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Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL

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INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE -- PITTSBURGH 13, PA.



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INDUSTRIAL HYGIENE FEATURES

The measurement of occupational mortality is discussed in Abst. No. 1049.

See Abst. No. 1050 for the application of scientific and laboratory techniques to industrial hygiene.

Levels in environmental health is the topic of Abst. No. 1054.

For information on the pulmonary response to tuberculin consult Abst. No. 1056.

For a discussion on the relationship of smoking to respiratory complaints see Abst. No. 1058.

Contact dermatitis from cinnamon in a candy maker is the subject of Abst. No. 1063.

Consult Abst. No. 1068 for information on phosgene poisoning caused by the use of chemical paint removers.

A simplified method for the estimation of nickel in urine is described in Abst. No. 1073.

Abst. No. 1078 is concerned with the toxicology of some aliphatic alcohols.

For data on the acute toxicity of triaryl phosphates used as plasticizers see Abst. No. 1082.

Clinical, bronchographic, radiological and physiological observations in ten cases of asbestosis are discussed in Abst. No. 1090.

How deep is dangerous? The answer is given in Abst. No. 1093.

Abst. No. 1095 concerns itself with a comparison of the "high-altitude" and "high-pressure" syndromes of decompression sickness.

A report on minimizing radiation hazards is presented in Abst. No. 1105.

A report on respiratory and cardiac deaths in Los Angeles smogs during 1956-1958 is given in Abst. No. 1114.

The subject of Abst. No. 1122 is motor exhaust gases and lung cancer in Cincinnati.

FOUNDATION FACTS

OUR SILVER ANNIVERSARY MEETING

The 25th Annual Meeting of Industrial Hygiene Foundation held at Mellon Institute, Pittsburgh, October 26-27 was attended by well over 400 representatives of industrial management and the health professions. The 38 papers presented at the meeting covered a broad spectrum of fundamental applied information. Numerous complimentary remarks indicated that the meeting was a very successful one. The Transactions of the meeting will be published in the March, 1961 issue of the Archives of Environmental Health, and copies will be mailed to members.

In addition to the Conferences, the Executive Committee met on Tuesday evening and the Board of Trustees on Thursday afternoon. The present officers of the Foundation: W. P. Yant, Chairman; K. W. Smith, Vice Chairman; E. K. Davison, Secretary; M. W. Thompson, Treasurer; T. C. Waters, Legal Counsel; and H. H. Schrenk, Managing Director, were re-elected.

1961 MEETING DATES SET

The 26th Annual Meeting is scheduled for October 25 and 26, 1961.

DR. W. P. YANT, I-H-F Board Chairman, has been elected Vice President for Research and Education of the National Safety Council's Board of Directors.

DR. K. W. SMITH, I-H-F Vice Chairman, has been appointed to the Medical Advisory Council of the American Association of Industrial Nurses.

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INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

1035 Illinois Tech Studies Ozone in Stratosphere.

An instrument designed to analyze the ozone layer in the stratosphere may unlock many of nature's secrets about weather. Under development for the Air Force Research Division, Geophysics Research Directorate, by Armour Research Foundation of Illinois Institute of Technology, the new "ozone analyzer" will be used to determine the extent of ozone in the atmosphere and variations with seasons. The instrument, mounted for test purposes on a KC-135 jet tanker, analyzes the ozone by measuring the heat given off by the decomposition process. Based on a conception by Francois Olmer, an ARF scientist, the present instrument uses tiny thermistors—temperature-sensing elements of metallic oxides related to semi-conductors—to measure the heat. For years it has been suspected that ozone, which is present in the atmosphere between 40,000 and 150,000 feet, plays a prominent role in determining the circulation of the atmosphere. In the stratosphere, absorption of the sun's ultra-violet radiation, for the most part, occurs in the ozone layer which protects us from the radiation's lethal effects. The sun's absorption and the accompanying processes of ozone formation and decomposition heat a layer in the stratosphere causing turbulence that may extend to the next higher layer—the mesosphere. It is this turbulence and the resulting air currents that are thought to affect the atmospheric circulation. The new "ozone analyzer" is expected to provide information that will cast more light on this phenomenon. With pilots and potential spacemen flying through or in close proximity to this ozone layer, another need for the ozone analyzer becomes quite apparent.

-- Cond. from Am. Soc. Civil Eng., Sanitary Eng. Div. News

1036 Worst Air Pollution.

The 12 "worst polluted areas in the United States", according to a poll of air pollution control experts conducted by Consumers Union, are: Birmingham (Ala.), Chicago, Cincinnati, Detroit, Los Angeles, New York, the Niagara area, the Ohio River Valley, Pennsylvania's Allegheny County, Philadelphia, St. Louis and West Virginia's Kanawha Valley. Of these areas, Consumers Union reported, only Los Angeles, New York, Philadelphia and Cincinnati have "relatively effective" air pollution control programs. "The conclusion to be drawn, of course, is that they would be dirtier still without their control programs," the consumer group said. The increasing health hazards and economic costs of air pollution throughout the country are: the use of the atmosphere as a "sewer" to carry off the wastes of combustion of modern industrial life is polluting the air so badly that "the problem in some areas has risen to near-crisis levels." The rate growth of metropolitan areas—there are now more than 200 in the United States—frequently makes air pollution control not merely a local problem but a regional one, calling for "cooperation among neighboring communities which pollute each other's air." Effective air pollution control requires three steps: (1) Monitor the air—determine which pollutants are present and measure their quantities; (2) Locate the sources of pollution, and (3) Control the sources of pollution. The problem of air pollution control "is not so much scientific as it is sociological and legal: to persuade or force polluters to take the steps required" to abate the pollution. Laws "with teeth in them will have to be enacted—and enforced."

-- Safety Maintenance

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1037 Smog Warning.

