chest x-ray examination. The results obtained were that 52 (30.4%) of the workers had evidence of dust deposit in the lungs. In workers who had been employed only in the Zawar mine, the percentage was 21.2. On the other hand, 21 (84%) of the 25 workers who had also been employed in other mines showed evidence of pneumoconiosis which was of a higher category than that of the patients from the Zawar mine. The vital capacity measurements were not helpful. The blood examinations revealed that 31.5% of the workers suffered from anemia, the cause of which has to be investigated. Recommendations are given for improving the environmental conditions. Medical measures recommended are examinations of new entrants. The risk of employing workers from other mines is noted. Periodical x-ray examination of miners and certain surface workers is advised.

-- Cond. from Bull. Hyg.

INDUSTRIAL MEDICAL PRACTICE

- 412 The Dispersal of Staphylococci in Hospital Wards. W. C. Noble.
 J. Clin. Pathol. 15, 552-558 (Nov. 1962).

The air of 3 hospital wards was examined frequently for staphylococci for nearly 4 years using slit samplers. "Broadcasts" of staphylococci into the air were observed with the air count rising well above the mean of 0.2 staphylococcal particle per cu. ft., and these broadcasts often appeared to be due to single patients. Eight of the 3,675 patients admitted to the wards possessed an ability to disperse staphylococci into air of the wards which was markedly greater than normal. The actual dispersal about the ward appeared to be mediated by the bedcloths, for when these were disturbed, large numbers of staphylococci were disseminated into the air.

-- Public Health Eng. Absts.

- 413 Evaluation of Drugs in Industry. A Method for Comparing the Effectiveness of Drugs in the Treatment of Acute Functional Disorders. L. J. Warshaw and H. J. Bennett.
 Arch. Environmental Health 6, 227-234 (Feb. 1963).

A method has been elaborated for comparing the effectiveness of drugs in the treatment of acute functional disorders that is particularly suitable for clinical pharmacology investigations conducted in the setting of the industrial medical department. Its essential features include: (1) the use of rigid arbitrary criteria for selecting suitable cases of acute functional disorder under investigation; (2) comparison of the drug being investigated with other more or less effective preparations and a placebo; (3) employment of a randomized block design for assigning suitable subjects to the different treatment groups; (4) use of the double-blind technique to minimize observer bias; (5) observation of the number of doses and the amount of time required to obtain the desired effect, the frequency of recurrences of symptoms following initial improvement, and the response of individual symptoms independently of the over-all response of the patient. As a demonstration of the manner in which it may be employed, a study is described in which this method was applied to the evaluation of several drugs in the symptomatic relief of acute gastrointestinal upset.

-- Authors' summary

- 414 Methodology in Industrial Health Studies. The Cohort Approach with Special Reference to an Asbestos Company. T. F. Mancuso and Elizabeth J. Coulter. Arch. Environmental Health 6, 210-226 (Feb. 1963).

The cohort approach, utilizing Bureau of Old Age and Survivors Insurance (BOASI) source data, can be effectively applied to the study of chronic illness in industrial populations. The research potential of BOASI records, separately and in conjunction with other sources of data, merits further special consideration and application in the study of a wide range of attributes related to industrial populations.

-- Authors' conclusion

- 415 Methodology in Industrial Health Studies. The Demographic Approach. T. F. Mancuso and Elizabeth J. Coulter. Arch. Environmental Health 6, 515-524 (Apr. 1963).

This paper provides a brief discussion of the demographic approach to studying the health of industrial populations. Specific mention was made of the importance of data on geographic location, including urban-rural and county residence duration of residence, sex, color, age, country of birth, and socio-economic factors. Particular reference was made to the interrelation of some of these factors.

-- Authors' summary

- 416 Decisive Thinking in the Prevention and Treatment of Emotional Disorders. P. J. Olivere. Ind. Med. & Surg. 32, 147-148 (Apr. 1963).

A simple, logical system of treating emotional disorders has been presented. It is successful because its principles are acceptable to the patient. It builds up his ego and self-confidence, removes his feelings of insecurity and inferiority, and changes his general negative attitude toward life to a positive attitude with a bright outlook on life. This is done simply by the correction of a bad thinking habit—worry—and the application of decisive thinking.

-- Author's summary

- 417 One Thousand Consecutive Contact Lens Cases. H. H. Boyd. Northwest Med. 61, 933 (Nov. 1962). (Northwest Medicine, Northwest Medical Publishing Association, 500 Wall Street, Seattle 1, Washington*):

Problems of fitting and wearing contact lenses are discussed in relation to 1,000 cases of visual defect of various types. Women constituted 65.9% of the series. Previous failure had occurred in 104 cases, but eventually only 50 patients failed to achieve all-day wearing. Statistical review of the cases indicated that at least 55.5% of the individuals with defective vision can wear contact lenses for 8 to 10 hours the first day, and 54.4% can wear them all day long within 2 to 3 days. The fluorescein pattern technique was found, in this study, to be confusing and inaccurate, whereas the use of a slit lamp allowed adequate lens fitting. Although most contact lens wearers are myopic, large corneal astigmatism does not preclude the use of such lenses. One of the common problems encountered was loss of lenses, which occurred in 30% of the cases reported. It is recommended that some form of replacement be offered to the patient by duplicating the lenses exactly, without repeat fitting sessions. The lenses must be checked from the laboratory, even if the laboratory is part of the ophthalmologist's own office. Failure can be reduced to a minimum by using good lenses with a radius matching that of the cornea. The incidence of complications such as development of edema of the epithelium, conjunctivitis, and corneal abrasion is discussed, and suggestions for relief and prevention of such complications are presented. No permanent pathological consequences from the use of contact lenses was recorded in the series reported.

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

- 418 Measurement of Blood Cholinesterase. R. F. Witter. Arch. Environmental Health 6, 537-563 (Apr. 1963).

The analyst has a variety of methods available for the assay of blood cholinesterase. The assay of serum or red cell cholinesterase can be carried out on the separated portions of

* Address not in current List of Periodicals.

blood or on whole blood using specific substrates. The most accurate and sensitive methods are the recording titrimetric and Warburg manometric procedures in which the amount of acid is measured stoichiometrically. Both of these methods are of great versatility and can be applied to the study of kinetics of inhibitors or activators and to the study of a variety of other experimental conditions, since rate curves are obtained. The Warburg procedure cannot be used for the study of the effect of pH beyond the range of 7.2-7.7; on the other hand, the titrimetric method can be used to study the entire useful pH range. The titrimetric method is of particular value in the study of the kinetics of the initial phase of the reaction between inhibitor, substrate or activator, and the cholinesterase, since rate curves can be obtained within a period of 2 minutes. Titrimetric methods will become of increasing importance in this field. Errors involved in the determination of cholinesterase include possible contamination of the sample during the collection, failure to centrifuge properly, and inactivation of the enzyme by keeping the blood too long at room temperature. Blood for analysis should be separated into cells and plasma and shipped under refrigeration. The stability of whole blood is increased by drying on filter paper, and blood prepared in this way can be shipped at room temperature. However, the red cell cholinesterase is bound to the paper. Further research is needed to ascertain the effect of tropical conditions on the cholinesterases of blood on paper. There are 139 references in the bibliography.

-- Cond. from author's summary

- 419 Environment and Gastrointestinal Disease. T. Hunt.
Arch. Environmental Health 6, 188-209 (Feb. 1963).

Environmental studies may be expected to throw increasing light upon causative factors in digestive disorders and will be more and more needed as new methods of cultivation, preparation, preservation, and storage of food are developed and new social customs, stresses, and occupational hazards arise. Accurate epidemiological investigations on a world-wide scale provide an outstanding opportunity for increasing our knowledge of digestive diseases. There are 64 references to the subject in the bibliography.

-- Cond. from author's summary

- 420 Use of a Muscle Relaxant Salicylate Combination in Chronic Rheumatic Diseases. H. H. Tillis.
Ind. Med. & Surg. 32, 144-146 (Apr. 1963).

One of every 16 Americans has some form of arthritis and nonarticular rheumatism. Therapy will be continued for many years' duration. Therefore, there is a need for non-habit-forming analgesic agents which will fulfill the criteria of safety and effectiveness. Recent studies indicate that a muscle relaxant, an antihistamine, and a salicylate will provide an ideal combination for daily use in these patients for prolonged periods of time. In a double-blind study of more than one years' duration, a combination of a muscle relaxant, glyceryl guaiacolate; an antihistamine, phenyltoloxamine; and acetylsalicylic acid was given to 100 patients. Effective relief of symptoms of pain and muscle spasm was noted. No tolerance to the medication has developed. The use of these 3 drugs together was judged by the patients to be superior to results obtained with salicylates alone. Side effects were minimal, consisting only of nausea and gastrointestinal complaints of minor severity. A combination of a muscle relaxant, glyceryl guaiacolate; an antihistamine, phenyltoloxamine; and acetylsalicylic acid is recommended as adjunctive long-term therapy in patients with osteoarthritis, rheumatoid arthritis, and non-articular rheumatism.

-- Author's summary

- 421 Early Detection of Cancer Among Low-Income Groups. H. H. Whitted.
Arch. Environmental Health 6, 280-285 (Feb. 1963).

Three hundred Negro patients with malignant and non-malignant disease were studied. The relationships of several socio-economic factors to the early detection of cancer were reviewed. Present educational techniques to motivate low socio-economic groups to avail themselves of early cancer detection services are inadequate. The present program should be redesigned to incorporate educational techniques meaningful to this group. This approach will enhance efforts to detect cancer early in a group presently resistant.

-- Author's summary

422 Is Belgium Aware of a Human Distomatosis Problem? R. Vanbreuseghem, et al.

Belg. T. Geneesk. 10, 467-479 (1962).

(Belgisch Tijdschrift voor Geneeskunde, Minderbroedersstraat 12, Louvain, Belgium*).

With regard to 2 small outbreaks (one in the province of Luxembourg and one in Henegouwen) the extent of the problem is discussed. In Belgium, watercress is also a source of infection. The supply of watercress in that country is discussed and the prophylactic measures described.

-- Public Health Eng. Absts.

423 Brucellosis. J. A. Hinchiffe. Sanitarian (London) 71, 3-12, 18 (Oct. 1962).

Brucellosis, more correctly called undulant fever, as a human disease is broadly discussed within the area of the public health inspector's work and interest. In addition to an introductory historical section and final conclusion, 4 main headings were discussed: (1) the organism and its source and reservoir; (2) infection of men; (3) detection; (4) control. There are 14 references to the subject.

-- Public Health Eng. Absts.

