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Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL

OCTOBER, 1960

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INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE •• PITTSBURGH 13, PA.

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1935 SILVER ANNIVERSARY 1960

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INDUSTRIAL HYGIENE FEATURES

HHBB-0018641

Data on mass screening for tuberculosis and missed cases are presented in Abst. No. 952.

Information on the smoking patterns of Canadian university students is given in Abst. No. 956.

A report on the pathologic effects of smoking tobacco on the trachea and bronchial mucosa is the subject of Abst. No. 958.

See Abst. No. 963 for a discussion of rubber glove dermatitis.

Consult Abst. No. 965 for the management of extensive cutaneous burns.

Two years' experience in a Canadian poison control center is the theme of Abst. No. 966.

Information on an automatic hydrogen fluoride recorder for industrial hygiene and stack monitoring is given in Abst. No. 970.

Abst. No. 973 is concerned with a survey of results of investigations on some organic mercury compounds used as fungicides.

The toxicity of bromochloromethane is considered in Abst. No. 977.

Abst. No. 979 is concerned with a histogenetic study of chronic interstitial pneumonitis.

Hypertension due to inhaled submicron amorphous silica is the title of Abst. No. 980.

Factors to be considered regarding discharge electrodes and electrostatic precipitators are discussed in Abst. No. 985.

Is humidity important in the temperature comfort range? See Abst. No. 987.

The topic of Abst. No. 988 is trauma and vascular diseases arising from cold injury.

An account of the developments in the use of the A.I.S.I. automatic smoke sampler is presented in Abst. No. 1003.

For odor determination techniques for air pollution control consult Abst. No. 1008.

FOUNDATION FACTS

NEW MEMBERS OF I-H-F. The Foundation welcomes to membership:

Autometric Corporation
Van Straaten Chemical Company

SILVER ANNIVERSARY MEETING THIS MONTH. The immediate response to the invitations for our 25th Annual Meeting which will be held here at Mellon Institute, Pittsburgh, on October 26-27, has been most gratifying. We trust that every member company will be represented at these conferences and are confident that those in attendance will find the meeting both profitable and interesting.

TWO NEW REPRINTS. "Chronic Interstitial Pneumonitis. A Histogenetic Study", by Paul Gross. Arch. Pathol. 69, 706-715, (June 1960); and "The Pulmonary Response to Tuberculin", by Paul Gross, M.L. Westrick, and J. M. McNerney. Arch. Pathol. 70, 233-243 (August 1960). These reprints are available from the Foundation upon request.

03120619

TABLE OF CONTENTS

	<u>Page</u>
Industrial Hygiene Training Course	1.
News Items	1
Occupational Disease Statistics	3
Coming Events	3
Legal Developments	4
Books, Pamphlets and Notices	6
Industrial Medical Practice	8
Skin Diseases and Burns	11
Chemical Hazards	13
Industrial Dusts	17
Physical Aspects of the Environment	19
Radioactivity and X-Radiation	20
Environmental Measurements	23
Preventive Engineering	26
Community Air Hygiene	27
Management Aspects	31
Accidents and Prevention	32
Miscellaneous	34
Index	35

03120620

HWBB-0018642

INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

927 A New Division of Occupational Health.

The strengthening of the Public Health Service's nation-wide program to protect the health of American workers through the creation of a new Division of Occupational Health was announced recently by the Surgeon General. The new Division, which replaces the Occupational Health Program, follows the recommendation of the Study Group on Mission and Organization of the Public Health Service, designed to place greater emphasis on all types of environmental health hazards. It provides for "long-needed increased efforts" in the occupational health field as recommended to the Surgeon General by the Study Group. Dr. Harold J. Magnuson has been named chief of the new Division. The Division will carry out an expanded research program directed at developing better techniques, materials, and equipment for use in the prevention, diagnosis and treatment of occupational disease. Major research efforts will be intensified in toxicology and in related fields of clinical medicine, engineering, chemistry, and physics. In addition, the physiological and psychological factors in the work environment will come under more penetrating study. Greater emphasis will also be focused on the training of personnel in occupational medicine and nursing and in industrial hygiene to meet the needs of this rapidly growing field. The Division will work with academic institutions and other groups to help develop the necessary professional resources. Research and technical services, as well as training activities, will be carried out at Cincinnati, Ohio. State aid activities, occupational health nursing consultation, and studies and consultation relating to employee health programs will be centered at the Division's administrative headquarters in Washington, D. C.

928 Health Statistics Center.

A National Center for Health Statistics has been established in the Public Health Service. Initially, the center will have two Divisions: the U. S. National Health Survey, which was transferred to it on August 15; and the National Office of Vital Statistics, which will become part of the center on October 1. The Center's work will supplement but not supplant the statistical work associated with particular Public Health Service programs. Forrest E. Linder, who has been director of the National Health Survey since its inception in 1956, is acting director of the Center pending formal establishment of the position of director.

-- Science

929 Radiological Health Data.

The Department of Health, Education, and Welfare has announced the issuance of a new monthly technical publication giving levels of radioactivity in air, water, milk, and other elements of our daily environment. This publication is an outgrowth of President Eisenhower's directive to the Department to "intensify its radiological health efforts and have primary responsibility within the executive branch for the collation, analysis and interpretation of data on environmental radiation levels." Entitled Radiological Health Data, this publication is compiled from a number of sources by the Public Health Service's Division of Radiological Health with the assistance of a board of editorial advisers representing the Department of

03120622

Health, Education, and Welfare; Defense; Agriculture; and Commerce; and the Atomic Energy Commission. The first issue appeared in April 1960 and gives data on strontium-90 in milk collected at various places and times throughout the United States. Similarly reported are the radioactivity levels in air and water. The price of the publication is 50 cents per issue and \$3.00 for a 6-month subscription from the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

HARR-0018644

930 Course in Industrial Health for Nurses.

A full-time one-week course in industrial health for nurses will be given beginning October 31, 1960 by the Department of Industrial Medicine of New York University Post-Graduate Medical School, of the New York University Medical Center. Instruction consists of lectures and conferences led by both medical and nursing faculty of the Medical Center. A field trip of half a day will permit a visit to and a study of an industrial medical department in the Greater New York area. Subjects to be covered include: occupational health nursing as viewed by management, the physician and the nurse; the small plant problem; communications and supervision; individual and group behavior in an industrial setting; counselling and interview techniques; labor relations; preparation for retirement; problem clinic. Several sessions will be held jointly with industrial physicians enrolled in post-graduate study. Applications should be sent to the Dean, NYU Post-Graduate Medical School, 550 First Avenue, New York 16, N. Y. Tuition for the course is \$60.00.

931 American Thoracic Society—Annual Meeting.

The American Thoracic Society (formerly the American Trudeau Society), Medical Section of the National Tuberculosis Association, is soliciting abstracts of papers on all scientific aspects of tuberculosis and nontuberculous respiratory diseases for presentation at its annual meeting in Cincinnati, Ohio, May 22-24, 1961. Abstracts must be in the hands of the program committee not later than January 7, 1961. For further information write to Leon H. Schmidt, Ph.D., Chairman, Medical Sessions Committee, American Thoracic Society, 1790 Broadway, New York 19, N. Y.

932 Sulfur Chlorides.

Properties and essential information for the safe handling and use of sulfur chlorides are described in a new chemical safety data sheet published by the Manufacturing Chemists' Association. Sulfur chlorides are fuming liquids with pungent identifying odors. In either the liquid or vapor form they are highly irritating to the skin or eyes and inhalation of the vapors in sufficient concentrations may be injurious to the lungs. A 1 ppm maximum allowable concentration of the vapors in working areas for an 8-hour working day is recommended. Sulfur chlorides are classified by the Interstate Commerce Commission as corrosive liquids. Copies of Chemical Safety Data Sheet SD-77 on Sulfur Chlorides are available at 30 cents each from the Manufacturing Chemists' Association, Inc., 1825 Connecticut Ave., N. W., Washington 9, D. C.

933 International Medical Journal.

Medicina Universalis, a new periodical published in 6 languages, has been established to achieve greater international cooperation in the medical field. Headquarters are in Paris, 71 rue Sainte-Anne. Contributions from physicians and biologists are requested for consideration. Ionel Rapaport, assistant professor in the Psychiatric Institute at the University of Wisconsin, has been appointed editor for the United States. Articles may be addressed to him at 418 North Randall Avenue, Madison, Wisconsin.

-- Science

03120623

OCCUPATIONAL DISEASE STATISTICS

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

	Colo. May-July	Conn. July	Pa. Aug.-Sept.	Total
Alkali poisoning	1			1
Anthraco-silicosis			25	25
Barotitis	1			1
Cyanosis			1	1
Dermatitis	35	31*	39	105
Fumes (unidentified)			2	2
Parathion	3			3
Phosdrin	1			1
Pneumonitis (suspected)			1	1
Pneumoconiosis	1		68	69
Pneumoconiosis (suspected)			8	8
Respiratory irritation			1	1
Siderosis	1			1
Silicosis	3	1	25	29
Silicosis (suspected)			9	9
Silico-tuberculosis			1	1
Solvents (poisoning)	1	1		2
Tick fever	2			2
Vanadium poisoning	2			2
Miscellaneous	7			7
Total	58	33	180	271

* Causes are listed as follows:

Connecticut: Occupational dermatitis due to plants: poison ivy 1, fruits and vegetables 1; occupational dermatitis due to oils and greases and metal cutting compounds 6; occupational dermatitis due to solvents 3; occupational dermatitis due to drugs, wound dressings and medications 1; occupational dermatitis due to other chemicals: photography chemicals 1, cyanides 2, rubber chemicals 3, synthetic resins or resin compounds 2, alkalis 1, miscellaneous 5; occupational dermatitis—other: soaps or detergents 3, animal fur 1, unidentified 1.

COMING EVENTS

- 935 Oct. 26-27 Industrial Hygiene Foundation, 25th Annual Meeting (Silver Anniversary)
Pittsburgh, Pa.
- Oct. 31-Nov. 2 13th Annual Conference on Electrical Techniques in Medicine and Biology,
Washington, D.C.
- Oct. 31-Nov. 4 American Public Health Association, San Francisco, Calif.
- Nov. 2-4 Eastern Analytical Symposium, Analytical groups of New York and New
Jersey, American Chemical Society Sections, New York, N.Y.
- Nov. 2-4 Plasma Physics, 2nd Annual Meeting, Gatlinburg, Tenn.

03120624

- Nov. 2-5 American Society of Parasitologists, Los Angeles, Calif.
 Nov. 2-5 American Society of Tropical Medicine and Hygiene, Los Angeles, Calif.
 Nov. 2-5 American Speech and Hearing Association, Los Angeles, Calif.
 Nov. 3-4 Muscle as a Tissue Conference, Philadelphia, Pa. (Division of Research, Lankenau Hospital, Philadelphia 31, Pa.)
 Nov. 4-5 Central Society for Clinical Research, Chicago, Ill.
 Nov. 4-5 West-Central States Biochemical Conference, Lincoln, Nebraska.
 Nov. 4-6 Association of Clinical Scientists, Washington, D.C.
 Nov. 6-9 Canadian Chemical Engineering Conference, Chemical Engineering Div. of Chemical Institute of Canada, Quebec.
 Nov. 7 Society of Plastics Engineers, Automation in Injection and Compression Molding, Toronto, Ontario, Canada.
 Nov. 7-9 Second Biennial Parade of Scientific Instruments and Symposium. Standard Scientific Supply Corporation, New York, N.Y.
 Nov. 9-11 Clinical Chemistry Methods, Symposium, Cleveland, Ohio.
 Nov. 9-11 Pittsburgh Diffraction Conference, Pittsburgh, Pa.
 Nov. 12-19 Fifth Pan American Congress of Pharmacy and Biochemistry, Santiago, Chile.
 Nov. 15-19 Puerto Rico Medical Association, Santurce, Puerto Rico.
 Nov. 17-20 Southern Thoracic Surgical Association, Nassau, Bahamas.
 Nov. 18-19 American Medical Writers' Association, Chicago, Ill.
 Nov. 25-26 American Physical Society, University of Chicago, Chicago, Ill.
 Nov. 30-Dec. 3 Canadian Heart Association and National Heart Foundation of Canada, Toronto, Ontario, Canada.
 Dec. 3-8 American Academy of Dermatology and Syphilology, Chicago, Ill.
 Dec. 9 American Rheumatism Association, Dallas, Texas.
 Dec. 10-11 Academy of Psychoanalysis, New York, N.Y.

LEGAL DEVELOPMENTS

936 President Approves Motor Exhaust Study.

An Act originated in the House of Representatives as Bill H. R. 8238 "to authorize and direct the Surgeon General of the Public Health Service to make a study and report to Congress... of the discharge of substances into the atmosphere from the exhausts of motor vehicles," was passed by both the House and Senate and signed by the President on June 8, 1960, and will henceforth be known as Public Law 86-493. Section 2 of the law provides that the Surgeon General shall submit his report together with his recommendations, based on the results of the study, "as soon as practicable, but not later than two years" following the passage of the Act. Section 3 defines the term "motor vehicles" as being those propelled by mechanical power and used for transporting passengers or property on a highway.

937 Nation's Capitol Has New Plan to Curb Auto Fumes.

Engineer Commissioner, A. C. Welling, recently announced plans to help reduce air pollution from traffic exhaust fumes in Washington. General Welling's proposals include three major provisions. The first would require that all new motor vehicles registered in the District beginning with the 1962 models be equipped with a "blow-by" device to cut down escaping combustion gases. The second would set a three-minute motor idling limit (except in below-freezing weather) for vehicles not in the stream of traffic. The final provision would forbid operation of a vehicle where there is "visible smoke or fumes from the exhaust for more than one-tenth of a mile." These proposals, if approved, will make Washington the first city to require the "blow-by" device.

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938 United States Supreme Court Hands Down Two Great Lakes Decisions.

The United States Supreme Court, in April, upheld application of the Detroit anti-smog ordinance against shipping in the Detroit River. The case had been appealed to the high tribunal by the Huron Portland Cement Company after the State Courts rejected the Company's request for an injunction against enforcement of the ordinance claiming that the boilers of its vessels are operated under federal regulations (coast guard license). Another ruling by the Supreme Court in May held that the United States may prohibit the discharge of liquid industrial wastes into navigable waters. The case involved waste materials in liquid form from steel mill operations into the Calumet River. The Court said the deposit of the waste, even though small, reduced the navigable capacity of the river and is not exempt under the Federal Rivers and Harbors Act of 1899.