Advance warning of impending severe smog conditions is now available to all cities east of the Rocky Mountains under a new cooperative network operated by the Weather Bureau, the Department of Commerce, and the Public Health Service. Thirty-six states will be able to get warning bulletins by teletype from the Weather Bureau Research Station, located at the Public Health Service's Sanitary Engineering Center in Cincinnati. -- Science

1038 Handling Materials Cause Quarter of all Work Injuries.

From the caveman's crude wedge to the modern bucket conveyer, traveling crane and lift fork truck, materials handling has always been an important source of injury to workers, says a safety bulletin.... "Mechanical Handling of Materials",.... issued recently by the U.S. Department of Labor. Modern mechanical handling of materials, while decreasing the dangers of manual handling, has created some hazards of its own, the publication states. Despite increased mechanization, almost 25% of all disabling injuries in industry still occur in materials handling operations, the report says. It notes, however, that "mechanical factors are more subject to control than are human factors involved in handling materials by hand." The pamphlet defines and illustrates many types of conveyers; derricks, cranes and hoists; powered industrial trucks; and ropes, cables and chains. The importance of, and standards for designing safety into the manufacture of such equipment are discussed. Rules for safe operation of the various types of equipment as well as hand or whistle signals are given and where necessary accompanied by instructional drawings. Tables for safe working loads on ropes and cables based on the recently adopted Federal safety code for ship repairing are included. Sample copies of Bulletin No. 219, "Mechanical Handling of Materials", one of the Department's safety-in-industry series, may be obtained so long as the supply lasts, from the Bureau of Labor Standards, U.S. Department of Labor, Washington 25, D.C.

1039 New Extinguishing Agent Being Developed.

A powerful new extinguishing agent for fires in jet fuels, gasoline and other flammable liquids was demonstrated for the first time recently at MacArthur Field at Ronkonkoma, Long Island, New York. Although it is still in the development stage, the new dry chemical type agent is expected to have important fire extinguishing potential for air crash fires, as well as in the petroleum, chemical, marine and trucking industries. The new agent is called Purple K partly because of the purple glow it gives off on contact with flame. K is the chemical symbol for potassium—Purple K is actually potassium bicarbonate. It has been treated to make it free flowing, water repellent and non-caking. Untreated potassium bicarbonate cakes readily. Purple K was developed for the Navy Bureau of Weapons crash-fire research program. Development was initiated by the Naval Bureau Research Laboratory working closely with a number of extinguisher manufacturing companies. Purple K is non-toxic, non-corrosive, non-abrasive and does not freeze. The Navy has already begun to equip its fire crash trucks with Purple K, although it is not yet commercially available to industry. Purple K can be used with most existing dry chemical fire extinguishers. -- Cond. from Safety Maintenance

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OCCUPATIONAL DISEASE STATISTICS

1040 Occupational Disease Statistics. (Cases Reported to the Respective Health Departments.)

	Colo. Aug.-Sept.	Conn. Aug.	Ind. Aug.-Sept.	Pa. Sept.-Oct.	Tenn. Aug.-Sept.	Total
Acetone poisoning	1					1
Berylliosis		1				1
Beryllium poisoning	1					1
Carbon disulfide poisoning					1	1
DDT inhalation					1	1
Dermatitis	31	23*	3	30	30*	117
Fumes (unidentified)				2		2
Lead poisoning		1				1
Malathion poisoning					1	1
Parathion poisoning	2					2
Pneumoconiosis	3			24		27
Pneumoconiosis suspected				4		4
Pneumonitis, aluminum paint					1	1
Pneumonitis, chemical				1		1
Respiratory irritation				2	1	3
Silicosis	3	2		2		7
Silicosis suspected				7		7
Silico-TB, suspected				1		1
Tuberculosis			1			1
Miscellaneous	8					8
Total	49	27	4	73	35	188

* Causes are listed as follows:

Connecticut: Occupational dermatitis due to plants: poison ivy 2; occupational dermatitis due to oils and greases and metal cutting compounds 9; occupational dermatitis due to drugs: wound dressings and medications 1, local skin medications 1; occupational dermatitis due to other chemicals: acids 1, miscellaneous 4, synthetic resins or resin compounds 1; occupational dermatitis—other: miscellaneous 1, soaps or detergents 1, unidentified 1.

Tennessee: Dermatitis, cement 1.

COMING EVENTS

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- 1041 Nov. 27-Dec. 2 American Society of Mechanical Engineers, Winter Annual Meeting, New York
 Nov. 28-Dec. 2 Power Exposition - 24th National Exposition of Power and Mechanical Engineering, New York, N. Y.
 Nov. 30-Dec. 3 Canadian Heart Assoc. and Nat'l. Heart Foundation of Canada, Toronto, Ont.
 Dec. 1-2 Conference on Graduate Medical Education—"Educational Problems in the Internship and Residency", Philadelphia, Pa.

- Dec. 1-3 Western Surgical Association, Detroit, Mich.
 Dec. 3-8 American Academy of Dermatology and Syphilology, Chicago, Ill.
 Dec. 3-9 Chemical Specialties Manufacturers Association, 47th Annual Meeting, Hollywood, Florida
 Dec. 4-7 American Institute of Chemical Engineers, Washington, D. C.
 Dec. 4-9 Radiological Society of North America, Cincinnati, Ohio
 Dec. 6-8 Southern Surgical Association, Boca Raton, Florida
 Dec. 8 Society of Biological Psychiatry, New York, N. Y.
 Dec. 8 Synthetic Organic Chemical Manufacturers Assoc., Annual Meeting, New York
 Dec. 9 American Rheumatism Association, Dallas, Texas
 Dec. 9 Detroit Rubber and Plastics Group, Christmas Meeting, Detroit, Mich.
 Dec. 9-10 New York Heart Assoc., Symposium on the Myocardium, Its Biophysics and Biochemistry, New York, N. Y.
 Dec. 10-11 Academy of Psychoanalysis, New York, N. Y.
 Dec. 11-14 American Nuclear Society, San Francisco, Calif.
 Dec. 12-14 Problems and Progress in Water Pollution Control. National Conference, U.S. Public Health Service, Washington, D. C.
 Dec. 12-15 Industrial Building Exposition and Congress, New York, N. Y.
 Dec. 14-16 Atomic Industrial Forum, Annual Conference, San Francisco, Calif.
 Dec. 26-31 American Assoc. for the Advancement of Science, Annual Meeting, New York
 Dec. 29-30 ACS Division of Industrial and Engineering Chemistry, Christmas Symposium, St. Louis, Missouri

1961

- Jan. 7 Northwest Society for Clinical Research, Vancouver, B. C. Canada
 Jan. 8-13 American Academy of Orthopaedic Surgeons, Bal Harbour, Miami Beach, Fla.
 Jan. 16-18 American College of Surgeons, Sectional Meeting, Birmingham, Ala.