424 Observations on 125 Cases of Viper Bite. P. Ephrati. Harefuah 63, 315 (Nov. 1, 1962).

Of the 125 cases of viper bite reviewed by the author, 3 are described in detail. One of these presented the classical course of envenomization; cerebral edema as a manifestation of Quincke's allergic edema developed in the second one, and prolonged hypotension, probably as the result of damage to the adrenal medulla, was observed in the third one. Jaundice (hepatocellular), fever, and melena were observed in other patients. Of the total number, 77 were mild cases, 26 moderately severe, 13 severe, 6 very severe, and 3 fatal. Shock developed in 27 of the patients. A tourniquet was applied in 33 patients, but its therapeutic efficacy cannot be definitely estimated. In 24 cases the tourniquet was suddenly released; in 6 of these rapid progression of the local lesions took place, and in 12 manifestations of general envenomization ensued. Non-specific treatment in the form of fluids, blood, or norepinephrine did not noticeably change the course of the severe cases. Antivenom serum was given to 46 patients, but only 14 received it in adequate quantities (40 ml. or more). Early treatment with antivenom serum shortened the period of hospitalization in the severe cases. When the administration of serum was delayed, hospitalization was prolonged. In patients in whom signs of general envenomization appear early, the author recommends the intravenous administration of from 50 to 80 ml. of serum. However, the use of large doses of antivenom serum involves dangers; a case of neuritis of the brachial plexus is described.

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

SKIN DISEASES AND BURNS

425 Neurodermatoses in Industry: A Psychosomatic Approach. Sadie H. Zaidens.

Ind. Med. & Surg. 32, 127-130 (Apr. 1963).

The neurodermatoses occur in those who are either unduly submissive, with resulting sullen resentment, or those who are unusually ambitious, but who dare not express it for fear of recriminations. In both situations, repressed frustration and impotent rage are produced. The skin lesions represent the acting out of the repressed frustration and impotent rage that patients fear to express consciously.

-- Author's summary

* Address not in current List of Periodicals.

- 426 Betamethasone: A Dermatological Clinical Evaluation. J. L. Danto, et al.
Can. Med. Assn. J. 88, 670-671 (Mar. 30, 1963).

The purpose of this study was to determine under carefully controlled clinical conditions the relative anti-inflammatory and anti-pruritic action of betamethasone as compared with prednisone and a placebo. A total of 130 consecutive patients with atopic dermatitis, primary irritant dermatitis, nummular eczema, allergic eczematous contact dermatitis, sweat retention, seborrheic dermatitis and pruritus were selected for study. Under the conditions of this clinical trial, the samples indicated a difference in anti-inflammatory and anti-pruritic response to the therapeutic agents used. The difference between betamethasone and the placebo was highly significant, and the difference in these measured responses was studied on the basis of a careful evaluation and statistically. The result of this study corroborates statistically the authors' impression regarding the therapeutic effect of betamethasone.

-- Authors' abst.

- 427 Identification of a Simple Chemical Compound (Chlorogenic Acid) as an Allergen in Plant Materials Causing Human Atopic Disease. S. O. Freedman.
Am. J. Med. Sci. 244, 548-555 (Nov. 1962).

The use of crude, impure extracts for skin testing has been one of the major obstacles to progress in the field of allergy. This investigation was concerned with the identification of chlorogenic acid (a simple phenolic compound of low molecular weight), as an allergen in 3 plant substances. In a study of occupational allergy in the coffee industry, it was found that workers who developed asthma, rhinitis, or dermatitis on exposure to finely dispersed coffee dust gave positive intradermal reactions to aqueous extracts of green coffee bean. When these extracts were fractionated by chromatography on dextran gel, skin test activity was primarily associated with a fraction containing large quantities of phenolic compounds. Skin tests were performed with all of the known polyphenolic compounds in coffee. Only chlorogenic acid produced positive reactions. Cross-neutralization experiments demonstrated that chlorogenic acid completely neutralized reaginic antibodies to whole coffee extract. Castor bean, a highly allergenic substance, is known to produce positive intradermal reactions in coffee allergic patients and vice versa. Chlorogenic acid was identified as a constituent of castor bean by paper chromatography and by infrared spectroscopy. Complete cross-neutralization was obtained between chlorogenic acid and castor bean. Using similar methods, chlorogenic acid was found to be present in oranges. Furthermore, it produced positive skin tests in patients allergic to oranges and neutralized reaginic antibodies to orange. Because polyphenolic compounds are so widely distributed throughout the plant kingdom, these observations may be useful in the search for the allergenic constituents of other food, pollens, dusts, or molds.

-- Public Health Eng. Absts.

- 428 Contact Eczema from Industrial use of Hydrazine Derivatives with Group Hypersensitivity to Hydralazine (Apresoline) and Isoniazid (INH). K. E. Malten.
Ned. Tijdschr. Geneesk. 106, 2219 (Nov. 3, 1962).

In recent years hydrazine compounds have been widely used in industry, in the production of pharmaceuticals, of insecticides, of dye stuffs, of rocket fuels, in the manufacture of leather, glass, textiles, in color photography, and in preparations for permanent waves. Literature reports are cited in which occupational contact with hydrazine derivatives produced contact dermatitis. Hydrazine derivatives are also used in a number of pharmaceutical preparations; phenylhydrazine is used in the treatment of polycythemia, hydralazine in hypertension, and isoniazid against tuberculosis. The contact dermatitis resulting from the industrial use of hydrazine derivatives may result in hypersensitivity to the aforementioned drugs.

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

- 429 Resistance to Infection in Burned Patients. H. H. Balch, M. Watters and D. Kelley.
Ann. Surg. 157, 1 (1963).

In a study of the defense mechanism of severely burned patients against pathogenic bacteria, it was demonstrated that the blood bactericidal capacity was elevated against coagulase-positive Staph. aureus and normal against Staph. albus, E. coli and Pseudomonas aeruginosa.

The cellular reaction to peripheral injury was markedly depressed for several days, and there was a delay in the appearance of lymphocytes with an absence of eosinophils. Terminal bacteremia in a severely burned patient was detected at a time when blood bactericidal capacity began to decrease, a marked leukopenia occurred and the cell response to peripheral injury was depressed. Transient bacteremia sometimes occurred when there was a decreased cell response to periphery injury when the wound bacterial count was high in spite of an adequate blood bactericidal capacity. The balance between bacterial invasion and host resistance was continuously shifting. Blood stream invasion by *Staph. aureus* (phage type 80/81) was more likely when the initial high post-traumatic bactericidal effect had returned to normal. The primary cause of bacteremia in burned patients probably is the presence of a high bacteria/cell ratio in the wound, especially if the micro-organisms are pathogenic.

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

CHEMICAL HAZARDS

430 Nitrogen Tetroxide Exposure in the Missile Industry.

P. J. Clancy, S. L. Watson and J. B. Reardan. *J. Occ. Med.* 4, 691-693 (Nov. 1962).

Sixteen men were exposed to nitrogen tetroxide for 1-2 minutes. Most of the men subsequently experienced paroxysms of cough; they were given oxygen inhalation and recovered completely after 24 hours. One man became seriously ill. He was apneic and cyanotic on arrival at the aid station, where he was given oxygen and artificial respiration. His pulse was 102 and thready, his blood pressure 92/60, and his respirations feeble. Chest roentgenogram and laboratory tests showed no abnormality. Two hours after exposure the patient was complaining of chest pain and dizziness and had a dry, hacking cough. Five hours after the incident he was hospitalized. The chest film was again negative. The x-ray taken 18 hours after the exposure showed diffuse disseminated, nodular densities throughout the lung parenchyma. The second day after exposure there was some extension of the process. On the third day the symptoms were improved. The patient was afebrile and returned home. One month after exposure, the patient complained of a 10.9 kg. (24 lb.) weight loss, shortness of breath, chest pain, and occasional coughing-up of blood-tinged sputum. He was rehospitalized. X-rays showed definite fine nodular densities. He was given 80 units of corticotropin (ACTH) intravenously, and dexamethasone in a dose of 2.5 mg. 3 times /day; an ulcer diet was begun. Forty-eight hours after therapy was started, the roentgenogram showed a decrease in the size of the nodules. The patient was discharged on a reduced dosage of dexamethasone. Three weeks later he was deemed able to perform light work. About 3 months after exposure to nitrogen tetroxide the patient had no work intolerance and his lung function was within normal limits.

-- Cond. from *J. Am. Med. Assn. References & Reviews*

431 Polyoxyethylene(8)-Stearate. Carcinogenic Studies. W. C. Hueper and W. W. Payne. *Arch. Environmental Health* 6, 484-494 (Apr. 1963).

The experimental evidence presented and interpreted in the light of available competent human and experimental experience indicates that bladder stones, irrespective of their chemical composition, are not primary causes of cancer of the bladder. The observations reported confirm the previously reported finding that rats fed polyoxyethylene(8)-stearate at a 25% level develop benign and malignant tumors of the bladder. They demonstrate, moreover, that this chemical directly introduced into the bladder of rats has a like effect and that mice fed this emulsifier also develop papillomas and carcinomas of the bladder mucosa. Polyoxyethylene(8)-stearate must be considered to be a primary carcinogen which owes its carcinogenic property either due to a direct action of one or several ingredients present in this chemical mixture when excreted with the urine or due to a carcinogenic metabolite produced from one of the various chemicals composing this mixture. Different batches of polyoxyethylene(8)-stearate vary in their relative carcinogenic potency. Such fluctuations apparently are attributable to a lack of uniformity in the chemical composition of this product. Because of this insufficient standardization of the

commercial product and considering the distinct variations in carcinogenic potency resulting therefrom, it is most unwise to draw any definite conclusions as to the safety of this product for the human consumer, especially since it is not only a primary carcinogen but appears to exert also an injurious effect upon the gastric mucosa and liver. -- Authors' summary

- 432 Test for Hypersusceptibility to Hemolytic Chemicals. H. E. Stokinger and J. T. Mountain. Arch. Environmental Health 6, 495-502 (Apr. 1963).

The authors have suggested that a predictive test defining abnormal human susceptibility of the red blood cell to hemolytic drugs be extended and applied to detect similar hypersusceptibility among workers exposed to industrial chemicals known to affect the red blood cells. Hypersusceptibility to hemolytic chemicals has been shown to reside in a hereditarily transmissible defect of the red blood cells. This defect is manifested by a fault in the glucose metabolism of the red cell that can be readily detected by a simple, visual methemoglobin reduction test. Although the incidence of the defect varies widely according to race and subgroup, it is known to be 12% for the American Negro male and about 0.1% for the American white male; other racial groups possess the defect to varying degrees up to 60%. Industries handling chemicals that affect the red blood cell might well wish to explore the practicability of this test in the preplacement medical examination in order to screen those individuals with predicted hypersusceptibility to hemolytic chemicals before job assignment. Approximately 1,000,000,000 workers are involved in the manufacture of industrial chemicals; a number several times that are exposed to chemicals through handling and use. -- Authors' summary

- 433 Functional Testing for Behavioral Toxicity: A Missing Dimension in Experimental Environmental Toxicology. J. B. Ruffin. J. Occ. Med. 5, 117-121 (Mar. 1963).