939 Radiation: Registration of Sources. D. F. Dullum.
Calif. Med. 92, 198-200 (Mar. 1960).

Registration of sources of ionizing radiation, including x-ray machines and radioactive material used in healing professions, is required by legislation recently enacted in California. Registration will provide information concerning the type and location of sources of radiation and will provide a basis for the evaluation of a need for additional radiation control and protection measures in the future. As the medical uses of radiation procedures constitute a major portion of the total radiation exposure of the entire population, it becomes increasingly important that physicians should develop a reasonable and knowledgeable concept not only of the obvious benefits but also of the actual and potential hazards of radiation as used in medicine. Practical and effective measures to minimize patient exposure, based on professional knowledge, competence, and experience, with profession-wide participation and support, will insure the effective integration of the medical uses of radiation in the California Atomic Energy Development and Radiation Protection Program.

-- J. Am. Med. Assoc. Absts.

940 Tuberculosis—Date of Contraction—Exposure to Disease.

A decision of the Industrial Commission granting compensation for disability resulting from tuberculosis was held to be proper. During 1953, the claimant was employed in a hospital position conclusively proved to have been a source of exposure to tuberculosis. On January 1, 1954, ownership of the hospital changed and the claimant continued to work for the new owner. X-rays taken periodically up to July 1955 were negative, but on October 10, 1956, they revealed tuberculosis which culminated, in November, in the impairment of bodily functions and disability. Each of the employers contended that the liability, if any, should rest on the other and that, in any case, the employee was barred from compensation because the disease was not contracted within the 12 months prior to the date of disablement. The Commission held that the contraction of any such disease is a process which may extend over a long period of time and of which the employee may not become aware until it first manifests itself by impairment of bodily function. It further held that, since it was a definitely established fact that no subsequent exposure to tuberculosis occurred after the new owner acquired the hospital, the liability rested entirely on the former owner. Affirmed. Kalmes v. Kahler Corporation. Minnesota Supreme Court. No. 37780. May 13, 1960.

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941 Caisson Disease—Apportionment of Award—Exposure to Compressed Air—Burden of Proof.

An employer appealed a decision finding it solely responsible for the claimant's disabling caisson disease which resulted from work associated with compressed air. The claimant had previously worked for two other employers, both employments requiring work under compressed air. The first decision found the three employers responsible and apportioned compensation among them. Before final determination of the compensation it was discovered that no date of contraction of the disease was established and the decision was remitted. An employer made liable for total compensation, according to the Workmen's Compensation Law,

may appeal for an apportionment among the several employers engaged in business likely to have resulted in the contraction of the disease. However, since the exposures occurred prior to July 1, 1946, no statutory presumption of injurious nature was available and, therefore, the employer had to prove that the prior exposures to the compressed air were injurious. Since the employer failed to sustain that burden, the court upheld the former decision.

Affirmed. Ryan v. Patrick McGovern, Inc. New York Supreme Court, Appellate Division, Third Judicial Department. No. 2374. May 5, 1960.

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BOOKS, PAMPHLETS AND NOTICES

- 942 The Health of People Who Work. Edited by A. Q. Maisel. The National Health Council, 1790 Broadway, New York 19, N. Y. 268 pp. (1960). \$4.50.

This book is useful to those whose work involves cooperation with business in protecting the health of workers. It is a valuable guide for labor negotiators, public health officers, hospital and clinic directors, voluntary health agency executives, and chamber of commerce secretaries. It provides a good factual basis for relations among business, labor, the professions and community services. It is based on the reports to the 1959 National Health Forum of more than 200 industrial medical directors. The subjects covered include the goals of occupational health programs, are occupational health programs worthwhile?, special problems of the smaller plant, control of the working environment, occupational health and the living environment, placement of workers in relation to their physical and mental capacities, the role of occupational health programs with respect to the emotional problems of worker, health education in the occupational setting, preparing the worker for retirement, finding manpower and cooperation for the occupational health program, occupational medicine's relation to health insurance and other fringe benefit programs, and earning support for the occupational health program.

- 943 Occupational Dermatitis in California. State of California, Department of Public Health, Bureau of Occupational Health, 2151 Berkeley Way, Berkeley 4, Calif. 29 pp. (1958).

In 1958, 9,126 cases of occupational dermatitis were reported exclusive of poison oak. Three-fifths of these cases were reported as contact dermatitis. Hands and wrists were the sites most frequently reported. Physicians indicated that 50% of the cases would require treatment up to 28 days and that 10% would require even longer treatment. Although complete data are not available, women appear to be more susceptible than men to occupational dermatitis. On 20% of the cases reported, the physician indicated that time would be lost from work. Manufacturing and agriculture are the industry categories where workers are at highest risk. A wide variety of dermatitis producing agents were reported and these varied by industry group.

-- Author's summary

- 944 Health Statistics from the U.S. National Health Survey. Series B-No. 18. Acute Conditions Incidence and Associated Disability. United States, July 1958 - June 1959. U. S. Department of Health, Education and Welfare. Public Health Service. PHS Publication No. 584-B18. 34 pp. (June 1960). For sale by Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C. 30 cents.

This report presents national estimates of the incidence of acute conditions that either involved medical attention or resulted in one or more days of activity restriction during the 12-month period, July 1958 - June 1959. The annual estimates shown are classified by condition group, sex, age, and major activity. Of the estimated total of 367.9 million acute conditions occurring during the 12-month period ending June 1959, 215.3 million (58.5%) were respiratory

conditions. Two thirds of the respiratory conditions were diseases of the upper respiratory tract such as the common cold, acute sinusitis, pharyngitis, tonsillitis, laryngitis, and tracheitis. The largest component of this upper respiratory group was the common cold. About 115.3 million colds involving activity restriction or medical attention were estimated to have occurred during the year, a rate of 67.3 colds per 100 persons in the population. The other one-third of the respiratory conditions were conditions such as influenza, bronchitis, pneumonia, and pleurisy. There were 73.0 million conditions in the latter group, representing 19.8% of all acute conditions occurring during the year. The second most common group of acute conditions were injuries, which accounted for 13.4% of all acute conditions, and then the infectious and parasitic diseases which accounted for 12.0% of the total. These two groups of conditions were the only ones in which the rate for males was higher than that for females. Difference in the injuries are especially marked, particularly for open wounds and lacerations which were more than twice as frequent for males as for females.

- 945 Incinerators. (NFPA No. 82). National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass. 32 pp. (1960). 50 cents.

A newly revised standard on the installation and operation of incinerators has just been issued by the National Fire Protection Association. Designed to provide for the fire-safe installation of this equipment and minimize various hazards, the standard was developed by the NFPA Committee on Chimneys and Heating Equipment under the chairmanship of E. W. Fowler, chief engineer of the National Board of Fire Underwriters. It was adopted at the recent NFPA annual meeting in Montreal. The 1960 edition includes changes on such features as the instruction to be provided for the operation of incinerators, screens or other protection, and a revised definition of combustible material to be protected. Also included is material on rubbish handling covering many details of proper procedure in the ever-present problem of disposing of combustible waste materials.

- 946 Sprinkler Systems. (NFPA No. 13). National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass. 176 pp. (1960). \$1.50.

A new standard for the installation of sprinkler systems has been released by the National Fire Protection Association. Providing detailed guidance on this subject, the 1960 edition of this work incorporates a number of changes from earlier issues. Among them is a complete reorganization and renumbering of the provisions on location and spacing of sprinklers. Last revised in 1958, the standard dates back to 1896. It is almost universally used as the authoritative guide to proper sprinkler installation practices. The revised text was adopted at the 1960 annual meeting of the National Fire Protection Association. It was prepared by a representative committee under the chairmanship of Gordon F. Price of the South-Eastern Underwriters Association, Atlanta, Georgia.

- 947 Tantalum and Tantalum Alloys. F. F. Schmidt. DMIC Report 133 (OTS PB 151091) Defense Metals Information Center, Battelle Memorial Institute, Columbus 1, Ohio. 328 pp. (July 25, 1960). No price given.

A descriptive literature survey has been made covering physical properties, process metallurgy, binary and ternary alloy systems, chemical properties, and metallurgical properties of tantalum and tantalum alloys. Tantalum has only moderate strength at room temperature; however, the elevated-temperature strength decreases slowly in comparison with that of many other metals. The low ductile-to-brittle behavior, excellent fabricability, high melting point, and high solubility for interstitial and substitutional elements make tantalum an attractive candidate for use in high-temperature high-strength alloys. Refractory metals that exhibit brittle behavior at room temperature, such as molybdenum and tungsten, can be alloyed with tantalum to form tantalum-base alloys with a combination of high-temperature strength and low-temperature ductility not found in many metallic materials designed for ultra-high-temperature service.

-- Cond. from author's summary

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INDUSTRIAL MEDICAL PRACTICE

- 948 Health Insurance Coverage of Hospital Care for Mental Illness. L. S. Reed.
Am. J. Public Health 50, 1177-1188 (Aug. 1960).

Health insurance coverage of hospital mental illness is desirable. Commercial insurance and some Blue Cross plans are providing full or reasonably good coverage of hospital care for mental illness. Other Blue Cross plans could provide such coverage for up to, say, 60 days for not more than 5% of present subscription costs. One difference in hospital care for mental and general illness is the long stay of some mental hospital cases. One may doubt the ability of private insurance successfully to cover long-term mental hospital care. Accordingly, some demarcation of public and private responsibility in this area seems desirable. One solution would be for private insurance to provide full coverage of mental cases in general hospitals and coverage for up to 60 or 90 days in private and public mental hospitals and for government to provide long-term care, i.e., after 60 or 90 days, in the state public mental hospitals as a free public service. However, there are many factors to be considered, and this may not be the best solution. At any rate, the nature and dimensions of the problem to be faced have been delineated to some extent.

-- Author's summary

- 949 Blunt Trauma to the Abdomen. G. L. Watkins.
A.M.A. Arch. Surg. 80, 187 (1960).

During 10 years, 141 patients presenting with abdominal injuries caused by blunt trauma were admitted to the St. Louis City Hospital. The majority were involved in car accidents and 40% were admitted between 10:00 p.m. and 6:00 a.m. The largest group was made up of contusions of the abdominal wall, none of whom died. Among the 56 patients with ruptured spleen, 31 had other injuries, such as fractured ribs and legs, and 3 had other organs injured. Peritoneal tap aided in the diagnosis in 16 cases and a leukocytosis of over 20,000 was noted in 30%. Delayed rupture occurred in 14% and in one case, not until 3 months later. There were 14 cases of injuries to the gastrointestinal tract: one perforation of the stomach, 7 of the jejunum, 3 of the ileum, 2 of the colon and one of the duodenum. The liver was injured in 6 and the cystic artery in one. There were 4 pancreatic injuries, all producing an elevated serum amylase level, and resulting in pseudocysts in 3 cases. Of the 8 lacerated kidneys, 5 were treated by nephrectomy. There were 10 ruptured bladders, 9 associated with fractures of the pelvis and 5 shorn off at the urethral junction. Deaths were mostly among those with multiple injuries.

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

- 950 Glaucoma Detection: A Problem for General Medicine. J. A. Buesseler.
Missouri Med. 57, 447-449 (Apr. 1960).

Blindness from glaucoma can usually be prevented or arrested by early diagnosis and treatment. "Open-angle" or so-called chronic simple glaucoma poses the major problem. There is no pain or visual disability in the early stages of this disease; however, the increase in ocular tension of a mild to moderate degree is a measurable early sign. In the past, the ophthalmologist has borne the major burden for glaucoma detection. Unfortunately, victims of glaucoma frequently have not referred themselves to an eye physician until after far-advanced and irreversible damage has been done to the visual apparatus. To prevent these tragedies of late diagnosis in glaucoma, the general practitioner occupies a key position in any realistic detection program. The determination of ocular tension by means of a tonometer must be incorporated into every physician's routine physical examination on patients over 30 years of age. Once glaucoma has been detected, the ophthalmologist must meticulously evaluate the individual case in regard to the type of glaucomatous process involved, the degree of impairment of the hydrodynamic mechanism in the eye, and the manifestations of damage to the visual system of the patient.

-- J. Am. Med. Assn. Absts.

- 951 Tobacco Amblyopia. H. S. Hedges. *Virginia Med. Monthly* 87, 144-145 (Mar. 1960).

The author reports 4 cases of eye damage from tobacco. Sudden blackouts may occur, probably caused by constricting spasms of some of the cerebral vessels. The first patient was a trailer truck driver. He said that sometimes, when driving, suddenly everything went black before him; he could not see a thing and had to get off the road as best he could and wait till his sight came back. The author ordered him to stop smoking, and the man reported later that he had not had a blackout since he had stopped. Not all these blackouts are binocular; when only eye is involved, often the upper extremity of the same side is paralyzed. Premature presbyopia occurs, especially among women smokers, who generally first complain of dull headache and asthenopia on close work. The second case presented was that of a 38-year-old man who was unable to read newspaper print even with a glass intended for one 10 years older. When he stopped chain-smoking, all trouble disappeared. If these cases are not arrested, a central scotoma develops for red and green, which is relative at first, but which gradually increases till all perception of central red and green is gone. A 50-year-old man lost his job because of defective eyesight. Since his eyes indicated damage from tobacco, he was asked to stop smoking, and he has recovered. The fourth patient was a 62-year-old man, a heavy smoker, who had been told by ophthalmologists that nothing could be done for his advancing blindness. When he was ordered not to smoke for 3 months, his uncorrected vision recovered to 20/30. Advanced cases of eye damage from tobacco occur in long-time smokers, and the cigar is the worst offender, though the cigarette is by no means harmless. Moderate smoking of mild tobacco does not seem to do much harm.

-- J. Am. Med. Assn. Absts.

- 952 Mass Screening for Tuberculosis and Missed Cases. D. A. Trauger, G. V. Hromadka and Eleanor C. Connolly. *Am. J. Public Health* 50, 829-836 (June 1960).

In Long Beach, California, during the years, 1954, 1955, and 1956, a total of 52 new active cases were found through x-ray screening of persons who appeared for screening on their own initiative or as part of a pre-employment examination. This number represented about 10% of all new active cases reported to the health department. Twenty-two of the 52 persons had either a history of contact with active tuberculosis at some previous period or had been under medical supervision during the year prior to their diagnosis as a tuberculosis case. Four of these 22 had both a history of contact and recent medical supervision. Thirty of the 52 persons found apparently could not have been found in an earlier stage of disease except through more widespread practice of routine medical examination or through earlier appearance in a tuberculosis screening program.