LEGAL DEVELOPMENTS

1942 Compensation News—Changes in Kentucky.

The state of "dark and bloody ground" long has required that any claim for further compensation under the occupational disease act be filed within one year after the last benefit payment from an earlier award was made. This assumes that the later claim involves disability due to some trouble the earlier award covered. Effective June 5, the one-year limit was dropped. These changes were effective as of June 16: Maximum and minimum benefits for death or total or partial disability increase \$4 a week. Maximum over-all benefits also increase. The Workmen's Compensation Board may award an extra \$1,000 beyond the normal maximum of \$2,500 for medical and surgical care. The burial expense allowance is \$500, not \$300. Anybody who files claim for silicosis benefits must have been exposed to silicosis within Kentucky at least two years just before his death or disability. -- Occ. Hazards

1943 Massachusetts to Relay on Accreditation by NSC.

The Massachusetts legislature in a recent bill recognized and put reliance on the accreditation procedure of the National Safety Council. The bill specifies that local or state safety council representatives on the official state Highway Safety Committee must come from safety councils accredited by the National Safety Council. It is believed that this is the first instance in which a state legislature has recognized the accreditation process. Governor Furcolo has signed the bill. -- National Safety News

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1044 Causal Connection—Lung Condition—Silicosis.

An employer was held responsible for compensation for an occupational disease when the conditions of the job were such that the disease could have been contracted on that job, independent of any other contact with the causes of the disease and when that job was the last one on which the claimant was injuriously exposed to the causes of the disease. The claimant did not have to prove that he contracted the disease on the last job, only that it was possible to do so. The claimant had worked in the employer's coal mine for over three years, operating a coal cutting machine. He was laid off for six months and then offered re-employment with the same company provided he could pass the company's physical examination. The examining doctor found that the claimant's lungs were congested from the effects of coal dust and he was denied re-employment. The employer argued that the claimant's degree of silicosis could not have been attained while he was working in his employ and thus the disease must have been contracted elsewhere. Medical testimony backed up the claim that the claimant must have contracted the disease elsewhere, but it also pointed out that the condition was made worse during the claimant's employment for the employer. Thus the court ruled that the medical findings supported the claim that the actual disability occurred from the injurious exposures to rock dust while the claimant was employed by the employer, since the disease was not serious enough to disable the claimant previously. A competent doctor stated that the claimant was totally and permanently disabled from working at his former occupation. The court therefore held that the claimant merited the Board's award of compensation for permanent disability. Affirmed. Blue Diamond Coal Company v. Napier. Kentucky Court of Appeals, June 10, 1960.
-- Reproduced by permission from Workmen's Compensation Law Reports, published by and Copyright 1960, Commerce Clearing House, Inc., 4025 W. Peterson Ave., Chicago 46, Ill.

BOOKS, PAMPHLETS AND NOTICES

- 1045 Meaning and Methods of Diagnosis in Clinical Psychiatry. T. A. Loftus. Lea & Febiger, Washington Square, Philadelphia 6, Pa. 169 pp. (1960). \$5.00.

The author of this work is Associate Professor of Clinical Psychiatry at the Jefferson Medical College, Philadelphia, Pa. His book will be found useful by every general practitioner, resident and student who wants to know how to handle patients in need of any degree of psychiatric understanding. It shows how to evaluate patients properly and how to guide them with effective, proved diagnostic procedures. Particular attention is focused on the meaning of diagnosis, with sound advice on how to conduct psychiatric consultations in a general hospital. There is a full chapter on psychiatric consultation in which the author stresses recent advances in understanding and manipulating the doctor-patient relationship as it is encountered by physicians regardless of their type of practice. An opportunity for self-testing comes in a series of condensed case histories. The reader is asked to list signs and symptoms of psychopathology and to suggest diagnosis. In addition to fundamentals, the author includes full discussions in the area of psychotic behavior and the use of drugs in diagnosis. The concept of normal versus neurotic behavior is emphasized fully.

- 1046 Symposium on Air Pollution Control. Anon. Presented at the Third Pacific Area National Meeting. American Society for Testing Materials, San Francisco, Calif., October 16, 1959. ASTM Special Technical Publication No. 281. American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa. 44 pp. (1960). Price \$1.50; to members \$1.20.

This symposium was sponsored by Committee D-22 on Methods of Atmospheric Sampling and Analysis as a part of its continuing program toward solution of air pollution problems by exchange of information and establishment of standards for analysis of the atmosphere. The symposium contains the following papers: Air Pollution Potential of California Coastal Climate, by E. Robinson. Wind and Weather Summaries for Chemical Plant

Design and Air Pollution Control, by R. J. Moore, et al. Fluorescent Dyes as Air-Borne Tracer Materials, by H. C. Wohlers, et al. The Colorimetric Determination of Formaldehyde and Methanol from Combustion Sources, by M. Feldstein. Determination of Gaseous and Particulate Inorganic Fluorides in the Atmosphere, by M. R. Pack, et al.

- 1047 Health Statistics from the U.S. National Health Survey. Series B-No. 20. Arthritis and Rheumatism Reported in Interviews. United States, July 1957-June 1959. U. S. Department of Health, Education and Welfare, Public Health Service. PHS Publication No. 584-B20. 26 pp. (Sept. 1960). For sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C. 25 cents.

The various forms of arthritis and the allied diseases usually referred to as "rheumatism" are of particular importance in the study of chronic disease because of the great amount of disability for which they are responsible. The magnitude of this disability is explained by the high prevalence of these diseases in the population which, in turn, is due to the long duration of individual cases. Moreover, in contrast to many other chronic conditions of a serious nature, arthritis is characterized by a comparatively low fatality rate. The combined effect of the long duration and the low death rate is the accumulation of cases of arthritis and rheumatism in the population, thus producing a high prevalence rate at any point in time. Definite arthritis cases are defined as those for which the physician was certain that the individual had some form of arthritis, but the differential diagnosis was not perfectly clear. On the basis of data from the U.S. National Health Survey during the period July 1957-June 1959, an estimated 10,845,000 persons in the United States were reported to have arthritis or rheumatism. This represents a rate of approximately 64 cases per 1,000 population, ranging from 2 cases per 1,000 among persons under 25 years of age to 286 per 1,000 among persons 75 years and older.