There are several dimensions to the question of toxicity testing. A crucial, and for the most part undeveloped, dimension is that of behavioral toxicity. It is suggested (1) that the subject of behavioral toxicity be accorded its proper status (close to the top the author thinks) in the hierarchy of toxicity study criteria, and, if genuine progress is to be made, (2) that at least a few environmental toxicologists consider evolving into psychotoxicologists, just as pharmacologists have in some instances been successful in becoming competent psychopharmacologists; or in any event, that studies of behavioral activity attempted by toxicological research groups be accomplished by integrated teams of experimental psychologists and those with traditional experience. A review of any monograph dealing with the complex behavioral effects of drugs, the various and multiplying techniques existing for their assessment, and the conclusions to be drawn from such data, will readily convince the progressive toxicologist that worthwhile work is not likely to be accomplished in this dynamic field without the active participation of the well trained experimental psychologist. -- Cond. from author's conclusion

- 434 Alterations of Blood Coagulation in Some Industrial Intoxications. L. Salamone. Med. lavoro 53, 36-44 (Jan. 1962). Italian.

This investigation consists of a survey of published work. Starting with phosphorus and chloroform and early work on prothrombin, it goes into some detail on the changes which occur during poisoning in the complex range of factors concerned in blood clotting—dealing especially with carbon tetrachloride among poisons and with modification of thromboplastin and prothrombin activities among coagulation tests. Reduced coagulation power is described from carbon tetrachloride, paradichlorobenzene, benzol, lead, arsenic, and carbon disulfide. (Trilene, methyl chloride, methyl bromide, paraphenylenediamine, mercury and cadmium are among poisons briefly mentioned). An increased clotting tendency results from asphyxia from, for example, smoke. A biphasic reaction occurs in cyanide poisoning (also in acute carbon tetrachloride poisoning). This brings the discussion to the effects of shock. Such biphasic reactions vary according to the stimulus and are fleeting. Variables such as age and the state of health and many others may limit the value of results of some factors. The alterations in blood coagulation which are described are considered to be due to a specific action of the toxic substance on liver and marrow and also to a non-specific stress reaction and there is the possibility of differentiating between the two mechanisms by an evaluation of some of the chief coagulation tests. -- Cond. from Bull. Hyg.

- 435 Fluoride Exposure and Worker Health. O. M. Derryberry, M. D. Bartholomew and R. B. L. Fleming. Arch. Environmental Health 6, 503-514 (Apr. 1963).

Clinical and laboratory studies were conducted to assess the health of a group of workers exposed to fluorides as compared with a group of workers equivalent in age, race, and living standards without industrial exposure to fluorides. No disability attributed to fluoride exposure was encountered in any of the individuals in this study. Minimal or questionable degrees of increased bone density were found in 23% of the fluoride-exposed group. In no case was the bone change clear-cut or of sufficient degree to be recognized in routine radiological practice as increased osseous radiopacity. Abnormal findings related to the gastrointestinal and cardiovascular systems occurred in the two groups with approximately equal frequency. Those related to metabolic conditions and hematometry were found more frequently in the control group. These findings do not present evidence that exposure to fluorides produces adverse effects on these systems. The fluoride excretion level of 4 mg. of fluoride per liter in urine samples collected at the end of the work shift has been found to serve as a useful reference level for evaluating atmospheric fluoride exposure where industrial environmental concentrations vary widely and in determining the probability of incurring increased bone density.

-- Cond. from authors' summary

- 436 Pathology of Acute Salt Poisoning in Infants. N. W. Elton, W. J. Elton, and J. P. Nazareno. Am. J. Clin. Pathol. 39, 252 (Mar. 1963).

Six fatalities resulted from the accidental substitution for a period of 3 1/2 days of salt for sugar in the formulas of 5 newborn and one 8-month-old infant. The characteristic microscopic lesions was a dehydration shrinkage of the convoluted tubules in the kidneys. Three showed amorphous acidophilic casts in the collecting tubules. In one a necrotizing arteritis was found in the lung. Suppurative pneumonitis, often centered around vascular channels was noted in the 5 newborn. Brain lesions consisted of subarachnoid and intraventricular hemorrhage in 2; sagittal sinus thrombosis in one, and microscopic evidence of vascular thrombosis and balloon-like over-distention of capillaries of the leptomeninges or both in 4. Renal infarction associated with vascular thrombosis was noted in one infant. The common etiological factor is evidently hyperosmolarity, induced by hypernatremic hypertonicity of intravascular and interstitial fluid.

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

- 437 Assimilation and Metabolism of Chromium by Trout. P. O. Fromm and R. M. Stokes. J. Water Pollution Control Fed. 34, 1151-1155 (Nov. 1962).

Exposure of trout to different concentrations of chromium (as chromate) have shown that: the fish can accumulate chromium from water containing as little as 1 mg./1,000 liter of the metal; at a concentration of 0.01 mg./liter chromium and below, the uptake of chromium levels off after 10 days' exposure indicating excretion is equal to uptake; and uptake of chromium by fish is passive, thus the amount accumulated is dependent on the concentration in the water and the duration of exposure. The in vitro respiration of pyloric caeca, liver, and kidney tissue from fish exposed to 1 mg./liter chromium for up to 39 days was not significantly different from that of control fish. On the basis of the above findings, suggestions for the disposal of chromium wastes have been made.

-- Public Health Eng. Absts.

- 438 Potential Hazard of Exposure to Lead. I. Handling and Use of Gasoline Containing Tetramethyl-lead. R. A. Kehoe, J. Cholak, J. A. Spence and W. Hancock. Arch. Environmental Health 6, 239-254 (Feb. 1963).

The appraisal of the environmental conditions under which the employees of a taxicab company worked was accomplished, during each of 3 successive periods of the investigation. The observations, sampling procedures, and analytical determinations were made within the garage. The data on atmospheric lead in the garage at various times are presented. The grouped findings with respect to velocity of air movement, prevalent temperature, and concentration of carbon monoxide in the air of the garage, observed during the 3 periods of the observations are given. In view of the negative outcome of this investigation, from the aspect of the revelation of a potential hazard due to the absorption of lead in association with the use of tetramethyllead,

there appears to be no hygienic reason against its use. The importance of the factor of time, however, in relation to the potential hazard of lead absorption, certain appropriate observations, comparable in principle to those which have characterized this investigation, will be required from time to time in the course of the commercial distribution of gasoline containing tetramethyllead to establish the significance, if any, of the incremental increase in the lead exposure of certain groups of persons who handle gasoline.

-- APCA Absts.

- 439 Potential Hazard of Exposure to Lead. II. Further Investigations in the Preparation, Handling, and Use of Gasoline Containing Tetramethyllead. R. A. Kehoe, et al.
Arch. Environmental Health 6, 255-272 (Feb. 1963).

A survey of the principal points within the area at which gasoline containing tetramethyllead was to be prepared for the market and distributed by an oil company resulted in the selection of sites at which analyses of the air would be carried out systematically. The frequencies of occurrence of the various ranges of the concentration of organolead in the air at several locations in two refineries, the mean levels of concentration, and the deviations are shown. The results of the investigation of the potential hazard of the absorption of lead, in the industrial and commercial activities involved in the handling of an antiknock compound containing tetramethyllead in a petroleum refinery, and with the distribution of gasoline containing this compound of lead have been summarized. The results demonstrate that the exposure of the groups of workmen to tetramethyllead, under the prevalent environmental conditions of their occupations are negligible.

-- APCA Absts.

- 440 Inhalation of Tetramethyllead and Tetraethyllead. R. K. Davis, et al.
Arch. Environmental Health 6, 473-479 (Apr. 1963).

Both tetramethyllead and tetraethyllead have proved to be more toxic for dogs than for rats; tetraethyllead was somewhat more toxic for rats than tetramethyllead, although the difference was not great, while tetramethyllead was considerably more toxic for dogs than was tetraethyllead. Comparison of data obtained by the analysis of the urine indicates that higher concentrations of lead were found in the urine of both species when tetraethyllead was inhaled and that higher concentrations of lead were found in the urine of rats than in that of dogs, regardless of the compound. Thus, no consistent correlation is found between the concentration of lead in the urine and the time of onset or severity of the involvement of the central nervous system of the animals. It is possible that significant correlations may develop out of the use of more refined analytical procedures, capable of distinguishing quantitatively between inorganic lead and various forms of organic lead in the urine. Preliminary experiments in this direction have indicated that almost half of the lead excreted by rats subjected to the inhalation of tetraethyllead is in organic form, un-ionized, or monovalent. The differences in the toxicity of the different degradation products of tetraethyllead, to be shown in a later paper, emphasize the importance of this approach. The concentrations of lead in the kidney and in the urine of rats that had inhaled tetramethyllead, as compared to those in the corresponding specimens from rats that had inhaled tetraethyllead, suggest that the metabolites of tetramethyllead may accumulate or be retained in the kidney to a degree that is reminiscent of the behavior of certain compounds of mercury.

-- Cond. from authors' summary

- 441 The Acute Effects of Lead Alkyls. F. Springman, Eula Bingham, and K. L. Stemmer.
Arch. Environmental Health 6, 469-472 (Apr. 1963).

The purpose of this investigation was to make comparisons of the effects exerted upon animals by the various orally administered dosages of each of the compounds, tetramethyllead, tetraethyllead, trimethyllead chloride, triethyllead chloride, and diethyllead dichloride. Triethyllead ion has recently been shown by Cremer and by Stevens, Feldhake, and Kehoe, to be a major metabolic product of tetraethyllead, and some evidence for the formation in the body of the trimethyllead ion from tetramethyllead has been presented recently by Cremer and Callaway. It is possible that the dimethyllead and diethyllead ions are also formed *in vivo*, but this has not been demonstrated. The observations here reported confirm those of earlier investigators who have described the signs of illness, observed the length of the survival of fatally poisoned animals, and recorded the lethal dosages of tetramethyllead, tetraethyllead, and the organolead

chlorides mentioned above, when administered to several species of animals by various routes. The data presented here extend the earlier work by showing changes in the body weight of animals after the administration of these organolead compounds, and by describing, briefly, the pathologic changes associated with the intoxication induced by the administration of these compounds in the manner indicated.

- 442 Absorption and Excretion of Mercury in Man. II. Urinary Mercury in Relation to Duration of Exposure. A. C. Ladd, L. J. Goldwater and M. B. Jacobs.
Arch. Environmental Health 6, 480-483 (Apr. 1963).

An attempt has been made to correlate duration of exposure and urinary mercury levels in men working with a variety of mercury compounds, predominantly organic. In 3 out of 4 sets of observations there were indications that in those men having the longest exposure the urinary mercury levels are highest. The fourth set of observations was equivocal. Statistical analysis of figures published by other observers fails to confirm the occurrence of diminishing excretion of mercury in humans after prolonged exposure. Possible differences in the behavior of inorganic and organic mercurials, of different exposure levels, and of males and females require further study.

-- Authors' summary

- 443 Anti-Rust Proofing by Zinc Galvanizing (Hot Dipping). A Report of Suspected Clinical Hazards ("Metal Ague") and Local Dangers (Burns) Encountered in this Industry. G. I. Faerber.
S. African Med. J. 36, 297-299 (1962).

A brief outline of the practice of industrial hygiene in Germiston has been described, and some specific difficulties (occupational health and engineering problems) associated with the process of hot-dip galvanizing have been detailed.

-- Public Health Eng. Absts.

- 444 Cardiovascular Lesions Caused by Dyes Containing Paraphenylenediamine. G. Izar.
Riforma Med. 76, 1101 (Oct. 6, 1962).
(Riforma Medica, La., Discesa Trinita Maggiore 53, Naples, Italy*).