-- Authors' summary

- 953 Inhalation and Skin Test in the Diagnosis of Asthma Bronchiale. H. Nilsson and J. Kaude. *Diseases of Chest* 37, 535 (1960).

The inhalation test is a valuable investigational method in the diagnosis of bronchial asthma. It can be carried out simply and safely, its results being superior to those of skin tests. Observations based upon 1070 inhalation tests in 200 asthmatics showed that dermal sensitivity corresponds to pulmonary sensitivity in only one-third of cases with positive skin tests. However, in the presence of strong skin reactions the incidence of positive inhalation tests is high. Milder skin reactions are less valuable in selection of allergens for performance of inhalation tests. The highest coincidence of positive skin and pulmonary reactions was found in tests with animal hair extracts. In cases of negative skin test and allergen concerned may induce a positive inhalation test in approximately 21%. The authors suggest that the inhalation test be cautiously employed as an adjunct to skin testing.

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

- 954 Etiological Investigation of Arteriosclerotic Heart Disease. J. F. Cantelon. *Can. Med. Assn. J.* 83, 326-327 (Aug. 13, 1960).

There is a genetic factor present in many patients with arteriosclerotic heart disease that was evident in 35% of the group studied. Diabetes mellitus was found in 27%, which was in keeping with the finding that of 100 consecutive deaths in the diabetic clinic of the out-

patient department of the Toronto Western Hospital more than 60% were due to arteriosclerotic heart disease. Overweight was found to be a factor in 50% of the cases, a high-fat diet in 48%, and hypertension in 25%. In the age group 44-54 years, overweight was noted in 60% and a diet high in animal fat in 67%. One female was known to have had arteriosclerotic heart disease since age 35, at which time she had an acute myocardial infarction; she had normal endocrine function but had lived almost entirely on a diet of fried hamburgers and fried potatoes. The serum cholesterol level was elevated in 33% of cases but only markedly elevated in 15%. Hyperuricemia was not a common finding, occurring in 6 cases (10%); it was markedly elevated in only one case (1.7%). This is in marked contrast to the report of Kohn and Prozan (J. Am. Med. Assn. 170, 1909 (1959)), who found that 20 out of 35 males and 6 out of 15 females with acute myocardial infarction had a serum uric acid level above 6 mg. per 100 ml. They were reporting on cases of acute myocardial infarction, whereas this report was based on cases of chronic arteriosclerotic heart disease.

-- Cond. from author's conclusions

- 955 Environmental Factors in Coronary Heart Disease. An Epidemiological Study at Agra (India). K. S. Mathur. *Circulation* 21, 684 (1960).

Various factors relating to coronary heart disease were investigated in two groups of patients: 553 patients with clinical coronary heart disease and 1056 persons selected in a field survey of the general population of Agra, India. The incidence of coronary disease was higher in the urban population, in the upper socio-economic classes, and in persons with the highest amounts of total dietary fat and highest percentage of calories from dietary fat. Values for total serum cholesterol, serum phospholipid, and cholesterol/phospholipid ratio were higher in the coronary group. Finally, it seems that physical activity was less and emotional stress and strain greater in the patients with coronary disease. No relation between coronary disease and smoking or alcohol was established.

-- Can. Med. Assn. J. Abats.

- 956 Smoking Patterns of University Students in Canada. C. Culling, P. Vassar and A. M. Saunders. *Can. Med. Assn. J.* 83, 530-532 (Sept. 3, 1960).

This paper presents a survey of the smoking patterns of an undergraduate university population of 943 students (399 males, 544 females). It was found that 43.6% had never smoked, 46.1% are present smokers, and 10.3% were previous smokers. The mean age at which smoking was started was 16.25 years. There appeared to be no significant difference in the smoking habits between males and females. It is strongly urged that an anti-smoking program should be directed primarily at the age group 13 to 19 years.

-- Authors' summary

- 957 The Continuous Alternating Chemotherapy of Cancer. M. Aronovitch. *Can. Med. Assn. J.* 83, 355-364 (Aug. 20, 1960).

The hypothesis is presented that chemotherapy of carcinoma should be a continuous long-term process. The evolution of this concept is supported by illustrative case material where such therapy was not used and by examples and discussion from the literature. Some case reports are presented of improvement on continuous treatment, but the follow-up has been too short to form any firm conclusion. In the face of improvement it is, however, reasonable to continue further observations with this procedure.

-- Author's summary

- 958 The Pathologic Effects of Smoking Tobacco on the Trachea and Bronchial Mucosa. K. P. Knudtson. *Am. J. Clin. Pathol.* 33, 310-317 (Apr. 1960).

The author studied 150 lungs which were removed from men, aged 23 to 85 years, who had died at the Veterans Administration Hospital in Seattle, Washington, and on whom autopsies had been performed. A printed questionnaire was mailed to the next of kin of these men in order to obtain definitive data on the smoking history of the patients, their occupation, and place of residence. For microscopic examination, longitudinal strips of mucosa were

removed, starting at the proximal cut margin of the trachea, and extending continuously to the periphery of the lower lobe of each lung. The strips were then coiled in a "Swiss role". Three to 5 sections were cut from each "Swiss role" and stained with hematoxylin and eosin. The changes noted were correlated with the history of smoking, age of the patient, occupation, and site of residence. Normal mucous membrane was observed in 50% of the specimens obtained from nonsmokers, as compared to that in 20% of the specimens obtained from heavy smokers. The carina was the most frequent site of metaplasia. Age, occupation, and site of residence had no appreciable relation to the changes in the bronchial mucosa. The author visualizes the sequence of changes in the mucosa of the respiratory tract as follows: basal cell hyperplasia with reduction in mucous secretion, followed by metaplasia of the basal elements to squamous epithelial cells, and maturation of these cells to form keratinized epithelium. The function of the cilia is thus lost, and normal secretions are further suppressed. Focal areas of epithelium are occasionally subjected to irritation and superimposed infections that result in atypical proliferative change. There is the impression that basal cell hyperplasia, squamous metaplasia, and atypical proliferative change represent changes significantly increasing in that order, and are in all probability consecutive states in mucosal transformation to cancer of the lung.

-- J. Am. Med. Assn. Absts.

- 959 Human Inhalation Anthrax: A Report of 3 Fatal Cases. W. S. Albrink, et al.
Am. J. Pathol. 36, 457-468 (Apr. 1960).

During a 10-week period in 1957, autopsies performed on 3 textile workers from Manchester, N. H., revealed disseminated infection with *Bacillus anthracis* as the cause of death. During this time, 4 nonfatal cases of cutaneous anthrax and 2 other suspected but unproved cases of inhalation anthrax were observed. The present report is concerned with pathologic findings in the 3 fatal cases. Two of the 3 patients showed massive hemorrhagic mediastinitis; one of these and the 3rd patient were found to have hemorrhagic meningitis. Other secondary manifestations were hemorrhagic thyroiditis in one patient and ulcerations of the ileal mucosa in another. In each instance the onset was insidious, the clinical manifestations were obscure, and the course of the disease was fulminating. Recognition of anthrax is extremely difficult and the diagnosis is rarely made prior to death. The observed pathologic alterations support the following conclusions regarding pathogenesis, based in turn on previously reported experimental work: (1) anthrax spores contained in small particles (5 microns or less) are deposited in alveoli where phagocytosis by large mononuclear cells is followed by transport across alveolar walls to regional lymph nodes via lymphatic channels; (2) although germination of some spores may occur en route, maturation usually eventuates after deposition in lymph nodes; multiplication of vegetative forms results in necrosis and hemorrhage in the nodes, and organisms may spread directly to contiguous structures (mediastinum and the walls of the trachea and bronchi); (3) septicemia and dissemination of either spore-containing macrophages or vegetative forms result in such secondary manifestations as edema, hemorrhage, meningitis, or ulceration in the alimentary tract.

-- J. Am. Med. Assn. Absts.

SKIN DISEASES AND BURNS

- 960 Bechet's Disease as a Multiple Symptom Complex. C. Berlin.
Arch. Dermatol. 82, 73 (July 1960).

According to the literature and the 10 cases of the author, Bechet's disease appears as multiple manifestations, exhibiting vascular changes of allergic, inflammatory, or ulcerative character. It may involve the skin, predominantly of the genital region, the mouth, the eyes, the joints, the brain, and the viscera. The peculiar reactivity of the skin to intradermal saline injection, and even to a needle puncture, is of diagnostic value. The course is latent or active. The active course is characterized by acute episodes of various symptoms recurring

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singly or simultaneously, at irregular, frequent, or infrequent intervals. The prognosis depends on the organs affected. The involvement of the brain may cause death, of the eyes visual impairment or blindness. On the other hand, a mild course may be encountered, with attacks occurring infrequently, and eventuating in an apparent cure.

-- J. Am. Med. Assn. Absts.

- 961 Role of Dermal Sensitivity in Ragweed Contact Dermatitis. S. Epstein.
Arch. Dermatol. 82, 48 (July 1960).

Dermal delayed (tuberculin-type) sensitivity often can be demonstrated in ragweed contact dermatitis by intradermal tests with diluted extracts of the oleoresin fraction. The papular response to patch tests, which is encountered more often than a vesicular reaction, indicates that dermal sensitivity is probably the main, and at times, the only form of contact sensitivity responsible for the dermatitis. This dermal sensitivity probably accounts for some of the clinical characteristics of ragweed contact dermatitis and its prolonged course. Out of 16 patients suffering from ragweed contact dermatitis and tested, both with path and intradermal tests with ragweed oil solutions of suspensions, 11 gave positive reactions to the intradermal tests, 3 gave questionable reactions, and 2 gave negative ones. One patient of this series also showed a photocontact sensitivity to the ragweed oil.

-- J. Am. Med. Assn. Absts.

- 962 Histopathology of Drug Eruptions. M. L. Matte, H. Winer and E. T. Wright.
Arch. Dermatol. 82, 56 (July 1960).

The histopathology of drug eruptions was studied in an attempt to find specific changes which would be of diagnostic value. Biopsy specimens were examined from 206 patients with cutaneous eruptions due to a variety of medications, the most common being penicillin, barbiturates, and sulfonamides. The primary pathology was located in the upper half of the dermis and consisted of a lymphocytic perivascular infiltrate, protrusion of the endothelial cells into the lumen of the vessels, hyalinization of the vessel walls, subepidermal edema, and dropping off of melanin from the basal layer into the dermis. Epidermal changes were not remarkable except for mild spongiosis and colloquative degeneration in severe vesiculobullous reactions. The lymphocyte was the most frequently encountered inflammatory cell. The eosinophil was occasionally present but was usually not perivascular in location. -- J. Am. Med. Assn. Absts.

- 963 Rubber Glove Dermatitis. H. T. H. Wilson. Brit. Med. J. 2, 21-23 (July 2, 1960).

Forty-two cases of rubber glove dermatitis are described. The pattern of the rash is usually characteristic, but not invariably so. Untreated rubber latex appeared harmless, and in 40 cases dermatitis was due to accelerators, usually thiuram compounds or mercaptobenzthiazole. Patch tests with these chemicals were more reliable than tests with rubber material. In two cases the cause of the dermatitis was unexplained. Thirteen out of 30 cases had a pre-existing hand eczema.

-- Author's summary

- 964 Norwegian Scabies. H. C. Maguire, Jr., et al. Arch. Dermatol. 82, 62 (July 1960).

Four cases of Norwegian scabies in male mongoloids were found in an institution for mental defectives. Until cured, these cases of Norwegian scabies seeded many cases of ordinary scabies at the institution. Norwegian scabies is a rare variant of ordinary scabies in which areas of the skin become hyperkeratotic and infested with hundreds of thousands of scabetic mites. Finding the mite in the scale from a clinically involved area is easy and confirms the diagnosis immediately. Norwegian scabies seeks out the patient already debilitated by mental or neurological disease; it is moderately contagious and responds to intensive treatment with the usual scabecides.

-- J. Am. Med. Assn. Absts.

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samples (0.5 to 1 mg.) can be analyzed in 10 minutes. The titration method uses a variable voltage and variable current coulometer connected directly to the combustion apparatus. The current is varied as needed to maintain a constant level of silver ions in the titration cell during the titration. The current multiplied by the time integrated and recorded.

-- AC Briefs

- 973 A Survey of Results of Investigations on Some Organic Mercury Compounds Used as Fungicides. K. D. Lundgren and A. Swensson. *Am. Ind. Hyg. Assn. J.* 21, 308-311 (Aug. 1960).

It may be emphasized that the symptoms of poisoning with alkyl mercury compounds are quite different from the symptoms, for example, of poisoning with corrosive sublimate. The toxicity of different organic mercury compounds used as fungicides is roughly the same. Nevertheless the risks are greater in connection with alkyl mercury than with phenyl mercury compounds depending on differences in volatility and behavior within the organism. The excretion of alkyl mercury compounds is slower, thus allowing the possibility of accumulation. In spite of this, it has been shown to be possible to handle these substances safely. Determination of the excretion of mercury in the urine of the employees and of the content of mercury in the air is a valuable aid in controlling the hazard and guiding technical improvements.

-- Authors' conclusions

- 974 Affections of the Larynx in Chronic Occupational Mercury Poisoning. G. Faleg and R. Lenzi. *Rass. med. ind.* 28, 299-305 (July-Aug. 1959). Italian.

The authors describe investigations carried out on 105 male and 195 female workers in the felt hat and fur industries who were suffering from chronic mercury poisoning and who all were receiving compensation at rates varying from 21 to 100%. None had worked at their trade for less than 15 years. Among them, 22 men, and 52 women had some laryngeal condition. This was classified into (a) allergic; (b) nervous; (c) catarrhal. (a) The allergic condition was seen in 5 men and 10 women. The vocal cords were mainly affected though the functional disturbance was greater than the laryngoscopic appearances might lead one to think; attempts to start work with mercury caused exacerbation. (b) The nervous condition was seen in 4 men and 14 women. Aphonia was the main symptom; sometimes there was either partial or completely paralysis of the muscles of phonation seen mainly in women; it was particularly noticeable in patients in whom the chronic mercury poisoning was manifested by predominantly neuropsychological symptoms. (c) The catarrhal condition occurred in 13 men and 28 women. The clinical picture was that of a chronic catarrhal laryngitis with dysphonia. Examination showed mucosal hyperemia, hyperadduction of the ventricular bands in phonation and particularly chronic laryngitis of the vestibule. The authors summarize by saying that 24.66% of their patients had a condition referable to the larynx and that this organ can frequently be injured in mercury poisoning; chronic catarrhal laryngitis is the most frequent form of damage.