- 1048 Health Statistics from the U.S. National Health Survey. Series B-No. 21. Diabetes Reported in Interviews. United States, July 1957-June 1959. U. S. Department of Health, Education and Welfare, Public Health Service. PHS Publication No. 584-B21. 22 pp. (Sept. 1960). For sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C. 25 cents.

The need to find and control cases of diabetes, and thus to prevent or to postpone disability and deaths due to it—rather than excessive prevalence—makes this chronic disease one of the major health problems in the United States today. Diabetes mellitus ranks far below such chronic conditions as heart disease and hypertension in number of cases and deaths, but it is nevertheless eighth among the 10 leading causes of death, and fifth among diseases usually regarded as chronic, exceeded only by diseases of heart, cancer, vascular lesions of the central nervous system, and general arteriosclerosis, in that order. For the year ending December 1958, there were 27,500 deaths caused by diabetes mellitus, with a rate of 15.9 per 100,000 population. Diabetes prevalence data included in this report deal only with those cases: (1) which have been diagnosed; (2) about which the family has been informed; and (3) which are believed by the family to have been present in the year prior to the interview.

INDUSTRIAL MEDICAL PRACTICE

- 1049 The Measurement of Occupational Mortality. F. D. K. Liddell. Brit. J. Ind. Med. 17, 228-233 (July 1960).

In making comparisons of the mortality of different occupational groups, it is essential to allow for differences in the age distributions of the groups. The principle of "standardizing" for age is long established. Each of the two conventional methods, direct and

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indirect, leads to a "Standardized Mortality Ratio" (SMR) which is a weighted average of the ratios of the death rates, by ages, in the occupation, to the corresponding death rates in some standardizing population. In both methods, very great weight is given to the ratio obtained from the oldest age groups. Previous research has shown that there is serious distortion in the recording of occupations, which is greatest among the oldest age groups; the SMRs based on the conventional methods are thus subject to serious error, as well as to "bias". A more recent method, inverse, of particular use when the age distribution of the occupation is unknown, gives more equal weights to the ratios of the death rates for the various age groups. The SMR calculated by it, therefore, generally differs markedly from those obtained by the conventional methods. In a fourth, apparently new method, the weighting of the ratios of death rates is again more uniform than in the conventional methods; it has the further advantage of being based on the age distribution of the standardizing population rather than that of the occupation itself as is the case with the third inverse method. This "new" method of obtaining an SMR, for comparing mortality of the occupational group as a whole, is therefore the one which is least open to objection on logical grounds. However, each of the four methods, and of two others given in the literature, is an attempt to compare one occupation with some standard in terms of a single index, averaging the ratios of the death rates by ages. Such an index can take no account of the variation between these ratios and since this variation is often very great none of the methods can fail to be misleading in many cases. Further, the standard deviation of each index takes no account of this variation and so can be misleading also.

-- Author's summary

- 1050 Application of Scientific and Laboratory Techniques to Industrial Hygiene. K. Kay. Occ. Health Rev. (Ottawa) 12, No. 2, 2-7 (1960).

This article appeared originally in the Canadian Medical Services Journal, June 1960.

It has been the purpose of the present review to demonstrate that in the present technical era, health care of working people requires the use of scientific and laboratory facilities in several of the disciplines. The needs may be grouped under the following headings: (1) Toxicology and dermatology. (2) Physiological and psychological hygiene. (3) Ophthalmology and Otolaryngology. (4) Industrial Hygiene Engineering. (5) Chemistry and Physics. There are a few large industrial concerns in the United States having laboratory engineering and medical organizations capable of providing service in these categories. The bulk of industries and unorganized agriculture have requirements of a widely diversified nature which cannot be met in their own organizations and have to be sought outside as needed. This is generally the case in Canada where industries are small. At the present time the Departments of Health (in Canada) are not staffed and equipped to assist in all the needed areas of scientific and laboratory service. An attempt is being made to assist the universities in development of research and teaching in areas useful to industrial physicians. This is being done by providing professional and financial aid. Apart from university developments it would appear that some advantage could be gained by having engineering and laboratory departments in the medium-sized industries generally undertake to embrace the safety and health fields as a recognized aspect of operations. Even the hospitals might develop laboratory services useful to local industry. Another idea which should soon be experimented with is a shared industrial hygiene laboratory service for a group of industries. This might be in industry or be provided from a local hospital.

-- Cond. from author's summary

- 1051 An Examination of the Relation Between Symptoms, Disability, and Serious Illness, in Two Homogeneous Groups of Men and Women. L. E. Hinkle, et al. Am. J. Public Health 50, 1327-1336 (Sept. 1960).

One hundred and sixteen men and 96 women, comparable in age, ethnic and social background, occupation, social and economic position, exposure to infection and trauma, place of domicile, and method of observation, were studied over a 25-year period (including 5 years of prospective observation), with regard to the nature and duration of every episode of disabling illness that occurred among them. The incidence of disabling illness among women was significantly higher than among men; however, the difference in incidence was almost entirely accounted for by a higher incidence of colds, "grippe", pharyngitis, acute gastroenteritis, dysmenorrhea, muscular pains, minor cuts and bruises, headaches, and minor episodes of tension,

anxiety, asthenia, or depression. The women were disabled more frequently, and for a greater proportion of the time, than the men. The incidence of serious, life-endangering illnesses was somewhat higher among the men. An analysis of the risk of death among the two groups, based upon expected case fatality rates of the illnesses experienced, led to an estimate, that, over a 20-year period, the men experienced a risk of death from illness greater than that of the women, in a ratio of approximately 4 to 3. It seems very likely that the higher incidence of illness reported by the women, the greater amount of disability that they experienced, and the greater number of visits that they made to the doctor, were largely the result of culturally determined differences in the attitudes toward what constitutes illness and what creates an acceptable reason for disability in men and in women.

-- Authors' summary

- 1052 Gynecological Problems—Their Effect on the Working Woman. Luella E. Nadelhoffer. *Am. J. Public Health* 50, 1337-1341 (Sept. 1960).