Cardiovascular lesions, with hyposystole, edema, hepatic and pulmonary stasis, and coronary disease symptoms, were observed in 3 women aged 34, 39, and 52 years respectively, who were using a hair-tinting lotion with a paraphenylenediamine base. These disorders were attributed to the toxic effect of paraphenylenediamine, and several hypotheses were presented to explain the mechanism of this toxicity. It was concluded that the cardiovascular phenomena observed were mainly caused by endocrine imbalance. This hypothesis is confirmed by the fact that most women presenting such disorders in connection with the use of paraphenylenediamine lotions are going or have recently gone through the menopause, or have menstrual disorders. It is recommended that any lotion containing the so-called instant-tinting substances be discarded, and that legal measures be taken in order to prevent the manufacturing and selling of such preparations.

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

- 445 Acute Carbon Tetrachloride Intoxication. R. D. Stewart, et al.
J. Am. Med. Assn. 183, 994-997 (Mar. 23, 1963).

Excessive absorption of carbon tetrachloride results in a clinical complex manifesting depression of the central nervous system followed by hepatic and renal damage. Infrared analysis of the breath is a rapid, specific means of establishing the diagnosis and estimating the amount of drug absorbed. Prompt initiation of intravenous therapy with mannitol may minimize the renal damage and prevent renal failure. These principles are illustrated by the case history of a woman aged 29 who, in an unsuccessful attempt at suicide, ingested a mixture of carbon tetrachloride and methanol.

-- Authors' abst.

* Address not in current List of Periodicals.

- 446 Industrial Hygienic Experience with Carbon Tetrachloride in Railway Workshops.
L. Dellian and H. Wittgens.
Zentr. Arbeitsmed. u. Arbeitsschutz 12, 216-223 (Sept. 1962). German.

In the German railway system carbon tetrachloride (CCl_4) is widely used for cleansing purposes and as a fire extinguisher. In telephone installations, where a non-inflammable solvent is necessary in the event of sparking of the relay circuit, automatic exhaust ventilation is provided, but when the work is done by hand the operator's nose and mouth are about 30 cm. from the vessel containing the solvent and the movement of the brush cause a fine spray. The solvent, under the harmless-sounding name of Benzinoform, is sometimes used carelessly. The case is quoted of a foreman aged 54 years using CCl_4 in these conditions for 4 years. He complained of headache of a year's duration, and during clinical examination, of colic. The liver was enlarged and soft, and under laparoscopy yellow-red, with indefinite lobular markings. Serum transaminase was increased and there was a slightly increased retention of bromophthalein, but electrophoretic and serum lability tests showed no deviation from normal. After treatment, liver biopsy 14 months later showed a fatty liver; there was no disturbance of renal function. The atmospheric concentration of CCl_4 during cleaning at the breathing level was 25 ppm. It is now suggested that for these purposes, CCl_4 shall be substituted by benzine, perchloroethylene or a mixture of these. Floor polishes containing CCl_4 are no longer used in the German railway system. In the cleaning of oxygen containers, fittings and pipes, it is suggested that in spite of the explosive properties of trichloroethylene it is preferable to CCl_4 .
-- Cond. from Bull. Hyg.

- 447 Health Hazards of the Pesticides Endrin and Dieldrin. H. R. Wolfe, W. F. Durham and J. F. Armstrong. Arch. Environmental Health 6, 458-464 (Apr. 1963).

Studies were carried out to determine the health hazards associated with the use of two of the more toxic chlorinated hydrocarbon pesticides, endrin and dieldrin, under conditions of some of their agricultural uses in the Pacific Northwest. Dermal exposure of spray-equipment operators was determined by exposing absorbent alpha-cellulose pads on various parts of their bodies for one or more complete cycles of spraying or dusting. Contamination of hands was measured either by rinsing in alcohol in a polyethylene bag or by swabbing with alcohol-impregnated gauze swabs. Respiratory exposure was estimated from the contamination of filter pads of respirators worn during pesticide application operations. The calculated exposure to endrin while dusting potato fields was 1.8% of a toxic dose per hour of exposure. While spraying endrin on orchard cover crops for mouse control, and while spraying dieldrin on pear orchards, the calculated exposure was only 0.2% and 0.3% of a toxic dose per hour, respectively, for each of the operations. Added exposure to endrin as a result of smoking while spraying orchard cover crops was found to be no more than 0.002 mg. per cigarette, even when cigarettes were handled with hands wet with the dilute spray. Endrin residues on sprayed orchard grass and fescue were very persistent during cool conditions encountered in fall and winter months. Grass sprayed in late October at the recommended dosage, resulting in initial residues of 60 to 240 ppm, still showed 25 to 100 ppm 5 months later. During this period, the grass remained somewhat palatable to livestock, but animals, especially milk cows, should not be allowed to feed on such treated cover crops.
-- Cond. from authors' summary

- 448 Oral Occupational Parathion Poisoning Treated with 2-Pam Iodide (2-Pyridine Aldoxime Methiodide). G. E. Quinby, T. A. Loomis and H. W. Brown.
New Engl. J. Med. 268, 639-643 (Mar. 21, 1963).

A severe case of occupational parathion poisoning occurred in a tree sprayer after 7 years of intermittent exposure with no reasonable explanation of exposure sufficient to cause illness other than exposure by the oral route. The parantrophol excretion pattern was consistent with this premise. This case is believed to be the first that has been reasonably established as oral occupational poisoning associated with parathion. A cholinesterase reactivator, 2-pyridine aldoxime methiodide, was used, with excellent results, to supplement atropine therapy, which had failed to control convulsions or to restore neuromuscular function. The administration of succinylcholine in a dosage usually producing only short-term, incomplete muscle relaxation in a normal person resulted in profound, prolonged flaccidity and apnea in this patient with prior cholinesterase depletion. Neuromuscular blockade was at least additive

if not potentiative. A portion of the 2-PAM iodide that was given to the patient was isotope tagged, and blood concentrations and urinary excretion of the isotope were followed. The 2-PAM is rapidly excreted in the urine so that in one hour 41% of the administered isotope was recovered in the urine. In 30 minutes blood isotope concentrations had fallen to approximately 50% of initial values.

-- Authors' summary

449 Estimation of Insecticide Residues in Foods Through Parallel Screening Methods.

W. F. Phillips and R. J. Schultheisz.

J. Agr. Food Chem. 10, 486-490 (Nov.-Dec. 1962).

A parallel screening system has been developed which provides a basis for detection, characterization, and estimation of most of the insecticides that inhibit cholinesterase or contain chlorine. The system consists of bioassay, organic chlorine, and acetylcholinesterase inhibition analyses of the same extract. Further information is obtained by mathematical treatment of the data which provides a high degree of selectivity. Data are presented for toxicants that are representative of the two major classes of insecticides.

-- Public Health Eng. Absts.

INDUSTRIAL DUSTS

450 Suppression of Dust in a Fertilizer Plant. F. J. Harris and T. Craig.

Brit. Chem. Eng. 8, 99-103 (Feb. 1963).

This article describes the materials, the kind of equipment handling them, the dusts formed, and the mechanisms which give rise to them in a modern fertilizer factory. Attempts were made to modify the manufacturing processes for granular products to reduce dust formation, and a method of measuring the dustiness of granules was evolved. Such variables as particle size, raw material source, effect of recycle ratio, drying temperature, and the effect of additives were examined, only the last proved to be effective, the most successful agent was a heavy cylinder oil which had no effect on the belt conveyor. The apparatus for its application is described.

-- APCA Absts.

451 Experimental Effect in Guinea Pigs of Ingestion and Repeated Inhalation of Copper Dust (Preliminary Report). P. Dervillee, et al.

Arch. maladies profess. 23, 598-600 (Sept. 1962). French.

Copper powder may form 82%-98% of bronze paints and metallic paints with Zn, Pb and As, for lithography and printing. Symptoms have been reported from absorption of copper dust by cutters, filers and polishers in work with dyamo plates and electric motors. Pulverized copper (99.6% Cu) was used in 3 experiments of 4 or 5 guinea pigs. Blood changes are described and histological findings will be reported later. When given by mouth daily, a dose of 1.5 g. per kg. was lethal in 60-88 days. After initial gain much weight was lost. Pre-terminal prostration was marked but there were no convulsions or paralysis except that the longest survivor had hindleg paralysis temporarily after aborting on the 20th day. All guinea pigs had peritoneal effusion; the gastric and intestinal mucosa was discolored in patches but there was no bleeding or ulceration. A group, in which ingestion of deposited powder was not prevented, inhaled the powder (which was delivered at the rate of 2.5 g. per minute) for 10 minutes daily. They died in 10-15 days. Cataract occurred in 2 animals after 3 days. All lost weight and had prostration, photophobia, salivation, dyspnea, oliguria and abdominal distension. The lungs were exsanguinated, the alimentary tract was dilated but not particularly discolored and there was peritoneal effusion. Another group, in which ingestion was prevented, underwent similar inhalations, with no visible effects during the 60 days of the experiment. X-ray examination of the chest was normal. One animal died at the first inhalation (lung infarct) and another died during collection of blood under anesthesia on the 40th day. At this time, electrophoresis in others showed increase in alpha-1 globulins, the peak reaching the level of the sero-albumins; there was no increase in alpha-2 globulins.

-- Bull. Hyg.

- 452 The Measurement of the Resistivity of Power Station Flue Dust. L. Cohen and R. W. Dickinson. J. Sci. Instr. 40, 72-75 (Feb. 1963).

The difficulties in obtaining realistic values of the resistivity of power station flue dust are outlined. The principle of operation of the site apparatus described is to sample the dust laden flue gases by a suction probe and to extract the dust in a small, high efficiency, cyclone. The results obtained show that the resistivity of flue dust undergoes a rapid change with time after its removal from the flue gas stream. Measurements of dust resistivity in the laboratory can be misleading and only the values measured on site should be considered for design purposes.

-- APCA Absts.

- 453 A Simple Method of Studying the Behaviour of Dust Particles Flowing Past Obstacles. W. Walkenhorst. Staub 22, 255-259 (July 1962). German.

A laminar stream of dusty air is drawn down a verticle tube having an internal diameter of 1.5 cm. The air flows through a membrane filter which covers the lower end of the tube. If an obstacle such as a wire gauze is placed in the tube a shadow pattern, produced by dust stain, develops on the upper surface of the filter. Ordinary filter papers do not give sharp patterns; only membrane filters are satisfactory. This method makes it possible to demonstrate clearly convection patterns and the dust-free space round heated obstacles. Dust-free spaces due to evaporation of alcohol could also be shown.

-- Bull. Hyg.

- 454 New Way to Sample Industrial Gas Streams. E. A. Wolfe. Air Eng. 4, 24-29 (Dec. 1962).

To determine the amount of particulate matter in an industrial gas stream for purposes of determining dust loading, design of a dust collector system, etc., the most important single piece of apparatus is the filter medium. The filter media used today for gas stream testing have, however, various drawbacks, and it is the purpose of this article to review the problems associated with the use of these filters and to outline the use of a new type of filter that largely eliminates these problems.