-- Cond. from Bull. Hyg.

- 975 Prophylaxis, Therapy and Rehabilitation of Lead Workers. D. Schiemann. *Z. ges. Hyg. u. ihre Grenzgebiete* 6, 20-38 (Jan. 1960). German.

The author bases his prophylactic measures on a system of supervision of all lead workers; this includes clinical examination, and monthly examination of blood films for punctate basophilia. By this means the workers are divided into 3 groups—those in Stage I are "lead carriers", in Stage II lead dyscrasias, and Stage III lead toxicoses. Punctate basophilia is specific for lead poisoning only when the level reaches 6 in 50 microscopic fields. In Stage I the level is 6 to 25, in Stage II 26 to 80, in Stage III over 80, sometimes 230, more rarely up to 300. The stages tend to merge into each other, but the outstanding problem from the prophylactic point of view is that of deciding when Stage I is likely to develop into Stage II or III. By keeping charts of the numbers of work people in the different stages over a number of years it is possible to distinguish a group who remain in Stage I and who are therefore regarded as a source of apparently lead-resistant individuals. During the period 1953 to 1955, when there was an improvement in working conditions, including the use of colloid filter masks, there was practically no rise in the Stage III curve; this was attributed to the fact that all patients

in Stage II were given suitable therapy, and that no person suspected of gastric disorder was employed. Treatment in Stage I consists of bivalent iron administration until the punctate basophilia is not greater than 5 per 50 fields; this is usually within 4 weeks. Stage II necessitates removal from exposure. For colic, atropine or papaverine are given; for anorexia a pepsin mixture; for constipation, except when colic is present, castor oil followed by oil and soap enemas. Rehabilitation of the very severe cases of lead toxicosis, who can never be re-exposed, is largely a social and financial problem, referable to governmental compensation, as also is that of workers who are able to be absorbed into non-lead work with the same company but at a lower wage.

-- Cond. from Bull. Hyg.

- 976 Clinical Study of Chloroform Anesthesia: A Preliminary Report. J. G. Reynolds, D. M. Thomas and E. H. Conner. J. Kentucky Med. Assn. 58, 340-344 (Mar. 1960).

The authors report on 62 unselected patients, between the ages of 20 months and 88 years, to whom chloroform was administered. The duration of anesthesia varied from 30 minutes to 10 1/2 hours. Anesthesia was induced either with thiopental sodium or with a combination of chloroform, nitrous oxide and oxygen. When intubation of the trachea was performed, succinylcholine chloride, in doses of 40 to 60 mg. was used to provide muscular relaxation. The concentration of chloroform was not allowed to exceed 2%, and, during maintenance, chloroform concentrations were held below 1%, usually ranging from 0.4 to 0.6%. Thymol turbidity and cephalin cholesterol flocculation tests of hepatic function were carried out in 31 of these patients. The tests showed no significant damage to the liver after chloroform anesthesia. Profound depression of the cardiovascular system with either sudden collapse or progressive fall in blood pressure during anesthesia was not observed in these patients, provided that the concentration of chloroform was under close control, that adequate ventilation was assured, and that hypoxia and hypercapnia were avoided. Controlled dosage, adequate ventilation, and careful observation of the patient at all times are important factors in insuring safe administration of chloroform.

-- J. Am. Med. Assn. Absts.

- 977 The Toxicity of Bromochloromethane (Methylene Chlorobromide) as Determined on Laboratory Animals. T. R. Torkelson, F. Oyen and V. K. Rowe. Am. Ind. Hyg. Assn. J. 21, 275-286 (Aug. 1960).

Bromochloromethane has been shown to be an effective fire extinguishing agent and it has therefore been considered as a replacement for carbon tetrachloride. Extensive studies using laboratory animals have been conducted to determine the acute and chronic vapor toxicity of this material. The material was found to cause a rather prolonged anesthesia at high concentrations and this was shown to be the cause of death in acute exposures. The material has only a slight capacity to cause liver injury and if such should occur, it is apparently reversible in nature as contrasted to the fibrotic changes resulting from much less severe exposures to carbon tetrachloride. Single exposures of various intensities were given to matched groups of rats in order to establish the exposure intensities resulting in essentially complete mortality; complete survival; and in no detectable organic injury. Repeated 7-hour daily exposures for 4 months of rats, rabbits, guinea pigs and mice to 1,000 ppm resulted in adverse effects in all species whereas exposures to 500 ppm caused only minor responses, these being limited to female rats. After 6 months of repeated 7-hour daily exposures to an average concentration of 370 ppm no effects of consequence were seen in a group of 20 female rats or in one male and one female dog. Blood bromide levels are reported for several species and for several exposure intensities. The standard for evaluating regular 7- to 8-hour daily exposures may be defined as the concentration below which practically all analytical results must fall. The value of 400 ppm is suggested as this standard for bromochloromethane, with a time-weighted average for all exposures not to exceed 200 ppm.

-- Authors' summary

- 978 How the Adhesive Manufacturer and User Can Eliminate Solvent Hazards. S. Moskowitz. Ind. Hyg. Rev. 3, 3-14 (May 1960).

This article confines itself to possible harmful effects of organic solvents on people, and what preventive measures can be taken. Hazards which might arise from the use of solvents

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or of solvent containing materials may be grouped under 3 general headings: (1) inhalation hazards; (2) dermatitis hazards; and (3) fire and explosion hazards. The author considers each of these categories separately. It is the responsibility of the industries involved to acquaint themselves with local requirements, if any, and current opinions on the subject. They must then decide whether or not the quantity of vapors which may be expelled from their plants is such as would exceed present or near-future standards for permissible emissions. If the quality is excessive, the problem of air cleaning must be considered. Solvent vapors lend themselves to 2 different kinds of air cleaning methods: (1) absorption, and (2) combustion. The first kind involves expensive equipment, but if the quality of solvent evaporated is large, it may pay for itself in recovered solvent. The second method, using either catalytic or with gas-fired afterburners, is less expensive initially but produces no byproducts other than heat. The latter type of air cleaning process must also be investigated from the point of view of the production of other atmospheric contaminants. If the solvents contain no elements other than carbon, hydrogen and oxygen, and combustion is reasonably complete, there is no problem.

INDUSTRIAL DUSTS

979 Chronic Interstitial Pneumonitis. A Histogenetic Study. P. Gross.

A.M.A. Arch. Pathol. 69, 706-715 (June 1960). Reprints available from Industrial Hygiene Foundation upon request.

In interstitial pneumonitis, the alveolar wall becomes thickened in one, or possibly in both, of 2 ways: (1) By expansion of its lateral borders, due to pressure of fluid, cells, connective tissue fibers, or combinations of these in the space between the capillaries and the surface epithelium. (2) By an accretive growth upon alveolar surfaces of alveolar cells and their associated reticulin network. Whereas the former gives rise to moderately thickened collagenous walls, it tends to leave alveolar spaces intact. The accretive growth of alveolar walls, on the other hand, compromises the alveolar spaces and often obliterates them. By the obliteration of contiguous air spaces, nodulations or more irregular foci of consolidation are formed, which ultimately may undergo collagenization and hyalinization. By confluence of these foci, major portions of lobes or entire lobes may become severely scarred and impaired in function. Because capillaries are difficult to identify in the pulmonary lesions of experimental animals studied, information regarding the contributions which these vessels make to interstitial pneumonitis is lacking. Human material offers only fragmentary information on this point. On the basis of observations in 2 cases of asbestosis, it appears likely that expansive alveolar fibrosis may be asymmetrical; i.e., the deposition of collagen may occur on only one side of a capillary over a given length, thereby allowing partial respiratory function. By the same token, it is likely that a capillary will become obliterated if collagen is deposited along both sides of the capillary in the space or potential space situated between the basement membrane of the capillary and that of the alveolar surface epithelium. Evidence that alveolar capillaries may proliferate is seen in profusions of capillaries found in apposition on both surfaces of thick, sclerotic alveolar walls.

-- Author's summary

980 Hypertension Due to Inhaled Submicron Amorphous Silica. G.W.H. Schepers.
Toxicol. Appl. Pharmacol. 1, 487-500 (Sept. 1959).

In laboratory studies with rabbits, the inhalation of a synthetic amorphous silica of 200A* particle size range provoked elevation of the right and left ventricular pressures of the heart. The magnitude of the response was proportional to the dosage of silica administered, the rate, and the duration of exposure. These cardiac pressure elevations were partially reversible on cessation of dust exposure. There were also concomitant radiographic changes, electrocardiographic deviations, modifications of lung functions, hematologic, and electrolytic disturbances. Autopsy findings indicated cor pulmonale, congestive cardiac failure, emphysema, and chemical pneumonitis as the chief responses.

-- APCA Absts.

- 981 On a Case of Rapidly Evolving Silicosis. B. Milijic and Vida Miletic.
Med. lavoro 50, 679-682 (Nov. 1959). Italian.

A case is reported of rapidly evolving silicosis in a 25-year-old worker who was employed for 13 months in the digging of a tunnel for the Mavrovo hydroelectric power station, in the People's Republic of Macedonia. The tunneling was performed by the dry process with no protective measures and it produced a great amount of dust. The rapidity of the onset and the further course of the disease can be explained by the massive inhalation of silica and by a pre-disposition to the disease. Such predisposition may be due either to a deficient pulmonary auto-depuration or to a particular state of immunological hyperreactivity of the subject as was shown in this case by the behavior of serum proteins. It is concluded that detailed periodical controls with clinical and laboratory investigations of the workers exposed to silicosis hazards may be very useful.

-- Cond. from Bull. Hyg.

- 982 Asbestosis and Lung Carcinoma. 1. I. A. Böhme.
Arch. Gewerbepathol. Gewerbehyg. 17, 384-395 (1959). German.

Previous reports in the literature of a lung carcinoma associated with an asbestosis condition, are reviewed and the results collected in a table in the text. Of a total of 894 tissue specimens examined from cases of known asbestosis, 143 indicated the presence also of lung carcinoma. Using the original groupings, as originally reported, the lung cancer incidence ranged from 15 to 20%. One of these groups is the result of a survey of world literature by Hueper in 1955 where 738 examinations indicated the presence of 143 lung carcinomas or an incidence of 15.5%. It is noted that contained within this latter large grouping are several small ones where the individual reports would indicate an incidence of 31 to 40%. Asbestosis develops slowly following a long period of exposure, and the lung carcinoma appears to make its appearance in the latter part of this period. The author presents detailed case histories of 6 patients from a group of 62, and later 100 asbestosis patients on whom the author and his associates made studies over the period of 1936-1958. In 4 of the 6 patients a lung carcinoma was shown to exist. The interrelationship of the 2 pathological conditions is discussed briefly. The necessity for good pathological differentiations of the 2 conditions is stressed.

-- APCA Absts.

- 983 A Routine Sampler for Detecting Variations in the Emission of Dust and Grit. B. Lees and M. C. Morley. J. Inst. Fuel 33, 90-95 (Feb. 1960).

The Report of the Committee on Air Pollution, 1954, recommended that simpler standard methods of sampling flue gases to determine grit emission should be devised. The sampler described has been developed for routine sampling on a comparative basis. It is extremely simple, yields consistent results and requires only a few minutes per day for routine control. Its application is described for assessing on a routine basis the efficiency of collection of grits by mechanical arrestors and the performance efficiency of electrostatic precipitators on boilers fired with pulverized coal.

-- Public Health Eng. Absts.

- 984 A Study of the Problem of Particle-Size Measurement. H. E. Rose.
Chem. Ingr. Tech. 31, 183-191 (Mar. 1959). German.

The problems of the measurement of the size of particles are considered somewhat in relation to the form and other aspects of the particle, but more especially in relation to particle distribution. The determination of the average-size particles of a dust or powder sample is discussed according to the following methods: gas permeability, light intensity, adsorption in a monomolecular layer, reflection, and bulk density measurements. The methods are considered in detail and several pictures of the various apparatus, or diagrammatic representations of them, are given in the text. Measurement of the particle-size/particle-distribution function is also discussed under headings of screen or sieve analysis, measurement of the velocity of falling bodies, and of particle size in suspension.

-- APCA Absts.

- 985 Discharge Electrodes and Electrostatic Precipitators. J. S. Lagarias.
J. Air Pollution Control Assn. 10, 271-274 (Aug. 1960).

Discharge electrodes are made in many shapes and of different materials depending upon the application involved. Factors which must be considered include the type of dust, operating temperature, corrosion, and ozone generation. The efficiency of a precipitator is shown to depend on the total power input and is especially sensitive to the discharge current. Laboratory and field data verify the use of barbed discharge electrodes to improve precipitator efficiency.

-- Author's summary

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 986 Effects of High and Low Humidity on Heat Exchange of Lightly Clothed Men. P. F. Iampietro and E. R. Buskirk. J. Appl. Physiol. 15, 212 (1960).

Although it is common experience that the sensation of chill seems greater on cold humid days than on days when the air is dry, previous studies on nude subjects conducted by these and other investigators failed to show a significant difference in body heat loss to cold humid air compared with dry air at the same temperature. To test the hypothesis that humidity may exert its affect by altering heat exchange through clothing, the present study repeated the earlier tests using 6 male subjects dressed in cotton garments consisting of socks, underwear, shirt, and trousers, together with low shoes. The resting subjects were exposed for 2 hours at different combinations of air temperatures (50° and 40°F), humidities (100 and 30%), and air movements (10 and less than 1 mph). Rectal temperature, skin temperature, and metabolic rate measured during exposure revealed significant differences in heat loss and heat production related to air temperature and air movement but no influence of humidity on heat exchange could be detected. The authors suggest that the increased sensation of chill on cold, wet days may be related to other climatic factors such as overcast with reduced solar radiation or to alterations in heat balance associated with changes in activity.

-- J. Occ. Med. Absts.

- 987 Is Humidity Important in the Temperature Comfort Range? W. Koch, B. H. Jennings and C. M. Humphreys. J. Am. Soc. Heating, Refrigeration and Air-Conditioning Engrs. 2, 63 (Apr. 1960).