The effect of gynecological problems on the working woman can be minimized by an adequate pre-employment examination, health maintenance program, and cooperation, where illness occurs, between those caring for her medically and the industrial physician. Pre-employment examination should include examination of the breasts and pelvic examination, preferably vaginal. The latter may be performed by the individual's own physician, who may send his report, or by the industrial physician. The industrial physician has an excellent opportunity for health education in this field, again with the cooperation of the private or clinic physician and public health officials. This may include talks, distribution of pamphlets, and films; for example, The American Cancer Society's "Self Examination of the Breast" and the more recent one on "Uterine Cancer—Problems of Early Diagnosis". The individual should be encouraged to have regular physical checkups, including breast and pelvic examinations. Papanicolaou smears of the cervix should be done once yearly or more often as indicated.

-- Cond. from author's comment

- 1053 Imipramine (Tofranil) in Mental Health Clinic and Private Practice. B. V. Earle and A. M. Earle. *Can. Med. Assn. J.* 83, 804-806 (Oct. 8, 1960).

Imipramine is an effective drug in the treatment of endogenous depression and valuable in reactive and psychoneurotic depressions. Severe, suicidal depressions still require electroconvulsive therapy initially. Some patients are resistant to the drug and need electroconvulsive therapy but the majority of patients respond satisfactorily. It would appear to be particularly effective in patients with early depression seen in general practice. Toxic reactions do occur, but if anticipated so that they can be either prevented or rapidly and effectively treated, they should not prove any bar to use of the drug. -- Authors' summary

- 1054 Levels in Environmental Health. F. M. Stead. *Am. J. Public Health* 50, 312-315 (Mar. 1960).

The entire field of environmental health consists of four basic sectors: Water Sanitation, Food Sanitation, Air Sanitation and Shelter Sanitation. Four basic levels of concern in each sector are: (1) insuring elements of simple survival; (2) prevention of disease and poisoning; (3) maintaining an environment suited to man's efficient performance; (4) preservation of comfort and the enjoyment of living. The development of a sound program in each sector should proceed from research through field investigation and analysis and interpretation of collected data to the final action program itself. -- Public Health Eng. Absts.

- 1055 Expired Air Resuscitation. J. Cox, R. Woolmer and V. Thomas. *Lancet* 1, 727-730 (Apr. 2, 1960).

Much work has been carried out in the United States and other countries on the efficiency of expired air resuscitation but this is the first report of a controlled study to

appear in Britain, undertaken on behalf of the Royal Navy. Twenty-two experiments are reported in which the expired air resuscitation technique (by mouth-to-airway) was practiced for periods ranging from 15 to 115 minutes on anesthetized and paralyzed subjects by "breath donors" who had never performed the method previously. Continuous measurements were made of tidal volumes and of carbon dioxide concentrations in both the donor's and the subject's expired air during the course of each experiment. Apart from the convincing experimental evidence, the various objections which have been raised to the adoption of the technique of direct insufflation have been considered and the conclusion reached was that the efficiency of expired air resuscitation for emergency use was such that it should be recommended as an alternative to the standard methods and in some cases, it may be the method of choice.

-- Cond. from Bull. Hyg.

- 1056 The Pulmonary Response to Tuberculin. P. Gross, Marian L. Westrick and J. M. McNerney. Arch. Pathol. 70, 233-243 (Aug. 1960). Reprints available from Industrial Hygiene Foundation upon request.

In guinea pigs, the pulmonary response to tuberculin consists basically of a proliferation of alveolar cells with associated propagation of reticulin fibers which tend to, and actually do, obliterate alveoli. Other features of this basic process include eosinophilic infiltrations and the presence in the air space of alveolar macrophages as well as multinucleated giant cells. With adequate sensitization or dosage of tuberculin, or both, the exudation of alveolar fluid and of neutrophilic leukocytes may mask this basic reaction. By the end of one week (with the dosage employed) these exudative features have largely subsided. However, the underlying basic reaction remains discernible weeks and even months later, but no collagen develops. The foci of involvement appear, nevertheless, to decrease in size and number with time. When the tuberculin sensitivity is of low degree, the pulmonary response to a small dose of tuberculin is not significantly different from that encountered with the same dose of tuberculin in non-sensitized animals. This agrees with observations of previous investigators. Ancillary to the alveolar tissue reaction, there is a reaction in the paratracheal lymph nodes consisting of granuloma-like clusters and masses of large acidophilic reticuloendothelial cells which generally are not associated with reticulin fibers. This reaction has been found in the paratracheal nodes as long as 5 months after an intratracheal tuberculin injection. Neither the proliferative nor the exudative features which constitute the reaction of lung tissue to tuberculin are of a specific character.

-- Authors' summary

- 1057 Pulmonary Lesions Following Inhalation of Oil or Oil-Containing Air. M. L. Post-Lingen. Nord. Med. 59, 290-292 (Nov. 20, 1958). Swedish.

Inhalation of oil may produce pulmonary lesions which vary with the type of oil. The most common cause of "lipid pneumonia" is mineral oil. In its early stages the condition frequently is asymptomatic, but may be accidentally revealed by roentgenographic examination or an autopsy following death from other causes. In severe cases the main manifestations are episodes of respiratory-tract infection, a hacking cough, and dyspnea. The vital capacity may be considerably reduced. The lesions produced by mineral oil generally are irreversible. Animal and vegetable oils, on the other hand, may be disintegrated and disappear from the tissues. The prognosis *quoad vitam* is good, provided that exposure to oil ceases and that complicating infections are adequately treated. The diagnosis is based on *inter alia* a history of exposure to oil, roentgenographic findings, and the presence of oil in the sputum or in specimens of pulmonary tissue. The differential diagnosis is especially important in regard to bronchogenic carcinoma so that the patient will not be needlessly subjected to major surgery on the suspicion of malignancy.

-- APCA Absts.

- 1058 Relationship of Smoking to Respiratory Complaints and Ventilatory Function. A. Wigderson and M. Kohan. Can. Med. Assn. J. 83, 585-587 (Sept. 10, 1960).

One hundred and thirteen males between the ages of 17 and 99 years were investigated to determine the relationship of smoking to respiratory complaints and ventilatory performance. The findings suggest that smoking is related to respiratory complaints. Smokers,

in addition, have reduced ventilation values, but this effect is not as marked as the relationship to respiratory symptoms. The disturbances in ventilation were not found to be progressive. -- Authors' summary

- 1059 A Starlike Pattern Observed in Cervical Mucus Smears Obtained from Patients with Breast Cancer and Endocrine Disorders. J. I. Borelli, et al. J. Natl. Cancer Inst. 25, 1 (1960).