-- Author's summary

- 455 A New Tool for Air Pollution Control: The Aerosol Particle Counter. W. R. Zinky. J. Air Poll. Control Assn. 12, 578-583 (Dec. 1962).

Air pollution control now includes workers in many scientific disciplines. In the fields of medicine, space instrumentation, industrial hygiene, environmental control, chemical warfare, and urban air pollution control, there is a common requirement for better instrumentation and labor saving devices to analyze the contents of the air and other gases. Some of the parameters that are of particular interest in each of these fields are enumerated.

-- Public Health Eng. Absts.

- 456 Airborne Dust in Foundries. R. Schardt. Zentr. Arbeitsmed. u. Arbeitsschutz 12, 157-161 (July 1962). German.

Mechanization of the larger iron foundries has resulted in greater productivity and a corresponding increase in dust in spite of the employment of various methods of dust suppression. A series of measurements of dust concentration, with a konimeter-HS, revealed concentrations of dust far above the accepted maximum allowable values; in general, only about 5% of the particles counted were larger than 5 microns so that most of the dust measured represented a genuine respiratory hazard. Modern, well-planned plants were the worst offenders in this respect. Local exhaust, enclosure and special attention to troublesome sources of dust, such as sand-blasting and conveyors, are given as likely targets for new steps in dust suppression.

-- Bull. Hyg.

- 457 Byssinosis in a Cotton Weaving Mill. A. Bouhuys.
Arch. Environmental Health 6, 465-468 (Apr. 1963).

Symptoms of byssinosis were found in 19 of 22 workers employed in weaving heavy cloth made of unsized yarns. Forced expiratory volume decreased significantly on Monday but not on Wednesday in 17 weavers. Adequate dust control measures should be taken in weaving mills manufacturing this type of cloth. In addition, Monday-dyspnea may be relieved by inhalation of isoproterenol.

-- Author's summary

- 458 Serum Protein Fractions in Rheumatoid Pneumoconiosis without Arthritis. R. B. Payne.
J. Clin. Pathol. 15, 475-477 (Sept. 1962).

Rheumatoid pneumoconiosis may occur in the absence of arthritis, and positive rheumatoid factor tests have been found in a significant number of miners thus affected. The author has studied the serum protein fractions by means of electrophoresis, together with the sensitized sheep cell agglutination test, the bovine gamma globulin latex fixation test and the RA test, in 14 coal miners without arthritis but with chest radiograph opacities characteristic of rheumatoid pneumoconiosis. These were matched with 14 subjects each having Caplan's syndrome or progressive massive fibrosis or simple coal worker's pneumoconiosis, and also with 6 healthy non-miners. The results for the 62 men are shown in two tables. The last 3 tests were positive only in those with rheumatoid pneumoconiosis, and the percentages varied between 50 and 79 in those without arthritis to 86 in those with arthritis. In the electrophoretic tests, those with opacities typical of rheumatoid pneumoconiosis but without arthritis showed a reduction in the albumin level and an increase in alpha-2 and gamma globulin compared with levels in miners with simple coal worker's pneumoconiosis and in normal subjects. The changes were smaller than those found in miners with Caplan's syndrome and did not differ significantly from those found in miners with progressive massive fibrosis, but without arthritis. It would seem that estimation of serum protein fractions is unlikely to be helpful in the differential diagnosis of unusual opacities seen in chest radiographs of miners without arthritis.

-- Bull. Hyg.

- 459 Considerations on the Pneumoconiosis of Iron Miners. P. Casanouve and G. B. Soudan.
J. franc., Med. et Chir. Thorac. 16, 21-28 (1962).

From a statistical and clinical study of the cases of pneumoconiosis encountered among the iron miners of the Briey Basin, it is concluded that siderosis is of frequent occurrence and may sometimes be associated with silicosis. In its pure form, it is characterized by the moderate nature of the signs of respiratory insufficiency, which are accompanied by a radiological picture of the reticular or micronodular type, especially of the nodular or pseudotumoral type. Its gravity lies in its early repercussion on the right cavities of the heart, which should be detected before the stage of right ventricular insufficiency on the basis of clinical and ECG premonitory signs. Therefore, the role of the specialist should be to diagnose the cardiac involvement by having recourse, if necessary, to oxymetry and to catheterization. Spirometric tests have only a relative value for the assessment of the exact degree of incapacity. The latter should be evaluated as a function of the condition of the heart.

-- Public Health Eng. Absts.

- 460 The Conflict of Living Matter with the Mineral World: The Pneumoconioses. A. Policard.
J. Clin. Pathol. 15, 394-400 (Sept. 1962).

This research has been directed to the action of industrial mineral dusts on phagocytic cells and their capacity to bring about the production of fibrogenic toxic products. Two methods are in use. In the first, macrophages obtained after injection of dusts into the peritoneal cavity of rats have been examined *in vivo*. The method of obtaining a phase-contrast film is given and the results obtained from a study of these films show that the dust is phagocytosed by histocytes, not by polynuclear cells. The changes vary according to the dust. With inert dusts no effect is produced on the cells except that when particles are numerous movement is slowed. With quartz the activity of the macrophages is much diminished and internal movements of cytoplasm may be suppressed. With calcite and some other dusts, the particles are contained in the vacuoles or near them. The second method is examination with the electron microscope of changes in the ultra-structure of the cell produced by the presence of dust. Coal dust, hematite dust, titanium

dust and kieselguhr dust produce no appreciable injurious action on the protoplasmic structure. Some minerals such as certain varieties of silica have a coagulating action on the protoplasm. A mass of particles may be surrounded by a cloud of coagulated protoplasm, not clearly defined. When fragments of cells containing silica are phagocytosed, the cloud has a membrane. Calcite particles are contained in large vacuoles. Mica produces vacuolation but the particles lie outside the vacuoles. Further investigation is indicated into the capacity of the liberated waste of cellular proteolysis to provoke fibrosis. Investigation of the effects of mixed dusts is now being pursued.

-- Cond. from Bull. Hyg.

- 461 The Investigation of Anti-Lung Antibodies in Silicosis. E. Kalman, A. Mandi and M. Osztovcics. Med. lavoro 53, 165-169 (Mar. 1962).

The authors have investigated the presence of anti-lung antibodies in the sera of 40 patients, in different stages of silicosis. Steffen's anti-human globulin consumption test has proved to be suitable for the demonstration of anti-lung antibodies. The authors have succeeded in demonstrating anti-lung antibodies in 82.5% of the silicotic sera investigated. It has been stated by the authors that these antibodies, isolated from the sera of silicotic patients by means of immunoelectrophoretic methods, have proved to be gamma- and beta-globulins. The latex fixation test was negative on the sera of silicotic patients.

-- APCA Absts.

- 462 Physiological Reactions of the Respiratory System Under the Influence of Dusts in Patients Suffering from Silicosis. B. Barhad and L. Petrescu. Arch. maladies profess. 23, 230-239 (1962).

A study was made of the phenomenon of diminution of respiratory amplitude when a subject passes from respiration in pure air to respiration in dust-containing air. It was found that, in parallel with the progression of the silicotic process toward more advanced stages, this phenomenon becomes more stable. This alteration is very constant and significant in patients suffering from third degree silicosis and controls. Another constant phenomenon is the increase in respiratory amplitude in silicotic patients as compared with controls. In the latter, the value of the ratio between duration of expiration and that of inspiration, when a subject passes from respiration in pure air to respiration in dust-containing air, presents a very distinct increase. In silicotics, this phenomenon, although present, is not stable and often even inverse reactions may be found.

-- Public Health Eng. Absts.

- 463 Experimental Production of Mesothelial Tumours of the Pleura by Implantation of Dusts in Laboratory Animals. J. C. Wagner. Nature 196, 180-181 (Oct. 13, 1962).

To find out if mesotheliomas can be produced experimentally, various forms of asbestos dust were injected into the pleural cavities of animals. Samples of the dusts of crocidolite, chrysotile and amosite were used along with those of silica and of carbon black as controls. Chemical analysis of these dusts showed that oils and 3,4-benzpyrene were found in crocidolite dust but only to a slight extent in amosite dust and not at all in the other dusts. In this investigation, 106 rats had died from various causes or were killed within 30 months after injection. Four developed mesothelioma, 7 adenoma of the breast and 8 reticulum-cell sarcoma. Adenoma of the breast and reticulum-cell sarcoma occur naturally in laboratory animals; mesotheliomas do not occur in the strain of rat used. Two of the rats exposed to crocidolite dust, one exposed to chrysotile dust and one to silica dust developed mesotheliomas. A further rat, dusted with chrysotile in another experiment was found to have mesothelioma. These tumors were histologically similar to those found in human patients and they showed also the presence of hyaluronic acid. The occurrence of mesotheliomas after injection with chrysotile and silica dusts has yet to be explained. The author is continuing his investigations of the association between mesothelioma and asbestos dust.

-- Bull. Hyg.

- 464 Inhibiting Effect of Ultraviolet Light on the Development of Silicosis in Experimental Animals.
Z. D. Gorkin, G. I. Evtushenko and I. S. Ostrovskaja.
Gigiena i Sanit. 27, 20-25 (Oct. 1962).

The authors studied the action of various doses of ultraviolet radiations on the development of the silicotic process in experimental white rats. The effectivity was assessed by the data of pathomorphological examinations of the lungs of the animals sacrificed 6, 9, and 12 months after the beginning of the experiment and by certain other indexes. In one series of experiments the absolute collagen content of lung tissues was determined. Besides, the phagocytic activity of neutrophilic leukocytes against *Staphylococcus aureus* was investigated. It was determined that ultraviolet radiations in suberythmic and small erythmic doses inhibit the development of sclerotic lesions in the lungs produced by quartz dust. -- APCA Absts.

- 465 The Problem of Dimensions of Miniature Chest X-Ray Films. C. Garavaglia.
Med. lavoro 53, 170-178 (Mar. 1962). Italian.

The author studied 10 cm. and 7 cm. miniature x-ray films, from the point of view of recognition of detail (by densitometric analysis) and of diagnostic value (by comparative examinations), and then compared the above to radiographs. As a diagnostic test he used the radiological picture of simple pneumoconiosis, subdivided into categories according to the International Classification. The conclusion reached as the result of the study, was that the optimal dimension for miniature x-ray pictures was roughly 10 cm. -- APCA Absts.

- 466 A Case of Pseudo-Tumoural Silicosis. A. Grieco and E. Sartorelli.
Med. lavoro 53, 359-370 (May 1962). Italian.

This paper, illustrated with radiographs, describes the case of a man aged 45 years who had been dry-drilling tunnels for 20 years; the free silica ranged from 35% to 50%. In addition to punctiform fibrosis, chest x-ray examination showed an opacity 5 cm. in diameter in the right lower lobe. It was sclerotic, rich in anthracotic pigment and did not resemble the histological picture of tuberculosis or Caplan's syndrome. The ashed residue contained 6% quartz. Resection of the affected lobe was carried out, but the patient subsequently developed a pleural effusion and tuberculous cavities in the left lung, from which he died. The authors consider the case to be one of silicotuberculosis in which the nodular mass was a tuberculosis lesion immunologically enhanced by silicosis; it is considered that the secondary cavity formation was caused by ischemic necrosis. -- Bull. Hyg.