Since 1923 engineers have used the Effective Temperature (E. T.) Scale of Houghten and Yaglou as a guide in designing air-conditioning systems for human comfort. All combinations of air temperature, humidity, and air movement which produce an immediate thermal sensation equivalent to that of a reference environment in which the air is 100% saturated and without movement are said to have the same E. T., which is defined as the air temperature of the reference environment. In general, the lower the humidity the higher is the air temperature required to give the same E. T. For some years, however, there have been indications that the normal scale of E. T. overemphasizes the role of humidity in the comfort zone. This paper provides experimental support for this view. Groups of young adult male and female subjects sitting quietly in light clothing were exposed for periods of 3 3/4 hours to different combinations of dry and wet bulb temperature at air movements less than 20 fpm. Each half-hour, subjective reactions to the thermal environment were recorded on a 7-point scale, 4 representing comfort. Attainment of thermal equilibrium required up to 3 hours. Plotted on linear coordinates of dry and wet bulb temperature, the regression line for group mean scores for optimum comfort was a straight line extending from 77.6°F dry bulb at 30% relative humidity to 76.5°F at 85% relative humidity. By contrast, the E. T. line for 71° requires a change of 7.7° dry bulb for the same humidity range. The larger influence of humidity on the immediate sensory response on which the E. T. scale is based is believed to result from humidity effects on heat absorption or loss from clothing fabrics. These effects are transient and disappear during prolonged exposure.

-- Cond. from J. Occ. Med. Absts.

- 988 Trauma and Vascular Diseases Arising from Cold Injury. H. E. Tebrock and M. M. Fisher. Ind. Med. & Surg. 29, 334-337 (July 1960).

The authors have reported the relation of cold injury to peripheral vascular disease. They have classified many subgroups of cold injured extremities into one category for simplicity and ease of approach to therapy. They have attempted to give a working basis for the treatment of cold injured extremities. They have indicated that with the proper protective clothing, the incidence of cold injured extremities can be markedly diminished. They have presented working criteria to evaluate effects of cold injury as a factor in the aggravation of pre-existent peripheral vascular disease.

RADIOACTIVITY AND X-RADIATION

- 989 Radiation Necrosis of the Ossicles. J. Gyorkey and F. J. Pollock. A.M.A. Arch. Otolaryngol. 71, 793-796 (May 1960).

The patient presented here was a 17-year-old youth, who complained, in 1958, of progressive hearing loss in the right ear since 1953. In 1951, the patient had received a total dose of 9,900 r to the head for an ependymoblastoma of the floor of the fourth ventricle. It has been previously shown that radiation of bone over a long period causes vascular changes. The vascular supply of the long process of the incus is known to be fairly meager. The hearing loss that developed was of a conductive type, consistent with interruption of the ossicular chain or fixation of the strapes. Surgical exploration revealed that the long process of the lenticular process of the incus were replaced by a fibrous band. This could have been the end-result of an aseptic necrosis due to the radiation effect on the vascular supply of the long process of the incus. Hearing was restored to a useful level in the speech frequencies by means of a myringo-stapediopexy. Disappearance of the long process and lenticular process of the incus has been found at surgery in the presence of chronic otitis media, with or without the formation of cholesteatoma. The absence of these processes has been also reported many years after a skull fracture with injury of the temporal bone; and congenital malformation of the ossicles frequently has been recorded in the literature. However, destruction of the incus due to massive radiation has not been previously reported.

-- J. Am. Med. Assn. Absts.

- 990 Radioisotopes in Science and Industry. Atomic Energy Commission. 188 pp. (Jan. 1960). For sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C. \$1.25.

The contributions of radioisotopes to the sciences, agriculture, medicine, and industry are reviewed briefly. Separate chapters deal with the progress of research in agriculture and other biological fields; the applications of radioisotopes and radiation to medical diagnosis and therapy; the benefits of isotopes in chemical and physical research; examples of existing industrial uses; some problems of industrial development and studies aimed at solving them for broad segments of the economy; the potential of high-intensity radiation in industrial processes; the training program that assists broader uses of radioisotopes; trends in isotope production, distribution, and pricing; and safeguards to health and safety in the use of radioisotopes and radiation.

-- Nuclear Sci. Absts.

- 991 Some Problems Regarding Permissible Doses with Radioactive Isotopes. Edith H. Quimby. J. Nuclear Med. 1, 14-22 (Jan. 1960).

It is pointed out that for any particular situation it is necessary to weigh the expected good against the feared harm and come to a decision. This is also true of radiation risk. There is no doubt that x-rays and radioactive materials have made marked contributions to our health

and well-being and it would be unthinkable for medicine to dispense with them. It is true that their use carries its quota of hazards for some individuals and in comparison with the gains the risks are difficult to evaluate on a cause and effect basis. Permissible radiation dose levels have been set for radiation workers and for the general population. Permissible doses with radioactive isotopes are discussed.

-- Nuclear Sci. Absts.

- 992 Monitoring for Airborne Radioactive Materials at Hanford Atomic Products Operation.
J. K. Soldat. J. Air Pollution Control Assn. 10, 265-270 (Aug. 1960).

The air monitoring program at Hanford employs a variety of equipment and techniques for measurement of airborne and deposited radioactive materials. Some of the instruments used were developed at Hanford for specific applications. The measurements made are complicated by the presence of naturally occurring radioactive materials and of radioactive fission products from nuclear detonations. Present methods are adequate to ensure that exposures of humans and grazing animals to airborne or deposited radioisotopes are well below applicable limits; however, refinements in air monitoring techniques are constantly being made.

-- Author's summary

- 993 Nuclear Waste Disposal by Fluidized Calcination of Simulated Aluminum-Type Wastes.
J. D. Jackson, et al. Ind. Eng. Chem. 52, 795-798 (Sept. 1960).

Radioactive wastes have become a major concern of the nuclear engineering field. The calcination of the fluid waste material in a fluidized bed reactor has been tested. The present paper reports some of the fundamental kinetics of such a system. A comparison is made between fixed and fluidized bed results. The zero-order decomposition is so fast at operating temperatures that physical factors, such as heat transfer, are controlled. Thus, the fluid bed design can be based upon known methods for heat balance and heat transfer.

-- I. E. C. Brief

- 994 The Role of the Public Health Laboratory in Radiological Science. F. W. Gilcreas and G. B. Morgan. Am. J. Public Health 50, 619-626 (May 1960).

The hazards concerned with increasing uses of radioactivity and radioactive compounds make it essential that every public health laboratory, not excluding those concerned directly with water and sewage treatment operations, be prepared and equipped to make the necessary measurements of radioactivity in the environment. This requires the acquisition of new equipment and laboratory facilities, the training of specialized personnel, and the unavoidable increases in budgets. For the purpose a complete monitoring survey with sampling of air, water, sewage, and related materials is necessary and should be strategically located relative to possible present and future sources of radioactive contamination. Such a survey conducted at the University of Florida is described in detail including the facilities available and the techniques used in the radiation measurements. A major function of such surveys is the accumulation of data relative to normal background concentrations of radioactivity. With such data available the significance of any radioactive pollution of the environment can be assessed. Much can be accomplished with minimum facilities and equipment, but as the uses of nuclear operations increase more complex equipment, added personnel, and greater scientific skill will be required. The interpretation of the results of measurements of radioactivity is difficult and requires a broad knowledge and training in nuclear science.

-- Authors' summary

- 995 Chemical Protection from Radiation Effects. D. R. Kalkwarf.
Nucleonics 18, 76-81; 130-131 (May 1960).

The effectiveness of chemicals in reducing radiation damage was investigated. Hypothetical and confirmed mechanisms which increase or decrease radiation effects are: energy and charge transfer from an excited molecule to an additive molecule; scavenging additives reacting with decomposition products from molecules; and complex-forming additives, the product of which is more or less susceptible to radiation than the original substance. Cysteine was one

of the first compounds reported to protect living systems. The thiol and amine groups of this molecule have been the focus of much interest. It has been pointed out that beta-substituted ethylamine groups are common to a number of good protective agents in mice. The protective action of aminoalkylisothiuronium salts depends on their ability to rearrange into the corresponding mercaptoalkylguanidines in which a thiol ($-SH$) group is exposed. These compounds increase the mean longevity of animals, prevent induction of leukemia, and protect against death; they do not prevent nephrosclerosis, loss of fur color, or cataract formation. Cysteamine protects animals from death following an acute radiation dose but does not protect against genetic damage or sterility. Some of the most active industrial investigations of chemical protection have been on lubricants for nuclear-powered equipment. Chemical protection was investigated for decreasing the radiation effects on elastomers and plastics, glass, ion-exchange resins, the sterilization of food and medicinal products, and radiation-induced reaction products.

-- Cond. from Nuclear Sci. Absts.

- 996 Medical Reactors. A Review of U.S. Program. Anon.
Nuclear Eng. 5, 205-209 (May 1960).

A survey of the medical and biological research program of the United States Atomic Energy Commission is presented. The various applications of irradiation and radioisotopes in medicine are briefly described, and the subject of medical research reactors is discussed. Such reactors presently operating in the United States, e.g., at Los Angeles, Massachusetts Institute of Technology, Washington, Brookhaven, and Oak Ridge, are described.

-- Nuclear Sci. Absts.

- 997 Radiation Protection Standards. L. S. Taylor. Radiology 74, 824-831 (May 1960).

A review is presented of criteria for radiation protection standards. Permissible dose levels are discussed.

-- Nuclear Sci. Absts.

- 998 The Influence of Radiation on Recovery. J. B. Hartgering.
Military Med. 123, 210-215 (Sept. 1959).

The radiation component of nuclear weapons introduces a new type of injury with which there has been no previous battlefield experience. All recent operations analyses have emphasized that ionizing radiation will be the most important primary and complicating cause of military casualties in the event of nuclear war. Some of the implications of radiation on the clinical course and medical management of familiar injuries and diseases are discussed. The need is stressed for research on the clinical aspects of the combined effects of radiation and injury. The interest of the military in time of war will not be in whether or not the combination reacts synergistically with doubling or tripling sensitivity, but how these effects can be modified to protect more individuals and return more men rapidly to the combat command.

-- Nuclear Sci. Absts.

- 999 Fallout—One of Several Sources of Radiation Exposure to the Total Population. C. L. Dunham.
J. Nuclear Med. 1, 50-55 (Jan. 1960).

The biological consequences of radioactive fallout from nuclear weapons tests are discussed. It is pointed out that actual data are practically non-existent on the effects in humans of radiation exposures involving the low total doses and low dose rates associated with present levels of fallout. Any exposure to radiation may be assumed to involve some degree of risk and is therefore undesirable unless there is adequate reason for the exposure. Standards for the evaluation of risk from fallout are discussed.

-- Nuclear Sci. Absts.

03120643

- 1000 A Comparison of the Composition of Reactor Waste Solutions and Radioactive Fallout. W. J. Lacy. *Am. Ind. Hyg. Assn. J.* 21, 334-339 (Aug. 1960).

Both fallout and power reactor wastes constitute hazards to the population. All radiation is damaging, however, the relative danger will depend on the length of time and level of exposure. Hazards due to radiation and chemical toxicity in a chemical processing plant under conditions of normal operation can be controlled. General radiation levels for radioactive fuel processing equipment can be reduced with proper shields. Ingestion and inhalation of radioactive material either reactor-produced or from the fallout of a nuclear detonation may be detected and controlled. The major biological hazards in the reactor waste after a 30-year accumulation period and a 5-year decay following accumulation, are the fission products in the following order: Sr^{90} , Cs^{137} , Ce^{144} , and Pm^{147} . All these radionuclides are also formed in a nuclear detonation and are the most hazardous of the long half-life fission products in fallout, as well as in reactor waste. Chemically, both qualitatively and quantitatively, the accompanying or carrier material usually is a different compound. This is the type of complicated, diversified problem involving many fields of science that members of the American Industrial Hygiene Association have been dealing with and will continue to be challenged with for some time to come.

-- Author's summary

- 1001 Method for Photographic Identification of Microscopic Radioactive Particles. J. Sisefsky. *Brit. J. Appl. Phys.* 10, 526-529 (Dec. 1959).

A method is described for identification and microscopy of small radioactive particles mixed with a large amount of inactive ones. The particles are prepared on a celluloid coating on a glass plate. The plate is coated with a nuclear emulsion in gel form which is reversal developed *in situ* leaving the active particles visible, in the centers of clear circular spots against a brown transparent background.

-- Bull. Hyg.

ENVIRONMENTAL MEASUREMENTS

- 1002 Instruments for Air Pollution. R. L. Swift. *Air Engineering* 2, 27-30 (Jan. 1960).

The author presents a round-up of modern instruments used in air pollution control and for the fast detection and measurement of contaminants from industrial processes. Instruments are divided into 2 groups, collection devices and indicating devices. The electrostatic precipitator, electrostatic sampler, fixed flow air sampler, cascade impactor and thermal precipitator are collection instruments which can be employed to collect samples of airborne dusts and aerosols for analysis and identification. A portable hand operated midget impinger may be used for dust sampling in any location. It is also used for dust survey work and by industrial plants for in-plant sampling. Direct measuring instruments are of 3 categories: Glass Tube Detectors; Filter Reagent Samplers; and Hot-Wire Catalytic Combustible Gas Indicators; these are adaptable for general industrial testing. Tube type detectors are those in which the gas of interest reacts with a chemically impregnated gel to give either a length of stain or color change. The tubes are sensitive to carbon monoxide concentrations from 0.001 to 0.10% by volume. Stain type detectors are made for hydrogen sulfide, chlorine, mercury vapor, halogenated hydrocarbons, nitrogen dioxide and others.

-- Public Health Eng. Absts.

- 1003 Developments in the Use of the A.I.S.I. Automatic Smoke Sampler. J. C. Park, D. M. Keagy and W. W. Stalker. *J. Air Pollution Control Assn.* 10, 303-306 (Aug. 1960).

Eleven American Iron and Steel Institute (A.I.S.I.) automatic smoke samplers are in continuous and simultaneous operation as part of a year-long Public Health Service field study in Nashville, Tennessee. The heavy load of reading so many tapes prompted the development

of an automatic spot evaluator which can read approximately 12 samples per minute. Tests revealed that the flow rate varied significantly between samplers and between filter tape rolls, and that the flow rate decreased at a predictable rate during the sampling cycle. The variation in flow rate of areas within the roll was not significant for the tape used in this study. An A.I.S.I. sampler calibration procedure was developed which is both simpler and more accurate than previous procedures.