Microscopical examination of argyrophil secretion smears from the cervical and vaginal mucus of 77 breast-cancer patients and 237 patients with illnesses other than breast cancer revealed that a starlike pattern occurs four times more frequently in the breast-cancer group. The percentage of occurrence of the starlike pattern was 45.2 in the breast-cancer group and 11 in the group without breast cancer. Endocrine abnormalities appeared to be associated with the occurrence of the starlike pattern. -- Can. Med. Assn. J. Absts.

SKIN DISEASES AND BURNS

- 1060 An Investigation into the Occurrence of a Specific Dermatitis in Native Mine Workers in the Orange Free State. E. M. McLean. Proc. Mine Officers' Assoc. (Johannesburg) 39, 41-47, Discussion 47-48 (July-Sept. 1959).

Considerable disability resulted from a dermatitis of the extremities affecting mainly underground workers in a group of mines in the Orange Free State. It was known locally as "Water Rash". The only symptom was itching, which was followed by a rash which was first macular and then vesicular. The vesicle ruptured and became secondarily infected and the last stage consisted of healing, leaving a dry skin with an exfoliating horny layer. Not only the feet, but occasionally the scalp, ear and axilla were involved. The histology was characteristic of an eczematous condition. During the year 1955, 189 cases were admitted to the hospital, approximately 50% of all cases seen, out of a total of 25,000 laborers. After extensive investigation it was believed that the trouble was due to working in a humid atmosphere associated with contact with an alkaline water aggravated by local trauma and sweating. The use of boracic powder on the feet and the wearing of thick woolen socks reduced the incidence. A variety of local applications were used in treatment, including hydrocortisone ointment. An early application of 10% salicyclic acid in 90% alcohol appeared to hasten the process of desquamation and shorten the duration of the illness if used in the early stages, but where the condition was advanced no specific remedy was found. -- Bull. Hyg.

- 1061 Allergic Reaction to Griseofulvin. R. Quero. J. Invest. Dermatol. 34, 283 (1960).

The author reports that a patient, after taking 3 griseofulvin tablets, developed a generalized pruritus, a disseminated erythematous and urticarial eruption, and a dyshidrotiform eruption of the hands and feet. There was a strong history of previous penicillin sensitivity. Intradermal tests for sensitivity to penicillin and griseofulvin were positive.

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

- 1062 The Effects on the Skin of Some New Adhesives and Laminating Materials. G. Hodgson. Brit. J. Dermatol. 72, 95 (Mar. 1960).

This review is based on a paper read at a Symposium on Newer Dermatological Hazards in Industry held by the Section of Dermatology of the Royal Society of Medicine on March 19, 1959. In it the author briefly summarizes the chemistry and the effects on the skin of rubbers and synthetic resins of the formaldehyde, polyester, isocyanate, silicone, and epoxide types when used for adhesives or lamination.

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

- 1063 Contact Dermatitis from Cinnamon. A. B. Kern.
A.M.A. Arch. Dermatol. 81, 599 (Apr. 1960).

Cinnamon is obtained from the bark of Cinnamomum zeylanicum but cassia (frequently used in place of cinnamon) comes from other varieties of Cinnamomum. The volatile oils of both contain as their chief ingredient cinnamic aldehyde, a powerful irritant, but, usually the amount of essential oil in the cinnamon powder employed by bakers, confectioners, etc., is very small. Since there is little mention in the literature of the etiologic significance of these substances in causing contact dermatitis, the author reports one such case in a candy maker.
-- J. Occ. Med. Absts.

- 1064 Recurrence of Trichophyton Rubrum Infection During Treatment with Griseofulvin.
C. Z. Berry, S. I. Shapiro and R. F. Dahlen. A.M.A. Arch. Dermatol. 81, 982 (1960).

A patient had an extensive Trichophyton rubrum infection of all the nails, the feet and lower legs, and right thigh. Microscopic examination of epidermal scrapings showed fungal products and the culture grew Trichophyton rubrum. The disease responded well to oral griseofulvin. After about 6 weeks of continuous griseofulvin therapy and while the patient was still taking griseofulvin, a new circular scaly KOH positive patch of dermatitis appeared, from which Trichophyton rubrum was grown.
-- Can. Med. Assn. J. Absts.

- 1065 Epidemics of Tinea Capitis Due to Trichophyton Verrucosum Contracted from Cattle or Sheep.
Z. Even-Paz and F. Raubitschek. Dermatologica 120, 74 (Feb. 1960).

Trichophyton verrucosum is implicated frequently in ringworm of cattle and occasionally in small epidemics of human tinea in rural areas. Two small epidemics of tinea capitis caused by T. verrucosum, affecting a total of 11 children, are described. Of significance to the industrial physician is the observation that the normal-appearing wool of some apparently healthy sheep could be pulled out easily. These hairs were shown to be parasitized. It is the contention of the authors that the use of such wool in textile manufacture might, aside from possibly resulting in weakened fabrics, lead to the infection of workers handling the raw materials.
-- J. Occ. Med. Absts.

CHEMICAL HAZARDS

- 1066 Infrared Spectrophotometric Determination of Diborane(6), Dichloroborane and Trichloroborane in Mixtures. H. G. Nadeau and D.M. Oaks, Jr.
Anal. Chem. 32, 1480-1484 (Oct. 1960).

Mixtures of diborane(6), dichloroborane, and trichloroborane are determined by infrared spectrometry. The individual components are determined directly from their characteristic absorption peak; diborane(6) at 5.35 microns, dichloroborane at 8.98 microns, and trichloroborane at 10.24 microns. The accuracy is influenced by the concentration ratio of three components in the mixture.
-- AC Briefs

- 1067 The Assessment of Electroencephalographic Changes and Memory Disturbances in Acute Intoxications with Industrial Poisons. B.C.J. Synkova and M. Sevcik.
Brit. J. Ind. Med. 17, 238-241 (July 1960).