- 467 Silica Powders of Respirable Size. II. Dissolution Rates in Dilute Hydrofluoric Acid.
I. Bergman. J. Appl. Chem. (London) 12, 336-341 (Aug. 1962).

As part of fundamental studies in silicosis research, the rates of dissolution in 0.1 M-hydrofluoric acid of size-graded powders of quartz, tridymite, cristobalite and vitreous silica, having particle diameters in the range 0.2 - 5.0 microns have been measured by a conductimetric micromethod. The rates of dissolution per unit area of the vitreous silica powders were an order of magnitude larger than those of the tridymite or cristobalite powders, and two orders of magnitude larger than those of the quartz powders. Quartz, unlike the other polymorphic forms of silica, showed an increase in rate (per unit area) with decreasing particle size as well as an increase in the relative amount of "easily soluble layer". These results are adduced as evidence against the "solubility theory of silicosis" and in favor of a biological activity dependent on the surface structure. -- Bull. Hyg.

- 468 Asbestosis and Tuberculosis—A New Aspect of the Compensation Liability.
H. Bohlig, G. Jacob and H. Muller.
Intern. Arch. Gewerbepathol. Gewerbehyg. 19, 434-449 (1962). German.

In both West and East Germany regulations provide for compensation for victims of silicosis and silicosis accompanied by tuberculosis. There is also provision for asbestosis victims but not where asbestosis is accompanied by tuberculosis. This position has not been

changed because of the conclusions drawn by Wedler (*Lungentuberkulose bei Asbestose*, 1947, Leipsiz: Barth) but in later years he has modified his opinion. The authors have, therefore, gone into the question anew and have accumulated a large number of cases. The particular conclusion of Wedler to be checked was that the accompanying tuberculosis ran a relatively favorable course independent of the degree of asbestosis and that it played no part in the occurrence and termination of an asbestosis. Up to the end of 1961, in the 613 known asbestosis patients, 40 of them had active tuberculosis, a proportion of 6.52%. Half of the 40 patients with the combined disease had died, 7 of tuberculosis. The total deaths in the 613 cases numbered 89. Tuberculosis was the fourth most frequent cause of death, after right heart failure, pulmonary carcinoma and carcinoma of other sites. The tuberculosis morbidity of asbestosis patients is higher than is generally admitted in Germany, but not significantly higher than that of the comparable age-groups of the rest of the population. An illustrative case of the combined disease is described. Treatment, including chemotherapy was not successful, and in this patient a mutually harmful influence was exerted by the two diseases. The authors press for this fact to be taken into consideration in individual compensation cases in Germany more than it has up to now.

-- Bull. Hyg.

- 469 Comparison of Pneumoconiosis-Producing Properties of Silicon Structureless and Crystalline Asbestos Dust. K. Szymczykiwicz and E. Wiecek. *Med. Pracy (Lodz)* 13, 85-97 (1962). Polish.

An amount of 40 mg. of silicon dust, structureless asbestos dust, and crystalline asbestos dust was introduced during ether anesthesia into the prepared trachea of guinea pigs divided into 3 groups (16 guinea pigs in each group). A different kind of dust was given to each group in 2 ml. of normal saline solution. The contents of colagene in the lungs as well as the SiO_2 in blood and lungs was estimated every 2 months. The lungs were subjected to histopathological examination. It was found that the pneumoconiosis-producing properties of the structureless asbestos are less than those of the crystalline asbestos as compared with the biological effect of the silicon dust.

-- Public Health Eng. Absts.

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 470 The Physiological Adaptations to Heat-Stress with a Classification of Heat Illness and a Description of the Features of Heat Exhaustion. B. A. King and M. E. Barry. *S. African Med. J.* 36, 451-455 (June 9, 1962).

Africans engaged in deep-level mining in the Orange Free State are working hard in hot and humid conditions. Air dry bulb temperatures vary from 86 to 96°F, with a relative humidity of 90 to 96%. Adequate replacement of fluid and electrolytes lost in sweat, maintenance of a steady work rate, and repeated checks on body temperature and physical stress by trained supervisors, keep down the incidence of heat illness. The heat disorders commonly encountered include heatstroke, heat hyperpyrexia, heat cramps and salt-depletion heat exhaustion, and prickly heat. The authors review briefly the whole question of acclimatization to heat and of heat illness, then proceed to consider the clinical features of salt-depletion heat exhaustion. They draw from their own experience and from the bedside and laboratory findings in their last dozen or so cases of salt depletion. These patients suffered weakness, apathy, nausea and vomiting, dizziness, and muscle cramps; they were found in general to have the signs of dehydration, orthostatic tachycardia and syncope, a low oral temperature, hemoconcentration, a high blood urea, low serum and urine chlorides, and oliguria. Intravenous therapy was aimed at replacing approximately 5 liters of fluid and 25 g. of salt, and normal saline was used for the first 2 liters. The prognosis of the disorder is good.

-- Bull. Hyg.

- 471 Heatstroke. M. E. Barry and B. A. King.
S. African Med. J. 36, 455-461 (June 9, 1962).

During the past 7 years, 97 Africans have suffered heatstroke in the deep-level gold mines of the Orange Free State. Twelve have died. In the authors' experience, the risk of heatstroke begins when the wet bulb temperature exceeds 84°F. The main etiological factor, apart from the environment, was hard work. Most of the casualties occurred in workmen who were regarded as being acclimatized to the conditions. The clinical features which were observed reiterate the best descriptions of heatstroke: disorientation and aggressive behavior followed almost immediately by collapse and unconsciousness, a hot dry skin, high body temperature, coma, incontinence of watery feces, rapid pulse and respiration, and coarse tremors. Laboratory findings included neutrophil leucocytosis, low blood carbon dioxide content, a moderate rise in blood urea, and proteinuria with granular casts. Rare abnormalities included jaundice and renal failure. In fatal cases there were petechiae and chromatolysis of the neurones of the cerebellum and cerebral cortex. Patients who recovered had retrograde amnesia. Cooling was achieved by ice packs and bathing the skin with ice water in some patients, and by the Guthrie and McCracken method in others. Chlorpromazine was given intravenously to prevent shivering, and pressor agents were used to combat shock. -- Cond. from Bull. Hyg.

- 472 The Practical Assessment and Control of Industrial Noise. H. J. Purkis.
Sanitarian (London) 71, 211-217, 221 (Dec. 1962).

This paper describes a comparatively simple procedure for noise assessment, using measurements made with a sound level meter, which may prove accurate enough to give guidance in such cases. Since remedial measures are often necessary, the paper also describes some of the principles of sound insulation and absorption used in noise control.

-- Public Health Eng. Absts.

RADIOACTIVITY AND X-RADIATION

- 473 Cancer Therapy: Evaluation of Supervoltage X-Ray—A Review of the Literature. L. G. Jacobs.
Calif. Med. 97, 163-165 (Sept. 1962).

Statistical evidence that indicates that cure rates achieved by supervoltage are not significantly different from those achieved by orthovoltage in carcinoma of the tonsil and ovary is presented. The higher depth dose of supervoltage therapy may produce severe damage to structures about the tumor, and the assumption that a greater number of cures will result because of dose increase must be balanced against the well documented fact that severe damage to the tumor bed lessens rather than increases the proportion of cures. To evaluate the relative benefits, two forms of cancer were selected for review. Cancer of the tonsil was chosen as an example of a relatively accessible tumor and cancer of the ovary as a deep seated tumor. A list was made of the number of cases treated, the number of 5-year survivals, and the voltage range. The survey showed that the increased cost of supervoltage is not associated with better cure rates.

-- Nuclear Sci. Absts.

- 474 An Installation to Avoid Direct Radiation Hazards in X-Ray Analysis. W. Hughes.
J. Sci. Instr. 39, 564-565 (Nov. 1962).

The International Commission for Radiological Protection has made recommendations which would give greater protection against accidental exposure to radiation in installations used for x-ray analysis. A system which embodies these recommendations has been developed and put into operation in this laboratory. It is based on the principle that, unless the x-ray tube ports are either closed or have a goniometer in position in the x-ray beam, x-rays cannot be produced.

-- Public Health Eng. Absts.

- 475 Acute Accidental Superficial X-Ray Burns: An Interim Report on 11 Cases. R. D. Sweet.
Brit. J. Dermatol. 74, 392 (Nov. 1962).

A soft x-ray unit was incorrectly operated over a 6-day period with the result that 11 patients who should have received treatment with grenz rays generated at 10 kv. received, instead, x-rays generated at 50 kv. through a 0.05 mm. aluminum filter for a time appropriate for the delivery on the skin surface of 100 r. at 10 kv. The focus-skin distance (FSD) in 10 of the cases was 14.2 cm. One patient who was irradiated at a FSD of 20 cm. received a surface dose of 5,850 r. The reactions resulting in this patient were similar to those in the others. All patients had some form of chronic eczema, mostly of the hands and fingers. About 3 weeks after irradiation all treated areas were almost identically devastated. Between the 6th and 8th days the deepening erythema became tender to the touch and within a few hours spontaneously painful. The pain rapidly increased in severity during the next 2 or 3 days and it could not be modified by local applications including hydrocortisone, until the surface broke down. Swelling commenced soon after the area became acutely painful. Rings worn on the fingers had to be cut off. The first signs of healing were detected at the edges of the burnt areas by about the 21st day. Fingers and palms continued to heal at a steady rate, but not the backs of hands; here grafting of small areas will probably become necessary. The complete lack of the production of granulation tissue by the burnt dermis resulted in progressive slowing in the rate of healing the farther new epidermis had to grow from the edge of the burnt area. The considerable leukocytosis seemed dependent on dermal inflammation rather than on epidermal destruction. Treatment with large doses of prednisolone may have lessened pain and helped maintain function.

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

- 476 Radioactive Luminous Material Hazard. R. D. Clubb and T. J. Iltis.
Bur. Ships J. 12, 36 (Jan. 1963). (Bureau of Ships Journal*).
AVAILABLE FROM: U.S. Navy Department, Superintendent of Documents, Washington 25, D.C.
PRICE: \$1.75.

Direct radiation of radioactive luminescent material is usually minor, but radioactive particles can be a serious radiation hazard if taken into the body. Less than 1/100th of the strontium-90 in one type of marker represents the lifetime body limit for this isotope. Damaged or deteriorated luminescent markers or equipment can contaminate local areas with radioactive particles which can circulate in the air or be picked up on the hands or clothing of personnel. Whenever airborne radioactive particles are present, ventilation filters and electrostatic precipitators will collect and concentrate the particles and become radiological hazards themselves. Radium markers, even those without damage, can cause a build-up of airborne particles in the closed atmosphere of submarines through release of the gaseous decay product, radon. Safety precautions are discussed.

-- APCA Absts.

- 477 The Ingestion of Radium 226 in Food and Water in Great Britain. R. C. Turner.
Brit. J. Cancer 16, 200-208 (June 1962).