-- Authors' summary

- 1004 Development of a Freeze-Out Technique and Constant Sampling Rate for the Portable Uni-Jet Air Sampler. A. L. Lynch and R. C. Charsha. Am. Ind. Hyg. Assn. J. 21, 325-329 (Aug. 1960).

The Uni-Jet Air Sampler was adapted to the freeze-out technique for collecting micro concentrations of air contaminants having a wide range of volatilities. A small wide mouth vacuum flask was used to contain the coolant. The collection efficiencies for 1 to 5 ppm of nitrobenzene in air were 85% to 95% at -21°F. and -116°F. Under similar conditions, the collection of carbon bisulfide required liquid nitrogen temperature, -321°F, to reach an efficiency of 85 to 90%. The midget impinger was modified by reversing the flow and adding 3 mm. glass beads to increase condensation surfaces. The entire sampling unit is small enough to be held in one hand, and easily portable for field work. Volatile scrubbing solutions may be cooled below ambient temperature by vaporizing liquid Freon-12 in a coil surrounding the midget impinger, and connected to the aspirator of the Uni-Jet Air Sampler. Flow control of liquid Freon-12 into the coil by a standard refrigerator valve will produce a constant aspirator vacuum, and the effect of a variable aspirator orifice. The air flow through a standard midget impinger can be maintained at peak efficiency of 0.1 cubic foot per minute for 97% of the time required for expansion of a one-pound charge of Freon-12. The maximum constant flow through a Greenberg-Smith impinger was 0.33 cubic foot per minute while 98% of the propellant was consumed. Rates as low as 20 ml. per minute at near zero flow resistance were attained.

-- Authors' summary

- 1005 Air Flow Calibration of Direct Reading Colorimetric Gas Detecting Devices. H. L. Kusnetz. Am. Ind. Hyg. Assn. J. 21, 340-341 (Aug. 1960).

The necessity for checking carefully the air flow characteristics of direct reading colorimetric gas detecting devices has been shown. Construction of a simple buret using a soap bubble as the indicating medium has been described. Such a device could be made part of field equipment.

-- Author's summary

- 1006 The Determination of Organic Vapors in Air by Gas Chromatography Using a Direct Injection Method. B. Levadie. Am. Ind. Hyg. Assn. J. 21, 322-324 (Aug. 1960).

The polyethylene glycol 400 column offers a practical solution to the annoying problem of moisture in the chromatography of airborne vapors. It permits the application of direct injection of the sample into the column and thus expand the usefulness of this type of analysis for the industrial hygienist. This technique is simple. With a set of standards prepared directly from the solvents themselves, the need for test tank standardization of the chromatograph is eliminated. By changing the operating conditions of the column, perhaps by modifying it, the sensitivity of this method possibly can be developed to detect much lower levels of traces than the author has shown, without the need of resorting to costly detection systems and complicated sampling arrangements.

-- Author's conclusions

- 1007 A Mass Loading and Radioactivity Analyzer for Atmospheric Particulates. J. S. Nader and D. R. Allen. Am. Ind. Hyg. Assn. J. 21, 300-307 (Aug. 1960).

A prototype mass loading and radioactivity analyzer for atmospheric particulates was developed. Beta gauge technique using carbon-14 is applied to measurement of the thickness of particulate deposits collected on membrane tape. This technique for mass loading

analysis is also applicable to paper tape and other media of comparable thickness. The result is expressed in terms of concentration values, i.e., micrograms of particulate per cubic meter of air (micrograms/cu.m.). The proportional counter in the instrument also measures the alpha and beta radioactivity content of the dust deposit and the concentration values are in terms of micro-microcuries of activity per cubic meter of air (micro-microcuries/cu.m.). Preliminary indications are that mass loading analysis can be made of particulate concentrations within 100 micrograms /cu.m. but additional empirical data will be required to assess the effect of combined errors before the limit of sensitivity can be established. Concentrations of natural radioactivity by alpha detection can be measured as low as 35 micro-microcuries/cu.m., and artificial radioactivity concentrations by beta detection at 18 micro-microcuries/cu.m., both values being well within recommended maximum permissible levels in air. Present semi-automatic operation of the instrument permits rapid analyses of a series of samples on tape. Work is currently underway on indicated improvements to increase the sensitivity of the instrument and automatically record the data as the analysis is performed.

-- Authors' summary

- 1008 Odor Determination Techniques for Air Pollution Control. C. W. Gruber, G. A. Jutze, and N. A. Huey. J. Air Pollution Control Assn. 10, 327-330 (Aug. 1960).

The physiology of the olfactory sense is a biologic mystery and therefore leaves much to be learned concerning the nature of odors. Due to this lack of knowledge, inanimate instrumentation for measurement of odor, per se, has not been conceived. Present inanimate instrumentation is based on measurements made on the known odorant. These methods are specific for one odor, suffer from lack of sensitivity, and are incapable of handling mixed and unknown odors. Odor strength can be measured organoleptically. These methods suffer from the variations in the ability to smell. Of the present organoleptic measurement devices, the Syringe Technique and the Nader Dilution Apparatus are recommended for measurement of odor strength at the source. For measurements in the affected area of ambient odors, the Flask Dilution Technique and the Scentometer are recommended. For the purpose of source detection of ambient odors and the gathering of proof of the source, triangulation by simple wind direction data is possible. The data must be gathered at the time of 2 different occurrences of the same odor with different wind directions. Odor quality is such a problem, that for the purpose of present progress, it is best ignored.

-- Authors' summary

- 1009 Developments in the Measurement of Atmospheric Sulfur Dioxide. A. F. Welch and J.P. Terry. Am. Ind. Hyg. Assn. J. 21, 316-321 (Aug. 1960).

In the course of an air pollution research study in Nashville, Tennessee, the sodium tetrachloromercurate (TCM) method for collection and analysis of low concentrations of sulfur dioxide was found to be accurate, highly sensitive, flexible, and practical. The adaptation of this method to use with an automatic analytical instrument and methods of rapid midjet bubbler handling, washing, and filling procedures are described. The relationship between this modified TCM method and 2 other methods was investigated, using synthetic mixtures of sulfur dioxide in air. A dynamic calibration procedure showed that Thomas Autometer and the TCM results are identical. The relationship between the hydrogen peroxide and TCM methods was found to be: (hydrogen peroxide results in ppm) = $0.72 \times (\text{TCM results ppm}) + 0.04$. The lead peroxide candle method for estimation of sulfur dioxide as used in Nashville is described.

-- Authors' summary

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PREVENTIVE ENGINEERING

MHBB-0018666

- 1010 New Developments in Sanitizers and Disinfectants. A. Lada.
Soap Chem. Specialties 36, 103-107, 119 (Jan. 1960).

Recent development of antibiotic-resistant strains of staphylococci has led to increased interest in disinfectant compounds. Many proprietary products claim to be "disinfectants" without being able to meet the standards set up under the Economic Poisoning Act, which distinguish sharply between sterilizers, disinfectants, sanitizers and bacteriostats. At present, no chemicals in common use will sterilize inanimate surfaces. Disinfection is the most rigorous claim that can be made for products designed for general use. The U. S. Department of Agriculture has developed a "Use Dilution Confirmation Test", which while having limitations, is now the sole recognized bacteriological test for determining disinfectant levels. Valid claims of disinfectant power cannot be made on the basis of Phenol Coefficients, Germicidal Capacity Tests, Percent Survival or other older criteria. The 4 most widely used classes of germicides are the phenolics, iodophors, quaternary ammonium compounds and the organotin compounds. Advantages and disadvantages of each class are summarized by the author. Quaternary ammonium compounds are especially valuable in that they have cleaning and odor controlling properties in addition to their germiciding action. At 400-600 ppm quaternaries are effective against antibiotic-resistant staphylococci.

-- Public Health Eng. Absts.

- 1011 Air Flow Resistance of Flexible Metal Hose. M. W. First and F. J. Viles, Jr.
Am. Ind. Hyg. Assn. J. 21, 296-299 (Aug. 1960).

The objective of the present investigation was to determine accurate friction values for the several sizes of flexible metal hose commonly used for exhaust ventilation service in machine shops and similar installations. In addition, a correlation between the resistances of equal sizes of corrugated and standard sheet metal duct was sought so that friction charts and tables pertaining to standard sheet metal duct could be used, with suitable correction factors, for estimating the resistance of corrugated metal duct. Measurements of straight runs and elbows of clean 4-, 5- and 6-inch round flexible metal hose indicate that friction losses are somewhat less than for standard round galvanized sheet metal ducts and less than one half those of equal sizes of commonly-used fabric-type flexible hoses.

- 1012 Reduction of Air Pollution by Control of Emission from Automotive Crankcases.
P. A. Bennett, M. W. Jackson, C. K. Murphy and R. A. Randall.
S.A.E. Annual Meeting, Preprint 142A, 30 pp. (Jan. 11-15, 1960).

From the measurements of hydrocarbon concentrations and flow rates, it has been established that crankcase and exhaust hydrocarbon emissions are of the same order of magnitude. Therefore, it must be concluded that crankcase hydrocarbon emission is a major portion of the automobile's contribution to air pollution. Ventilation of the engine crankcase to the intake system eliminated crankcase hydrocarbon emissions without appreciably affecting exhaust emissions. However, a successful internal crankcase ventilation system must be carefully engineered for each engine design with particular regard to carburetion and manifolding. Considering the crankcase and exhaust hydrocarbon emissions under all operating conditions—idle, road load, acceleration, and deceleration—it was estimated that the internal crankcase ventilation system eliminates 40% of the engine hydrocarbon emissions exclusive of carburetor vent losses. Various analyses have led to the conclusion that blowby gases are predominately carbureted mixtures. This indicates that the specific hydrocarbons in the fuel determine the specific hydrocarbons in the crankcase gases. Therefore, in cars in which the crankcase emissions are not controlled, the fuel composition determines the crankcase hydrocarbons emitted.

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Despite the fact that the importance of crankcase emission was only recently recognized, the crankcase has been, and continues to be, a major source of hydrocarbons relative to exhaust. Any control of air pollution from the automobile must be formulated with this fact in mind.

-- Public Health Eng. Absts.

COMMUNITY AIR HYGIENE

- 1013 The Problem of Air Pollution. M. Katz. Can. J. Public Health 51, 1-7 (Jan. 1960).

Federal activities in air pollution research and allied fields which are presently being conducted in Canada include advice and assistance to a number of provincial departments of health regarding various industrial problems, plus the planning of surveys of urban air pollution and the drafting of municipal control regulations. A study of the pollution problem in the Greater Detroit-Windsor area has recently been completed and deals with the extent of contamination of the atmosphere by major land sources and by Great Lakes water traffic. The effects of air pollution on morbidity and mortality rates as well as injury to vegetation were previously investigated in the same area, but no definite conclusions were drawn. Air pollution control in Canada has been progressing since 1952 when a voluntary smoke abatement program was begun concerning Great Lakes vessel traffic. More recently, in 1958, the Air Pollution Control Act conferred broad powers to municipalities regarding the control of air pollution.

-- Public Health Eng. Absts.

- 1014 Conservation of Air Resources. F. Tetzlaff. Public Health Repts. 75, 43-45 (Jan. 1960).

No modern city can hope to be completely free of air pollution and to require industry to establish absolute control of its many by-products could easily impose an economic burden that would be intolerable. In this respect, there is need for health agencies to determine maximum concentrations of pollutants that may be permissible for chronic exposures and apply these standards to the various forms of air pollution that occur, there being no single factor that can be charged with full responsibility for air pollution. In one community, municipal incinerators, power plants, or steel mills may be the offender, in another the burning of garbage, and in another home incinerators and automobile exhaust may be the major offenders. In the United States over one-half the present population of more than 175 million reside in 180 metropolitan areas representing less than 10% of the land area. There is evidence of a relationship between air pollution levels and mortality rates from stomach cancer and lung cancer, with allowance being made for smoking habits. Research in Great Britain shows a direct relationship between air pollution and chronic bronchitis, a serious disease ranking third among causes of death in England and first among causes of economic loss due to illness. The growing concern with air pollution resulted in Federal Legislation authorizing the Public Health Service to conduct programs of research and technical assistance. In the last 10 years more than 20 states have adopted or modified legislation in the air pollution field, and there is an increasing amount of legislative activity observed in many municipalities. -- Public Health Eng. Absts.

- 1015 The Estimation of Air Pollution Emissions in a Regional Air Pollution Control District. W. R. Crouse, et al. J. Air Pollution Control Assn. 10, 285-291 (Aug. 1960).

The total emissions survey provided a comprehensive inventory of the amounts and types of pollutants emitted. These data furnished a basis for the development of regulation in the Bay Area (San Francisco). All air pollution engineers would agree that the ideal way of determining total air pollution emissions within a given area would be to sample every source or at least single representatives of each category of sources. However, time and money never seem to permit this approach. Regardless of how frustrating some of the necessary

compromises might at first appear to the technical man, a valuable survey can be made even in a complex situation that can form the basis of sound decisions for a total air pollution control program. -- Authors' conclusions

- 1016 Injuries Caused to Fruit Trees by Fluorine-Containing Gases. E. Bovay.
Landwirtsch. Jahrb. Schweiz 72, 541-544 (Nov. 1958). French.

Determinations were made of the fluorine and of the chlorine content of the leaves of various fruit trees growing in the vicinity of 2 factories. One factory produced aluminum and released a fluorine-containing gas while the other produced soda ash and released a gas containing chlorine. The aluminum factory was not in operation during 1957 and the fluorine content of the dried leaves barely reached 2.5 mg. %. The content during previous periods of injury had been higher than 10 mg./100 g. of dried leaf matter. No symptoms of burn were seen on the leaves of the fruit trees during 1957. Contrary to the findings on fluorine content, the chlorine concentrations during 1957 showed little change from the usual great variability. During 1957 this range was from 21.3 to 113.0 mg./100 g. The results lead to the conclusion that the damage to the fruit trees of the area was the result of the presence of the fluorine rather than the chlorine gas. This does not rule out the possibility of a synergistic action due to the simultaneous presence of the chlorine, but this would appear to be unlikely. -- APCA Absts.

- 1017 Antiozonants to Protect Plants from Ozone Damage. S. Rich and G. S. Taylor.
Science 132, 150-151 (July 15, 1960).