A report is given of the results of the electroencephalogram (EEG) and of an experimental memory examination in a group of 22 cases of acute carbon monoxide and solvents

poisoning of varying severity. An abnormal EEG recording, most often in the form of theta activity 5 to 6 seconds, was found in 12 patients; memory disturbances were found in 13 cases. There was correlation between the results of the two examinations as well as with the clinical classification of the degree of intoxication. The methods are suitable for the solving of various theoretical and practical questions in industrial toxicology. -- Editor's summary

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- 1068 Phosgene Poisoning Caused by the Use of Chemical Paint Removers Containing Methylene Chloride in Ill-Ventilated Rooms Heated by Kerosene Stoves. W. B. Gerritsen and C. H. Buschmann. *Brit. J. Ind. Med.* 17, 187-189 (July, 1960).

Two cases resembling poisoning by phosgene following the use of a paint remover containing methylene chloride in ill-ventilated rooms heated by an oil stove are described. Experiments carried out under similar conditions demonstrated the production of phosgene in toxic concentrations. The potential hazards from non-flammable solvents are discussed. -- Editor's summary

- 1069 Methods for Separation and Determination of Beryllium in Sediments and Natural Waters. J. R. Merrill, M. Honda and J. R. Arnold. *Anal. Chem.* 32, 1420-1426 (Oct. 1960).

In the course of studies on natural beryllium isotopes, methods were developed for spectrophotometric determination of beryllium in silicates at the parts-per-million level, for separation and purification of beryllium at this concentration from large sediment samples by solvent extraction and cation exchange, and for radiochemical purification of beryllium. The use of dispersed insoluble hydroxides on cation exchange columns permits rapid removal of beryllium, at concentrations below $10^{-10}M$, from large volumes of sea water. This method is of more general applicability. The nature of the reaction was also studied. -- Authors' summary

- 1070 Results of an Otorhinolaryngological Investigation of Factory Workers with Particular Regard to Chromium Workers. S. Csillag and E. Hochenburger. *Nepegeszseguy (Budapest)* 40, 177-180 (July 1959). Hungarian.

The authors have carried out a clinical investigation of 35 persons working in a chromium plating shop. One worker who had been exposed to chromic acid vapor for many years was found to have a perforation of the nasal septum, and in 7 others a gray patch was observed on the anterior part of the nasal septum. In an investigation of 285 workers in the same factory 87 (27%) were found to have some abnormal condition of the ear, nose or throat, requiring operative treatment (resection of septum, nasal polyp, laryngeal papilloma). -- Bull. Hyg.

- 1071 The Dichromate Content of Hungarian Cements. L. Darabos and J. Z. Mohos. *Nepegeszseguy (Budapest)* 40, 180-183 (July 1959). Hungarian.

The authors have investigated the dichromate contents of samples of raw material and final products from 6 Hungarian cement works. The cement from one works contained 0.3-3.0 mg. % chromium as dichromate, and contents of 0.3-0.9, 0.3, 0.02-0.04 and 0.1 mg. % were found in samples from 4 other works. No dichromate could be found in the raw materials. Attention is drawn to the risk of sensitization in persons constantly using cement with a high dichromate content. -- Bull. Hyg.

- 1072 A Biochemical Study of the Urinary Protein of Men Exposed to Metallic Mercury. J. C. Smith and Agnes R. Wells. *Brit. J. Ind. Med.* 17, 205-208 (July 1960).

Proteinuria is not usually reported in chronic mercury poisoning. The urine of 3 men exposed to metallic mercury vapor was found to contain protein. In 2, the proteinuria disappeared on removal from exposure. The urinary protein in 2 cases was investigated and

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found to be indistinguishable from serum protein by the criteria used. The bound carbohydrate values were similar to those found in nephritic urinary protein. One man was diagnosed clinically as a chronic nephritic over a year after removal from exposure. It would be premature to connect this condition with the preceding exposure to mercury.

-- Editor's summary

- 1073 A Simplified Method for the Estimation of Nickel in Urine. J. G. Morgan.
Brit. J. Ind. Med. 17, 209-212 (July 1960).

A simplification of Sandell's method for estimating nickel in urine is described. Nickel is a normal constituent of most articles of food and between 0.01 and 0.03 ppm are found in normal urine. There is a slight increase of urinary nickel in workers engaged in the carbonyl process. After accidental inhalation of nickel carbonyl, urinary nickel increased in a few hours and reached a maximum about the 4th day, returning to normal in 10 to 14 days. Although an increase of urinary nickel gives an indication of nickel carbonyl absorption, clinical signs and symptoms remain the best guide of the severity of poisoning.

-- Editor's summary

- 1074 Aerosol Inhalation of CaNa_2EDTA (Mosatil) by Workers Constantly Exposed to Lead Poisoning. L. J. Petrovic, M. Stankovic, M. Saicevic and D. Poletti.
Brit. J. Ind. Med. 17, 201-204 (July 1960).

An aerosol of CaNa_2EDTA ("mosatil") has been administered in a hospital to 2 groups of 5 men who had been working on a lead smelter and exposed to lead in air concentrations of the order of 0.6 to 1.25 mg. of lead per cu.m. Five patients each inhaled 0.6 g. of CaNa_2EDTA on 7 successive days, and 2.4 g. on the 9th day. An average of 21.6 mg. of lead was excreted during the treatment. Five patients given 2.4 g. of CaNa_2EDTA every other day for 8 days excreted an average of 14.2 mg. of lead each during treatment. The urinary coproporphyrin level fell to normal in both groups.

-- Editor's summary

- 1075 Myocardial Changes in Lead Poisoning. Tilde S. Kline.
J. Dis. Children 99, 48-54 (Jan. 1960).

Symptoms of palpitation, dyspnea and precordial discomfort in patients with chronic lead poisoning have been mentioned briefly in the literature since 1829. The term "angina pectoris saturnina" was coined in 1926 for such conditions which were thought to be due to spasm of the coronary vessels. Sporadic cases have been described since that time. In a recent fatal case of acute lead poisoning in a 2-year-old child, complete autopsy was performed and changes in the myocardium characteristic of subacute interstitial myocarditis were found. There are 5 photographs of the microscopical findings. Previous autopsy records were then reviewed and disclosed myocardial changes in 4 more children who had suffered from lead poisoning. There are case reports of these children in which the most essential clinical and autopsy findings are given. In summary, "autopsy evidence of lead encephalopathy was found in all, in addition to chronic myocarditis". It is recommended that in cases of lead poisoning "routine electrocardiographic studies and close scrutiny for possible clinical evidence of myocardial damage" should be carried out.