The author has made an elaborate study of how radium-226 gets into the body. It does so mainly by the food ingested and to a much lesser extent by the water drunk. The mean values, as measured by alpha-ray activity, are given as micromicrocuries per 100 g. weight; oatmeal and breakfast cereals head the list. The author investigated these contents among different social groups—professional, intermediate occupations, skilled, partly skilled and unskilled occupations. Throughout the entire range of these groups there was little variation, a result attributable to the large contribution of the total food taken by the high activity cereal foods. Turning to the radium content of water the author examined water from widely differing sources all over the country. The highest natural activity is shown in the water supplies of Cornwall, and otherwise it is found that the alpha-activity is broadly related to the mineral content of the water. Surveying the data as a whole it was found that the mean intake of radium-226 from food is remarkably constant at a value between 2 and 3 micromicrocuries per day per person, the cereal type foods contributing 60 - 70%. The mean daily intake from water represents only 5 - 6% of this; the one exception being Cornwall.

-- Bull. Hyg.

* Address not in current List of Periodicals.

- 478 An Evaluation of the Health Physics Problems from Thorium and Its Daughters in a Thorium Purification and Fabrication Process. C. M. West.
Health Physics 8, 279-297 (June 1962).

Evaluation of the health physics problems associated with thorium processing is complicated by the presence of the short-lived daughters of the decay chain. Direct radiation measurements and film meters were used to evaluate exposures to penetrating radiation. Measurements made during exploratory thorium purification and fabrication processes include direct counting, alpha- and gamma-spectrometry, and *in vivo* counting. Data illustrating and defining the daughter complications are reported. These data indicate that, in many cases, over 90% of the alpha activity noted by conventional counting techniques is due to the daughter elements. A realistic evaluation of radiological hazards associated with thorium processing should include isotope identification techniques as well as screening by direct radiological counting.

-- APCA Absts.

- 479 Roentgen Diagnosis and Incidence of Leukemia. G. Neumann.
Deut. med. Wochschr. 87, 90-94 (Jan. 12, 1962).

From 1954 to 1960, 10 fatal cases of leukemia were recorded in Stuttgart among tuberculous patients over 14 years of age, in a sample equivalent to 91,549 person-year. In contrast to these 10 cases, 5.86 cases of fatal leukemia were recorded in a corresponding sample of the general population of Stuttgart in the same period, or 233 cases in the total population. Leukemia in the tuberculous patients who were presumably exposed to more frequent chest roentgenography than control subjects, was one case of the chronic myeloid type, 4 of the acute myeloid type, and 5 of the lymphoid type. Only 2 cases were under 50 years of age and the sex distribution was 5:5. In none of the 10 cases was radiation exposure excessive, in fact, case records showed that their exposure was slightly lower than for the whole sample of tuberculous subjects. In view of this fact and because the incidence of leukemia is not statistically significantly greater in these subjects than in the general population, thoracic diagnostic radiography did not appear to favor development of leukemia in these subjects.

-- Nuclear Sci. Absts.

- 480 Radioactivity of Water. E. W. Taylor. Chem. Ind. (London) 1229 (July 7, 1962).
(Chemistry & Industry (London), Society of Chemical Industry, 14 Belgrave Square, London SW1*).

The significance of radioactivity, both natural and man-made, is discussed in relation to drinking water supplies in Britain. Regular examination of the major surface drinking water supplies of Great Britain and Northern Ireland revealed that water contributes only a very small proportion of human daily ingestion of Sr-90. Monitoring for total beta activity was carried out by many water works and although this gave no indication of the individual radionuclides present, it gave prompt information of the general level of activity and whether or not pollution occurs from discharge of radioactive substances into a water course. The data obtained indicate that man's activities have had no significant effect on the general level of radioactivity of Great Britain's drinking water supplies.

-- Nuclear Sci. Absts.

ENVIRONMENTAL MEASUREMENTS

- 481 Estimation of the Density of Smoke in the Air. D. Rondia.
Intern. J. Air and Water Poll. 6, 353-375 (Sept.-Oct. 1962). French.

Three routine methods of estimation of a smoke sample, collected by filtration through fibrous media are described. The standard error is calculated and the results compared. A statistical computation of the differences, according to seasons and sampling sites, points to the

* Address not in current List of Periodicals.

influence of numerous factors responsible for the amplitude of the error in each method. The reflectometric method shows less variability but it is recommended to complete the quantitative estimation of suspended particulate matter with another determination of a more qualitative character.

-- APCA Absts.

- 482 Measurement of Diesel Engine Emissions. H. C. McKee, J. M. Clark and R. J. Wheeler. J. Air Poll. Control Assn. 12, 516-521, 546 (Nov. 1962).

Experiments were made to obtain the approximate level of atmospheric emissions from diesel engines and to evaluate some of the advantages and limitations of the different analytical methods available. Tests were made on several engines to determine the concentration of hydrocarbons in the exhaust and blowby streams. In diesel engine exhaust and blowby the hydrocarbon concentration is very low compared to that from conventional automobile engines. The values for ethylene and acetylene indicate that the light hydrocarbon gases may constitute a larger proportion of the total hydrocarbon constituents than with automobile exhaust. The flame ionization detector gives the best results as it measures total hydrocarbon content and is better suited to continuous operation at low concentrations. Condensation of hydrocarbons in the sampling system may represent a source of error in measuring diesel exhaust emissions. Dilution with hot nitrogen does not prevent this loss, although better results might be obtained if the diluted stream could be maintained at an elevated temperature through the flame ionization detector or other type of instrument.

-- Cond. from APCA Absts.

- 483 Engineering the Chronic Exposure of Animals to Laboratory-Produced Automobile Exhaust. R. G. Hinners. J. Air Poll. Control Assn. 12, 527-530 (Nov. 1962).

The laboratory facility was established to initiate studies utilizing automobile emissions tailored to simulate realistically the conditions and daily changes of city air. An automobile engine is coupled to a dynamometer unit designed to produce exhaust and blowby according to an established "driving" pattern. The emissions are proportionally diluted with cleaned conditioned air and fed to 4 dynamic flow irradiation chambers. Four separate sets of conditions are maintained in the chambers, the variables of concentration, rate of flow, duration and intensity of light being subject to decision. These atmospheres are monitored with continuous recording instruments for CO, NO, NO₂, hydrocarbons, and ozone on a rotational schedule.

-- Public Health Eng. Absts.

- 484 Source and Atmospheric Analyses for Formaldehyde by Chromotropic Acid Procedures. A. P. Altshuller, L. J. Leng and A. F. Wartburg. Intern. J. Air and Water Poll. 6, 381-385 (Sept.-Oct. 1962).

In investigations of pilot plant experimental and municipal incinerators, sampling for formaldehyde was done by both the acid and aqueous procedures. The results are discussed on the use of aqueous and acid collection procedures to synthetic vapor mixtures of formalin in air, incinerator effluents, auto exhaust, diesel exhaust, synthetic smogs, and urban atmospheres. The acid collection procedure is satisfactory for use in determining formaldehyde in auto exhaust. Analysis of raw auto exhaust has also been discussed. The chromotropic acid in sulfuric acid procedure should not be used in analyzing for formaldehyde in raw auto exhaust.

-- APCA Absts.

PREVENTIVE ENGINEERING

- 485 How to Handle Ventilation for Benzene Control. H. Bavley and L. D. Pagnotto. Air Eng. 4, 18-22, 29, 50 (Dec. 1962).

In rubber coating plants utilizing petroleum naphthas containing 3% by weight or less benzene content, general ventilation as specified may be relied upon to keep the work room

atmospheric contamination below the maximum allowable, provided adequate uncontaminated make-up air is supplied. For plants utilizing solvents with more than 3% benzene content, local exhaust ventilation should be relied upon for control of the solvent vapors. Ventilation specifications have been included for the control of solvent vapors resulting from the churning, saturating, and coating operations.

-- Public Health Eng. Absts.

COMMUNITY AIR HYGIENE

- 486 A Study of Air Pollution by Analysis of Particulate Material Collected from Air Filtration Plants. II. Determination of Polycyclic Aromatic Hydrocarbons in Total Air Solids.

A. J. Lindsay and J. R. Stanbury.

Intern. J. Air and Water Poll. 6, 387-390 (Sept.-Oct. 1962).

The polycyclic aromatic hydrocarbons; pyrene, fluoranthene, 1,2-benzpyrene, 3,4-benzpyrene, perylene, 1,2-benzperylene, anthanthrene have been determined in air solids collected at 2-week intervals throughout the year from an air filtration plant. The methods employed were extraction with cyclohexane followed by alumina column chromatography and ultraviolet spectrophotometry. The amounts varied in the well-known yearly cycle for combustion pollution. The yearly average figures expressed as percentage of the total air solids were 0.012 for the 7 hydrocarbons and 0.0014 for 3,4-benzpyrene and these were contained in soluble organic matter amounting to 4 - 5%. The nature of this material is as yet unknown. In the large amount of almost entirely uninvestigated material there may be quantities of other compounds with biological activities.

-- APCA Absts.

- 487 Problems in Smoke Control Areas. P. D. Coates.
Smokeless Air (London) 32, 260-263 (1962).

One of the problems in smoke control areas is that the majority of spontaneous objections from individual house-holders who feel that other local forms of air pollution, such as railway smoke, diesel smoke, or industrial emissions should be taken care of before the domestic chimney. The Beaver Committee emphasized the importance of the domestic chimney as a source of smoke. Use of coke has been recommended in black areas because the present production of premium fuels is not sufficient to meet the demand for open fire fuel. Education of the public is needed to show that coke can give satisfactory results and there are no supply difficulties. There are minor problems and difficulties in setting up smoke control areas. -- APCA Absts.

- 488 A New Wet Process for Precipitating Fine Dust. J. Pallinger.
Staub 22, 270-275 (July 1, 1962). German.

Dust-laden gas is drawn into a venturi; a water spray is directed axially against the contracting inlet of the venturi so that the water droplets strike the curved walls and bounce off into the throat. The velocity of the gas and dust particles exceeds that of the water droplets in the contracting inlet but is less in the slowly expanding outlet tube. Graphs are given for pressure loss as a function of water flow but data on dust removal as a function of particle size are lacking. The system is in use in steel works using oxygen-lancing.

-- Bull. Hyg.

- 489 Diesel Smoke and Its Causes. J. M. Dickson-Simpson.
Smokeless Air (London) 32, 305-308 (1962).

Black smoke occurs when carbon particles are suspended in the exhaust from a diesel engine, and carbon results when there has been a shortage of oxygen in the combustion process. Exhaust usually classed as just visible contains only 4 mg. of carbon per cubic foot of gas. A

moderately black exhaust contains 18 mg. per cubic foot. Black smoke is caused by incomplete combustion in the engine cylinders. Factors which affect smoke are volatility, measure of ignition quality, and specific gravity. Fuel quality, additives, and other causes are discussed.

-- APCA Absts.

MANAGEMENT ASPECTS

- 490 Disability Absences of Workers After Heart Attacks. R. D. Ketchum.
Ind. Med. & Surg. 32, 131-134 (Apr. 1963).