Manganous 1,2 naphthoquinone-2-oxime protected tomato foliage in the field from damage apparently caused by excessive atmospheric ozone. The compound proved to be a very effective antiozonant. The similar cobaltous and manganous chelates of 8-quinolinol were also effective antiozonants. The materials were applied to cloth of the type used to make field tents for shade-grown tobacco. Tomato plants covered with cloth treated with cobaltous-8-quinolinolate were protected against otherwise damaging concentrations of ozone. These materials and methods may afford a useful way to reduce weather fleck of the tobacco and other plant injuries caused by excessive atmospheric ozone. -- Authors' abst.

- 1018 The Prevention of Air Pollution Damage to Plants by the Use of Vitamin C Sprays.
H. T. Freebairn. J. Air Pollution Control Assn. 10, 314-317 (Aug. 1960).

The evidence presented by the author indicates fairly conclusively that vitamin C applied as a spray moved into the leaf cells of some plants and because of its presence increased the tolerance of the cells to the damaging agents in smog. The protection afforded by vitamin C in the laboratory from ozone and in the field from air pollutants implied that either ozone was a damaging agent in the field or that vitamin C was effective against other toxic agents in the field. Of course both possibilities could have been occurring together. It is interesting that in some instances complete protection was obtained, but in most of the cases only partial protection resulted. This could serve as suggestive evidence that more than one group of toxic agents were present in the polluted air and vitamin C was only effective against one particular group of these toxic agents (the oxidants seem to be the most reasonable group for vitamin C action). It would not be expected, for instance, that vitamin C would be effective against pollutants such as ethylene. Another consideration which probably was important was the relationship between the concentration of the toxicants in smog and the amount of vitamin C in the plant cells. High concentrations of toxicants would presumably damage the cells in spite of the presence of increased amounts of the vitamin because the vitamin increases were small in comparison to the increased smog. Different plants absorb vitamin C at widely varying rates and also differ in their susceptibility to smog poisons. This possibly accounts for the fact that spinach was not protected while romaine lettuce was. Both of these plant types grown in the same field, received the same vitamin treatment and were exposed for about the same time to the polluted air. -- Author's conclusions

- 1019 The Role of the Public Health Laboratory in Air Pollution Programs. H. L. Helwig and J. A. Maga. Am. J. Public Health 50, 933-936 (July 1960).

The role of the public health laboratory in an air pollution program is dependent upon the program responsibility of the department of public health. In the dynamic field of air pollution, these responsibilities are continually changing to meet new needs and to apply the new research findings. In nearly 4 years of activity, the Air Industrial Hygiene Laboratory of California State Department of Public Health has developed its contribution in the areas of laboratory support of programs of air pollution measurement, development of laboratory methods of analysis and epidemiological applications, research on the chemical and physical nature of air pollutants, and the relating of results of research on air pollution to the program of the department.

-- Authors' summary

- 1020 Regulation of Refuse Incinerator Design by Public Agencies. G. H. Abplanalp and J. W. Stephenson. Am. J. Public Health 50, 1155-1162 (Aug. 1960).

Most satisfactory and nuisance-free incinerator operation can be assured by close state control of design, based on sound established criteria. By contrast, state approval of design may be of little value when not based on such criteria. Appended to this paper is a brief summary of items recommended by the authors for inclusion in state design standards. Considering the public health aspects of refuse disposal, the authors believe that it must come under the jurisdiction of public agencies. Most logical and most effective would undoubtedly be control by state health departments in a manner comparable to present control of water and sewage treatment.

-- Authors' summary

- 1021 Stokers for Incinerators—New Trend to Traveling Grates. J. H. D. Blanke. Power Eng. 64, 82-83 (Feb. 1960).

This article discusses three types of mechanical grates designed to increase the efficiency of incinerators for refuse burning. One consists of an inclined endless belt type grate which receives raw refuse for drying and discharges the dried material to a horizontal endless belt type grate for burning. Both New York and Philadelphia have installed incinerators using traveling grates of this type. To achieve maximum incineration of refuse, the burning stoker is made longer than the drying stoker with the speed of the latter less than that of the former to obtain a thinner layer of material on the burning grate. Burning rate is better than 70 lbs. of refuse per hour per square foot of the combined effective grate area of both the drying and the burning grates. The second type of moving grate is the inclined rocking grate stoker. Progressive burning of wastes is affected by upward movement of alternate hydraulically actuated stoker bars. This stoker has found wide acceptance by municipalities, institutions and industries. This type stoker may be installed in tandem, the first unit serving as a drying grate and the second as a burning grate. The third type of grate is installed in a vertical cylindrical furnace with either top or side charge. These stokers are either of the revolving cone or tuyere type. Large installations of these types have been constructed in Miami, Florida, and Hempstead, New York. The Hempstead installation utilizes the heat generated from refuse combustion to produce 120,000 lbs. of steam per day.

-- Public Health Eng. Absts.

- 1022 The Oxidation of Hydrocarbons on Simple Oxide Catalysts. K. C. Stein, et al. J. Air Pollution Control Assn. 10, 275-281 (Aug. 1960).

Recently a large number of catalysts have been tested for the oxidation of various hydrocarbons at the Bureau of Mines Laboratories for the purpose of developing catalysts which may be suitable for oxidizing hydrocarbons in automobile exhaust gas. In summary, the following statements may be made: (1) Branched hydrocarbons are more difficult to oxidize than normal hydrocarbons. (2) Ease of oxidation increases with molecular weight in homologous series. (3) Unsaturated aliphatic hydrocarbons are more easily oxidized than the corresponding paraffins, and susceptibility to oxidation increases with increasing saturation. For example, acetylenes are more reactive than olefins. (4) In comparing open chain and

cyclic compounds having the same number of carbon atoms, reactivity toward oxidation probably decreases according to the sequence. (5) The most active single oxide catalysts were found to be the oxides of cobalt, nickel, manganese, chromium, cerium, titanium, and iron. It is conceivable that different forms or preparations of the same oxide would have different activities. Impregnating these oxides on various supports may also produce large changes in activity. (6) The microcatalytic-chromatographic technique has proved to be a very convenient means for rapid screening in oxidation studies. It is to be recommended where a large number of catalysts or reactants are to be investigated or where a wide range of temperatures is to be used

-- Authors' summary

- 1023 Obnoxious Odors. A. Turk. Ind. Wastes 4, 140-145 (Sept. 1959).

Air pollution may manifest itself in particulate matter, chemical effects or noxious odors. When the elimination or control of odors is the principal aim of air pollution control, the problem involved is primarily one of abatement of gases and vapors and the ultimate goal is the reduction of atmospheric concentrations of these materials below the odor threshold concentration. Since odor threshold concentrations are usually several orders lower than those of toxicity, irritation and plant damage, odor control usually involves concentrations which are fairly low but still require further reduction by efficient methods of removal. Among these methods of removal are: combustion, adsorption, absorption and modification. The limitations and applications of each are described.

-- Author's summary

- 1024 Chronic Bronchitis: An Approach to the Problem of Prevention Together with an Assessment of the Health and Social Cost. J. L. Burn. Public Health (London) 74, 131-138 (Jan. 1960).

The figures for deaths from bronchitis of all forms in England and Wales for 1953-1957 and provisionally for 1958 and 1959, are in the range of 26,000 to 30,000, with those for chronic bronchitis being 20,000 to 24,000. It appears to be a peculiarly "English" disease since the death rate would seem to be 3 times that of Belgium, 6 of Germany, 10 of France, 20-30 of Scandinavia, and 36 of the United States. Despite the many fallacies inherent in the international comparisons, such as assignment of death to heart disease or pneumonia instead of bronchitis, the total is still very high. In England and Wales the mortality from bronchitis of males is twice that of females. In a chart relating deaths to social and occupational factors in 5 groupings, the mortality rate in the unskilled workers of the lowest group was 5 times that of the top group composed of managerial and professional personnel. It was noted that the incidence of morbidity and mortality was decidedly increased for those engaged in unhealthy occupations, such as dusty ones or heavy manual labor, particularly in an industrial urban area. Other chronic respiratory diseases, such as lung cancer, pneumonia, and tuberculosis, show an increase in the death rates from rural to urban areas but the gradient is not as steep as that of bronchitis. Among the unsolved problems in this complex disease is to be considered the relative importance of a long list of possible causative factors including air pollution. Health education methods are needed to warn people with chronic bronchitis to keep indoors and to keep warm in times of smog.

-- Cond. from APCA Absts.

- 1025 Cancer of the Lung—A Public Health Problem? J. Cuthbert. Public Health (London) 74, 123-130 (Jan. 1960).

The diagnosis, treatment, and prognosis of lung cancer are discussed in detail. Apart from an aging trend in the population there appears to be 2 main causative factors, those of tobacco smoking and of air pollution. The smoking habit is widespread in the British Isles, yet the cancer rate is definitely higher in the large industrial cities than it is in rural areas. The chronic bronchitis rate is also higher in those cities. Therefore, air pollution is considered an etiological factor in lung cancer although the dangers from the atmosphere are not as clearly defined as those from smoking. Motor traffic is another potent factor in air pollution and eventually the question of exhaust fumes will have to be faced. In highly industrialized cities as much as 300 tons of deposited matter is found per square mile annually while in rural areas the figure is 50 tons or less. Sulfur dioxide seems to be the pollutant which

aggravates bronchitis and as fuel oil contains 5 or 6 times the sulfur content of coal, one must avoid falling into the pitfall of substituting oil heating for coal burning. Domestic smoke, like cigarette smoke, contains di-benzanthracene and benzpyrene and the amount of the latter has been noted to be 8 to 11 times greater in the air of Liverpool than it is in some rural districts of England.

-- Cond. from APCA Absts.

MANAGEMENT ASPECTS

- 1026 Retirement from the Viewpoint of a Medical Director. W. P. Shepard.
Ind. Med. & Surg. 29, 309-314 (July 1960).

The author discusses the subject under the following topics: Retirement Versus Health and Happiness, Need for an Impersonal Retirement Plan, Financial Structure of Impersonal Retirement Plans, and Preparation for Retirement—Economics, Health, Interests. The author states that in addition to hobbies the retiree might well take an interest in politics where his mature judgment and years of experience can serve his city, state and nation. His participation in all forms of civic enterprise is useful, satisfying and welcome. When the young or middle-aged worker can be persuaded that retirement is inevitable and that it should be intelligently and continuously planned for by attention to income, to health and to outside interests, compulsory retirement then becomes a fiction. Retirement is then voluntary.

- 1027 The Alcoholic and His Community Search for Help. Genevieve Burton.
Am. J. Public Health 50, 980-988 (July 1960).

One point should be made clear about the alcoholic and his search for help in the community. The alcoholic's needs and apprehensions about receiving help with a personal problem are not different in nature from the needs and apprehensions of anyone else; they may, however, be much greater in intensity. Also, his problem almost inevitably is not a single problem but a complex constellations of problems. Thus, if a nonalcoholic with an emotional problem feels anxious and inadequate when he seeks help, the alcoholic by virtue of the nature of his illness feels more so. If the nonalcoholic counselee is distrustful of, and afraid of not being accepted by the counselor the alcoholic is more so. Except for this varying degree of intensity of need, the approach of the "helping" person to the alcoholic does not differ from the desirable approach to anyone else. The alcoholic, especially, will become threatened and will withdraw if he senses rejection. The essence of the feelings expressed by this particular group of alcoholics and their wives about their attempts to find help in the community indicates in a limited way the direction work with alcoholics must take. Since alcoholism is not a delimited disease entity, but a problem intertangled with many other problems, there can be no one community agency alone whose responsibility or prerogative it is to work with the alcoholic. It is hoped that the experience of one agency, as described by the author, may suggest to agencies in other communities how they may contribute to the control of the growing and devastating public health problem of alcoholism.

- 1028 The Significance of Current Research in Alcohol Metabolism. I. R. Tabershaw.
Arch. Environmental Health 1, 248-252 (Sept. 1960).

From a research viewpoint, the alcohol question presents a paradoxical picture. On the one hand, alcoholism is considered to be one of our major public health problems. Yet, at the same time, the technological resources actually being utilized to attack this problem are relatively small. The underlying reasons for this attitude toward alcohol metabolic research stems from a complex of causes. There is certainly a heavy overlay of dogma and temperance prejudice suggesting that alcohol is not exactly a respectable subject for serious investigators

to study. The distillers themselves are deeply interested in many aspects of alcohol primarily as a beverage and not as a drug. It is hoped, however, that in view of the increasing technological resources which one can now bring to bear on this problem definitive answers will be forthcoming and a real solution to the problem of alcoholism will be found.

- 1029 The Work Performance of Epileptics in Industry. M. M. Udel.
Arch. Environmental Health 1, 257-264 (Sept. 1960).

Data presented indicate that the group of epileptics studied are capable of normal work performance as hypothesized. It is recognized that the sample was too small and that an inherent bias existed in this group, as described, so that it is not possible to make the same claim for all epileptics. In this group satisfactory work was demonstrated, by the criteria suggested, even though only 12 cases were known to have achieved clinical control of seizures. On the basis of these observations it appears reasonable to conclude the following: (1) Discriminatory practices against hiring epileptics are unwarranted if based on the general notion that epileptics as a group have high accident rates, poor absence records, and low production efficiency. (2) Any applicant with epilepsy must be appraised individually as to his capacity for employment and the degree of his impairment for proper placement or rejection. (3) The relevant host factors in appraising an epileptic are the degree of seizure control and the type of associated defect where present. (4) Since most epileptics will deny seizures when applying for employment, it is perhaps better to have a receptive policy for hiring and job security. This may encourage cases to admit the problem and permit industry an opportunity to appraise and place them more effectively. (5) Perhaps the industrial physician should take a more active role in supervising the epileptic employee through achievement and maintenance of seizure control, since there is clinical evidence that 75% of epileptics can have control, thus removing attacks as a barrier to employment.

-- Author's conclusions

ACCIDENTS AND PREVENTION

- 1030 Safety in the Use of Abrasive Wheels. Ministry of Labour & National Service. H. M. Factory Inspectorate. Safety, Health & Welfare, n.s. No. 4. H.M. Stationery Office, London. 64 pp. (Aug. 1959). 4s.