The disability absence records of 20 office workers (18 males and 2 females) who resumed work for a total of 65.4 man years following myocardial infarction were reviewed. These subjects had 4.6 calendar days absence yearly compared with 8.02 days yearly for the entire office force, and 4.8 days per 100 working days for all male workers. The coronary group had an average of 0.81 disability absences yearly compared to 2.39 per year for all employees. Each absence averaged 5.59 days for the cardiac group and 3.35 days for all. Most absences were due to respiratory and gastrointestinal disease, with few because of cardiac complications. A review of the literature shows the findings of others indicate favorable disability records among post-coronary workers. Experience with disability absenteeism among office workers with healed myocardial infarctions did not differ significantly from that of all employees.

-- Author's summary

ACCIDENTS AND PREVENTION

- 491 Some Aspects of Human Behavior in Relation to Accident Morbidity and Mortality. C. M. Mooney.
Occ. Health Rev. (Ottawa) 15, 4-7 (1963).

From his study, the author concludes that there is little likelihood of achieving a substantial reduction of accidents by programs of an informational or admonitory nature aimed at the general public. Accident control is a responsibility of political, industrial, and social management, mainly achieved in 2 ways: (1) by drawing up and enforcing adequate and up-to-date safe-practice codes; (2) by applying scientific methods of systems analysis to current and projected operations in order to minimize human costs. Applied research facilities in fields like operational research, human engineering, industrial psychology, should be more or less freely available to the industrial and business community. Basic research is wanted to uncover those salient psychophysiological variables that make people more or less vulnerable to accidents.

-- Author's summary

MISCELLANEOUS

- 492 City-Company Teamwork will Lift Pollution Load. Anon. Chem. Eng. 69, 88-90 (Nov. 12, 1962).

A joint venture by the City of South Charleston, West Virginia, and Union Carbide Chemicals Company in a municipal-industrial waste treatment plant to reduce pollutant load entering Kanawha River is described. The article discusses reasons for the joint venture, scope of treatment problem, provisions for growth, type of feed, equipment, control, analog-simulation for design of continuous process, and secondary treatment methods.

-- Public Health Eng. Absts.

- 493 Chemical Industry Solids Disposal Problems. M. E. Chodak. Inst. Sewage Purif. J. Proc. Part 5, 431-438 (1962). (Institute of Sewage Purification, The Journal and Proceedings, 10 Cromwell Place, South Kensington, London SW7, England*).

The problems of production and disposal of sludges from an elemental phosphorus manufacturing plant are discussed. In defining the problems, the composition of the effluent and the development and operation of the treatment are explained. In developing the full scale plant a step by step procedure is described, beginning with an experimental small scale plant and ending with the final acceptance of a centrifuge-thickener set-up for dewatering the sludge. A comparison is made with a U.S. plant using the centrifuge-thickener set-up to dewater raw digested sewage sludge. The application of these advantages to certain processes in the chemical industry where the dewatering of sludges is necessary are given.

-- Public Health Eng. Absts.

- 494 Iron from Pickle Liquor. C. L. Mantell and L. G. Grenni. J. Water Pollution Control Fed. 34, 951-961 (Sept. 1962).

The problem of disposing of spent pickle liquor is explained. Possible electrolytic processes of recovering iron from this liquor using anion exchange permselective membranes are discussed. Cost data and results of considerable laboratory work are presented. The authors conclude that "electrolytic iron from pickle liquor cannot compete with lower cost melting stock, nor as powder could it find markets for the production from even a single large steel mill."

-- Public Health Eng. Absts.

- 495 Effects of Naturally Fluoridated Water on Dental Caries in Adults. H. R. Englander and D. A. Wallace. Public Health Repts. 77, 887-893 (Oct. 1962).

The present study comparing dental caries experience among adults of a city with naturally fluoridated water with similar group in a nearby fluoride-deficient city involved 896 white, continuous residents of Aurora, Illinois, and 935 similar residents of Rockford, Illinois. Aurora water supply contains 1.2 ppm fluorides, while Rockford has 0.1 ppm. Decayed, missing, or filled (DMF) tooth experience was 40% less, and the DMF tooth surface effected were 50% less among Aurorans. Differences might have been greater if a random sample had been examined, but all those having less than 10 teeth were excluded. There were about 7 times as many edentulous persons in Rockford as in Aurora. Additional evidence is provided showing that the low caries experience resulting from the use of fluoridated water persists throughout life.

-- Public Health Eng. Absts.

* Address not in current List of Periodicals.

INDEX

<u>Absenteeism, of cardiacs</u>	490	<u>Chlorogenic acid</u>	
<u>Accident(s), human behavior in</u>	491	allergen in plant substances	427
<u>Aerosol(s), particle counter</u>	455	<u>Cholinesterase measurement in blood</u>	418
<u>Air pollutant(s)</u>		<u>Chromate assimilation by trout</u>	437
polycyclic aromatic hydrocarbons	486	<u>Copper dust, effect on guinea pigs</u>	451
<u>Air pollution</u>		<u>Dermatitis, dermatosis(es)</u>	
causes of diesel smoke	489	betamethasone	426
control, problems in control areas	487	from hydrazine compounds	428
		neurodermatoses in industry	425
<u>Allergy(ies), chlorogenic acid</u>	427	<u>Dieldrin, health hazards from</u>	447
<u>Arthritis</u>		<u>Diésel</u>	
and rheumatoid pneumoconiosis	458	measurement of engine emissions	482
use of muscle relaxant	420	smoke and its causes	489
<u>Asbestos dust</u>		<u>Distomatosis in Belgium</u>	422
production of mesothelial tumors	463	<u>Drugs</u>	
pulmonary effect of crystalline and non-crystalline	469	evaluation in industrial medicine	413
<u>Asbestosis-Tuberculosis</u>		legal liability in testing new	407
compensation liability in Germany	468	<u>Dust(s), airborne in foundries</u>	456
<u>Bacteria, dispersal in hospital wards</u>	412	<u>Dust control, suppression</u>	
<u>Benzene control, ventilation for</u>	485	in a fertilizer plant	450
<u>Betamethasone, dermatological evaluation</u>	426	new wet process for	488
<u>Blood</u>		<u>Dust counting, determination</u>	
cholinesterase measurement	418	aerosol particle counter	455
coagulation and industrial intoxications	434	<u>Dust sampling, samplers</u>	
<u>Books</u>		dust flow past obstacles	453
the pneumoconioses	410	<u>Endrin, health hazards from</u>	447
silicosis in lead and zinc mine in Rajasthan	411	<u>Exhaust gases, automotive engines</u>	
<u>Brucellosis, in public health work</u>	423	exposure of animals to	483
<u>Burns, resistance to infection in patients</u>	429	measuring diesel emissions	482
<u>Byssinosis, in a cotton weaving mill</u>	457	<u>Eye, 1,000 contact lens cases</u>	417
<u>Cancer</u>		<u>Fertilizer plant, dust control in</u>	450
detection in low-income groups	421	<u>Filter(s), for sampling gas streams</u>	454
supervoltage x-ray therapy	473	<u>Flue dust, measurement of resistivity</u>	452
<u>Carbon tetrachloride</u>		<u>Fluoridation of water</u>	
acute intoxication	445	effects of natural fluoridated water on dental caries	495
effect on blood coagulation	434	<u>Fluoride(s), exposure to and worker health</u>	435
hazards from use in German railway	446	<u>Fly ash, measurement of resistivity</u>	452
<u>Carcinogens, polyoxyethylene(8)-stearate</u>	431	<u>Formaldehyde</u>	
<u>Cardiac(s), disability absences of</u>	490	source and atmospheric analyses for	484
<u>Cardiovascular lesions</u>			
from paraphenylenediamine dyes	444		

<u>Foundries, airborne dust in</u>	456	<u>Pneumoconiosis</u>	
<u>Gastrointestinal disease</u>		action of industrial dusts on phagocytic cell	460
and environment	419	copper dust	451
<u>Heat and humidity</u>		in iron miners	459
heatstroke in gold miners	471	production of mesothelial tumors	463
physiological adaptations to heat-stress	470	pulmonary effect of structureless asbestos	
<u>Hemolytic chemicals</u>		dust	469
hypersusceptibility test for	432	rheumatoid in coal miners	458
<u>Hydrazine derivatives, eczema from</u>	428	size of x-ray film for diagnosis	465
<u>Industrial health</u>		<u>Polyoxyethylene(8)-stearate as carcinogen</u>	431
methodology in studies of	414, 415	<u>Psychiatry</u>	
<u>Industrial medicine</u>		decisive thinking in emotional disorders	416
evaluation of drugs	413	<u>Radioactive hazards from luminous markers</u>	476
<u>Insecticide(s)</u>		<u>Radioactivity, in drinking water</u>	480
estimation in foods	449	<u>Radium hazards from markers on ships</u>	476
oral poisoning by parathion	448	<u>Radium-226, ingestion in food and water</u>	477
<u>Lead alkyls, acute effects of</u>	441	<u>Rheumatic diseases, use of muscle relaxant</u>	420
<u>Lead tetraethyl</u>		<u>Silica dissolution rates in hydrofluoric acid</u>	467
acute effects of	441	<u>Silicosis</u>	
toxicity	440	anti-lung antibodies in	461
<u>Lead tetramethyl</u>		effect of ultraviolet light	464
handling gasoline containing	439	in lead and zinc mine in Rajasthan	411
potential hazard of exposure to	438	<u>Silicotics, reactions under influence of dusts</u>	462
toxicity	440	<u>Silicotuberculosis in a tunnel worker</u>	466
<u>Legal liability</u>		<u>Smoke, estimation of density in air</u>	481
volunteers testing new drugs	407	<u>Snake bite observations on 125 cases</u>	424
<u>Leukemia, and roentgen diagnosis</u>	479	<u>Sodium chloride, pathology of acute poisoning</u>	436
<u>Mercury</u>		<u>Staphylococci, dispersal in hospital wards</u>	412
absorption and excretion in man	442	<u>Thorium, hazards in processing</u>	478
"Metal ague", from zinc galvanizing	443	<u>Toxicology</u>	
<u>Nitrogen tetroxide</u>		role of behavioral toxicity	433
exposure in missile industry	430	test for hemolytic chemicals	432
<u>Noise control and reduction</u>		<u>Ventilation for benzene control</u>	485
practical assessment of	472	<u>Viper bite, observations on 125 cases</u>	424
<u>Ophthalmology</u>		<u>Waste disposal</u>	
1,000 contact lens cases	417	city-company teamwork in	492
<u>Paraphenylenediamine dyes</u>		iron pickle liquor	494
cardiovascular lesions from	444	phosphorus manufacturing plant	493
<u>Parathion poisoning by oral route</u>	448	<u>Workmen's compensation</u>	
<u>Pesticides, health hazards from</u>	447	asbestosis-tuberculosis in Germany	468
<u>Pneumoconioses (bk. rev.)</u>	410	<u>X-ray(s)</u>	
		acute superficial burns	475
		in cancer therapy	473
		and incidence of leukemia	479
		protection against hazards of	474
		size of film for pneumoconiosis diagnosis	465
		<u>Zinc galvanizing hazards</u>	443