This booklet is intended to advise on precautions for the prevention of accidents in the use of abrasive wheels. The risk of breakage is inherent in every such wheel, and if the frequency of breakage is to be kept low the initial care exercised by the makers of wheels and machines must be coupled with the adoption of sound safety measures by the users. The booklet deals with the risk of injury resulting from wheel breakage, contact with the running wheel, and projection of the work. Under the heading Protection Against Bursts the importance of wheel guards is stressed. These should always be used: (1) to contain the wheel parts in the event of a burst; (2) to protect the wheel against inadvertent damage; (3) to prevent as far as possible, the operator coming into contact with the wheel; and (4) to prevent an over-size wheel being fitted. Another section on the operation of abrasive wheels gives advice on the truing and dressing of wheels, wheel balance, grinding solutions, protection of the eyes, and the grinding of magnesium alloys. Further sections of the booklet deal with portable grinders, mounted wheels and points, and abrasive cutting-off wheels; and there is a useful summary of operating precautions.

-- Cond. from Bull. Hyg.

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- 1031 Extinguishing Agents for Combustible Metals and Special Chemicals. E. D. Zeratsky.
Safety Maintenance 120, 28-30, 32 (Aug. 1960).

The ever increasing use of combustible metals and special hazardous chemicals has led to the development of many dry powder and dry chemical extinguishing agents. It may be well to explain the difference between a "dry powder" and a "dry chemical". The term "dry powder" applies to an extinguishing agent which is suitable for use on combustible metals. The term "dry chemical" applies to an extinguishing agent which is suitable for use on flammable liquids and electrical fires. A dry chemical can in some cases be used on a combustible metal fire, but a dry powder is generally not used on flammable liquids. The author briefly discusses the uses and applications of commercially available dry powders in combating fires of magnesium, uranium, titanium, zirconium, sodium, potassium, and lithium. Outside the field of combustible metals, pyrophoric liquids are now presenting a new fire hazard. These liquids ignite spontaneously and the resulting fires can be extinguished, in some cases, only by agents that do not contain water. An example of a pyrophoric liquid presently existing as a special hazard in industry and elsewhere is triethylaluminum. Most ordinary fire extinguishing agents are ineffective against triethylaluminum fires. However, a special dry chemical was developed for this purpose. This material is a mixture of a bicarbonate base dry chemical and an activated adsorbent. Its flow characteristics are such that it can be discharged effectively from ordinary dry chemical extinguishers. The extinguishing action of this special dry chemical differs from that of the graphite base dry powder in that the initial application extinguishes the flame. Continued application adsorbs the remaining fuel and prevents re-ignition.

- 1032 A New Look at Electrical Grounding. W. E. Mesh.
Natl. Safety News 82, 20-21, 101-102, 104, 106 (Aug. 1960).

A puzzling problem in industry is to determine the most effective way to ground electrical equipment to protect personnel from electrical shock. The National Electrical Code (NEC) has explicit rules in certain areas, such as grounding of permanently installed motor frames and electrical services. It does not, nor was it intended to, cover such situations as laboratory bench setups and production test setups. Industry, in general, has followed code recommendations such as using 3-wire cords, plugs, and receptacles to provide an equipment ground connection. In some instances, "grounding everything in sight" has resulted, without too much thought on whether or not new problems were being created. The normal practice of grounding such devices as electric drills by a 3-conductor cord constitutes safe practice when conditions are ideal. Too often, conditions are not ideal and these faults arise: (1) The grounding conductor is incorrectly connected, or not connected at all. (2) Insulation between the 120-volt wire and the motor frame deteriorates or becomes wet, impressing 120 volts on the hand-held frame. (3) Circuit breakers are slow in tripping when a fault does occur, because in many cases they are selected to be as trouble-free as possible rather than selected to trip as close to instantaneous as is practical. To ensure personnel safety when using electrical equipment such as drill presses, and machine tools, these should be periodically checked to see that the frame is properly grounded to meet NEC requirements. Tests should also check polarity of wiring, insulation resistance, ground conductor resistance, plus a visual inspection of electrical switches and control boxes. Low voltage or air driven appliances should be used in wet locations. Isolation transformers are helpful in some specific conditions. The total environment must be considered in each case to determine the safest way to approach a specific problem.

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MISCELLANEOUS

MWBB-0018674

- 1033 Copper and Brass Tube Mill Wastes Treatment. J. S. Bethel, Jr., C. N. Sawyer and C. Y. Hitchcock, Jr. J. Boston Soc. Civil Engrs. 47, 39-55 (Jan. 1960).

A laboratory investigation was made to determine optimum treatment procedures to reduce the level of copper, zinc, and trivalent chromium in wastes expected from a new copper and brass tube mill. The waste volume was estimated to be 400 gpm and to contain 50 ppm each of copper and zinc and 150 ppm of sulfuric acid, with a pH of about 2.5. Titration curves were developed which indicated that a pH of 9.5 was the optimum pH to be used to precipitate metallic hydroxide sludges. Studies concerned with the effect of flocculator speed on coagulation indicated that best results were obtained with a peripheral flocculator speed of 0.25 ft. per second. Although initially it was thought that a proper overflow rate for the removal of metallic hydroxides should be 200 gallons per square foot per day, model studies led to the conclusion that it would be safe to design on the basis of overflow rates of 600 to 800 gallons per sq. ft. per day. In the actual treatment process, wastes flow from the copper and brass tube mill to an equalization lagoon. The wastes are pumped from the lagoon to a mixing tank where lime is added. They then flow to a flocculator and sludge from the flocculator flows to 2 lagoons where it is decanted, the top water being pumped back through the treatment process. Strong pickling acids and spent dichromate brighteners are diverted to separate sumps. Sulfuric acid and sodium bisulfite are added to the dichromate to reduce the hexavalent chromium to trivalent chromium. Operation of these 2 tanks is based on the assumption that normal mill operation would not occur simultaneously with the dumping of pickle tanks or dichromate tanks. Operation results to date show that the plant is functioning as anticipated.

-- Cond. from Public Health Eng. Absts.

- 1034 New Equipment Upgrades Refinery-Waste Treatment by Activated Sludge Process. A. A. Kalinske. Oil Gas. J. 57, 75-77 (Dec. 21, 1959).

Refinery wastewaters are amenable to treatment by aerobic decomposition processes ranging from application of the completely-mixed high-grade activated sludge process to the simplest stabilization pond or lagoon. Mechanical equipment applicable to each process is discussed. Use of turbine aerators designed for oxygen-absorption efficiencies of 25% or more in a completely-mixed activated-sludge system capable of operation at relatively high mixed-liquor solid concentrations permits volumetric BOD loadings several times those used in the traditional process. This type of aerator furnishes 2.0 to 2.5 lb. of oxygen per hp-hr. Turbine surface aerators providing 2.5 to 3.0 lb. of oxygen per hp-hr. can be installed on platforms or rafts in stabilization basins to supplement natural aeration and reduce the size of the basin required, with or without solids recycle.

-- Public Health Engr. Absts.

03120655

INDEX

<u>Abdomen, blunt trauma</u>	949	<u>Cancer, lung</u>	
<u>Abrasive wheels, safety in use of</u>	1030	air pollution	1025
<u>Air pollutants, mass loading analyzer</u>	1007	asbestos	982
<u>Air pollution</u>		and smoking	958
and chronic bronchitis	1024	<u>Chloride analyzer, automatic method</u>	972
conservation of air resources	1014	<u>Chloroform, clinical anesthesia</u>	976
control, in Canada	1013	<u>Chromatography</u>	
damage to		for organic vapors in air	1006
fruit trees	1016	<u>Cold (low temperature)</u>	
plants, prevention by vitamin C	1018	trauma and vascular diseases	988
estimation of emissions	1015	<u>Cyanides, determination in water</u>	969
from exhaust gases	1012	<u>Dermatitis, dermatosis(es)</u>	
and lung cancer	1025	Bechet's disease	960
measurement(s)		from drugs	962
calibration of gas detection devices	1005	Norwegian scabies	964
by gas chromatography	1006	occupational in California	943
instruments	1002	from ragweed	961
role of public health laboratory	1019	from rubber gloves	963
<u>Air sampling, freeze-out technique</u>	1004	<u>Disinfectants, new developments</u>	1010
<u>Alcohol, metabolism current research</u>	1028	<u>Dust sampling, samplers</u>	
<u>Alcoholic, his community search for help</u>	1027	for flue gases	983
<u>Anthrax, human inhalation</u>	959	particle size measurement	984
<u>Asbestosis, and lung cancer</u>	982	<u>Electrical grounding</u>	
<u>Asthma, diagnosis of bronchial</u>	953	a new look	1032
<u>Bechet's disease</u>		<u>Electrostatic precipitators</u>	
a multiple symptom complex	960	discharge electrodes	985
<u>Books</u>		<u>Epileptics, work performance</u>	1029
health		<u>Exhaust gases, automotive engines</u>	
of people who work	942	emission from crankcase	1012
survey, U. S. Natl., acute conditions	944	oxidation of hydrocarbons	1022
incinerators, Natl. Fire Protection		<u>Eye</u>	
Standard	945	glaucoma detection	950
occupational dermatitis in California	943	tobacco amblyopia	951
sprinkler systems	946	<u>Fire(s)</u>	
tantalum and tantalum alloys	947	extinguishing	
<u>Boranes (boron hydrides)</u>		combustible metals and chemicals	1031
coulometric monitor	967	sprinkler systems	946
determination of decaborane	968	<u>Fluoride(s)</u>	
<u>Bromochloromethane, toxicity</u>	977	automatic recorder	970
<u>Bronchitis, and air pollution</u>	1024	separation from urine	971
<u>Burns, management of extensive</u>	965	<u>Fluorine, damage to fruit trees</u>	1016
<u>Cancer</u>		<u>Fungicide(s)</u>	
chemotherapy	957	toxicity of alkyl mercury compounds	973

<u>Gas detecting devices</u>		<u>Radiation (continued)</u>	
air-flow calibration	1005	medical reactors	996
		effect of nuclear weapons	998
<u>Glaucoma detection</u>		protection standards	997
general medicine problem	950	registration of sources, California	939
<u>Health</u>		<u>Radioactive</u>	
insurance for mental illness	948	fallout	
survey, U.S. Natl., acute conditions		biological consequences	999
and disability	944	and reactor wastes	1000
		monitoring air-borne materials	992
<u>Heart disease</u>		particles, photographic identification	1001
and environmental factors	955	waste(s) disposal	993
etiologiical investigation	954		
		<u>Radioelements, radioisotopes</u>	
<u>Heat and humidity</u>		permissible doses	991
effect on lightly clothed men	986	in science and industry	990
<u>Humidity, and optimum comfort</u>	987	<u>Radiological science</u>	
		role of public health laboratory	994
<u>Hypertension, from inhalation of silica</u>	980		
		<u>Retirement</u>	
<u>Incinerator(s)</u>		from viewpoint of medical director	1026
Natl. Fire Protection Standard	945		
regulation of design	1020	<u>Scabies, Norwegian</u>	
traveling grates	1021	among mental defectives	964
<u>Insurance, for mental illness</u>	948	<u>Silica, hypertension from inhalation</u>	980
<u>Lead workers</u>		<u>Silicosis, rapidly evolving type</u>	981
prophylaxis, therapy and rehabilitation	975		
		<u>Smoke sampler</u>	
<u>Manganous 1, 2 naphthoquinone-2-oxime</u>		developments in use of A.I.S.I.	1003
antiozonant against plant damage	1017		
		<u>Smoking</u>	
<u>Mercury</u>		pathologic effects	958
hazards of alkyl fungicides	973	patterns of university students	956
poisoning, affections of the larynx	974		
		<u>Solvent(s), eliminating hazards</u>	978
<u>Methylene chlorobromide, toxicity</u>	977		
		<u>Sulfur dioxide</u>	
<u>Occupational health</u>		measurement in atmosphere	1009
health of people who work (bk. rev.)	942		
		<u>Tantalum and tantalum alloys</u>	
<u>Odor(s)</u>		descriptive literature survey	947
control of obnoxious	1023		
determination techniques	1008	<u>Trauma, blunt injuries to abdomen</u>	949
<u>Ophthalmology, tobacco amblyopia</u>	951	<u>Tuberculosis</u>	
		mass screening; missed cases	952
<u>Ozone damage</u>			
protection of plants from	1017	<u>Ventilation</u>	
		flow resistance of metal hose	1011
<u>Pneumonitis, chronic interstitial</u>	979		
		<u>Vitamin C</u>	
<u>Poison control center</u>		prevention of plant damage by smog	1018
experiences of a Canadian	966		
		<u>Waste disposal</u>	
<u>Radiation (ionizing, nuclear, x-rays, etc.)</u>		from copper and brass tube mill	1033
chemical protection	995	in oil refinery	1034
injury, necrosis of ossicles	989		

INDUSTRIAL HYGIENE TRAINING COURSE

Conducted by
INDUSTRIAL HYGIENE FOUNDATION
and
DIVISION OF OCCUPATIONAL HEALTH, PUBLIC HEALTH SERVICE
at
Mellon Institute, Pittsburgh, September 12-23, 1960



Engineers and chemists attending industrial hygiene training course.
Seated, left to right: John P. McGinley, Keasbey & Mattison Co.;
D. E. Schaezel, General Mills, Inc.; R. J. Searle, Kennecott
Copper Corp.; Robert E. Kunkle, St. Joseph Lead Co.; E. C. Greene,
Johns-Manville Products Corp.; and M. J. Hipp, Boeing Airplane Co.
Standing, left to right: G. X. Korca, General Motors Corp.; Ronald
Sachs, The Upjohn Co.; William M. Smith, Weirton Steel Co., J. P.
Boyle, Boeing Airplane Co.; G. H. Farrah, Aluminum Company of
America; and T. F. Bodnarchuk, Johns-Manville Products Corp.

This was the first training course conducted by the Foundation for industrial hygiene engineers and chemists, and we are most gratified with the results. We were impressed by the attention, industrious and business-like attitude of the students as they personally prepared known concentrations of gases and vapors, calibrated gas sampling instruments, used gas detectors, made chemical analyses and ventilation measurements. The laboratory work was supplemented by lectures and demonstrations on pneumoconioses, toxicology, noise, radiation, industrial hygiene practice, and "homework" problem assignments. It was an intensive two weeks, not only for the students, but also for the instructors who devoted much time in preparing for the course and in keeping the program moving smoothly on a tight schedule. A final examination was followed by presentation of a Certificate of Training to the first "graduating" class. We are confident that the course was very much worthwhile and that the participants will have many opportunities to apply the knowledge which they acquired. Consideration is being given to future courses of this type.