-- Bull. Hyg.

- 1076 Calcium Versenate in the Diagnosis of Chronic Lead Nephropathy. B. T. Emmerson and B. R. Thiele. Med. J. Australia 1, 243-248 (Feb. 1, 1960).

In much of the chronic renal disease in Queensland, the incidence of which is greater than in other Australian states, lead poisoning in childhood from ingestion of lead-containing paint has been accepted as the major etiological factor. All the reported investigations on this subject, however, have "revealed the difficulty of deciding incontrovertibly during life whether, in a particular case of chronic renal disease, the lesion was due to childhood lead poisoning or to other factors." In this paper there is a detailed account of the methods of investigation undertaken to determine the urinary lead excretion after the intravenous injection of calcium versenate

in 9 patients with nephropathy and one who had had lead poisoning in childhood but had no renal lesion. There were 6 normal control subjects. The results of the study are described and discussed fully with tables and figures. It was found that increased and prolonged urinary lead excretion followed on intravenous infusion of 1.0 g. of calcium disodium versenate in "some patients with advanced renal disease due to childhood lead poisoning who had had no appreciable exposure to lead for periods of up to 40 years." It is suggested that infusion of versenate may be of value in the diagnosis of chronic lead nephropathy.

-- Bull. Hyg.

- 1077 Toxic Effects of Petroleum Products. R. Fabre.
Arch. maladies profess. 21, 97-106 (Mar. 1960). French.

This paper contains an account of the toxic action on man and animals of some of the constituents of petroleum products such as pentane, hexane, heptane, octane and benzene. Particular mention is made of the skin diseases which may result from contact with a variety of petroleum products. In a recent study of 1,000 cases of occupational dermatitis in a Paris region, 168 were in men who had been in contact with these products. There were 133 cases of oil acne and of these 118 were due to cutting oils to which sulfur and chlorine compounds of various kinds have been added by the makers to make them suitable for use in high-speed machines.

-- Bull. Hyg.

- 1078 The Toxicology of Some Aliphatic Alcohols. Part 2. E. V. Henson.
J. Occ. Med. 2, 497-502 (Oct. 1960).

In this part of the review the industrial and clinical features of the following common alcohols are described in detail; methanol, ethanol, isopropanol, and butanol. The saturated, open-chain, monohydric alcohols have been reviewed in reference to their general actions and chemistry. As a group they are anesthetic-narcotic agents similar to the other organic solvents, and by some measurements the intensity of this action increases progressively with the chain length. Among isomers, branching and locating the hydroxy radical in secondary and tertiary positions decrease the narcotic action when comparison is made with the normal compound. Although reports of serious methanol intoxication are no longer received from industry, it remains a potentially hazardous chemical. The absence of industrial intoxications from the alcohols reflects the low order of toxicity of this homologous series and indicates that adequate environmental control over these solvents is maintained.

- 1079 Spot Test Detection and Colorimetric Determinations of Aliphatic Aldehydes with 2-Hydrazinobenzothiazole. Application to Air Pollution. E. Sawicki and T. R. Hauser.
Anal. Chem. 32, 1434-1436 (Oct. 1960).

Microgram quantities of aliphatic aldehydes are qualitatively detected and quantitatively determined using 2-hydrazinobenzothiazole as reagent. The reagent is incorporated into a spot plate detection test; a paper chromatogram test, which with standards may be quantitative; and a silica gel column impregnated with the reagent serves to detect or estimate the aldehydes in air and automobile exhaust fumes.

-- AC Briefs

- 1080 Rapid Ultraviolet Spectrophotometric Determination of Salicylate in Blood. G. W. Stevenson.
Anal. Chem. 32, 1522-1525 (Oct. 1960).

The salicylate content of whole blood or any blood fraction is determined spectrophotometrically using a single or double extraction. In the single extraction, salicylate is extracted with butyl ether and the absorbance measured at 307 millimicrons. For double extraction the butyl ether extract is extracted with a phosphate buffer at pH 6.86 and the absorbance measured at 296 millimicrons.

-- AC Briefs

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- 1081 The Acute Toxicity of Pesticides to Rats. T. B. Gaines.
Toxicology and Appl. Pharmacol. 2, 88-99 (Jan. 1960).

LD50 values for 42 pesticides and 2 metabolites of DDT administered in a single dose by the oral or dermal route to Sherman strain adult rats have been determined. A comparison of laboratory results and use experience indicates that there is a much closer relationship between dermal LD50 values and the occurrence of occupational poisoning than between oral LD50 values and occupational poisoning. The carbamate pesticide Isolan was observed to be different from other compounds tested in that it was considerably more toxic by the dermal route than by the oral route to rats.

-- Author's summary

- 1082 A Study on the Acute Toxicity of the Tri-Aryl Phosphates used as Plasticizers. H. F. Bondy
E. J. Field, A. N. Worden and J. P. Hughes. Brit. J. Ind. Med. 17, 190-200 (July 1960).

Previous workers have established that the toxicity of commercial samples of tri-tolyl phosphate (TTP) is due to the presence of phosphate esters containing the ortho-tolyl (ortho-methyl phenyl) group. The present series of experiments have shown that even when all ortho cresol is removed from the phenolic starting materials, the resulting TTP is still toxic. Experiments with pure esters of known structure have shown that the toxicity is not due to the presence of dialkyl substituted phenyl groups (even where one alkyl substituent is ortho to the phenolic hydroxyl, as in tri-2:4 and 2:5 dimethylphenyl phosphate), since such esters are not toxic in the doses used by the authors. Mono-ortho ethylphenyl di-para-tolyl phosphate or di-ortho-ethylphenyl mono-para-tolyl phosphate are toxic. As in the case of the ortho-tolyl phosphates, the mixed esters are more toxic than the tri-ester (tri-ortho-ethylphenyl phosphate), the latter being non-toxic to chickens at a dose level of 2,500 mg./kg. body weight. A phenolic fraction from which all the ortho-cresol and the ortho-ethylphenol has been removed has produced a TTP of a very low order of toxicity. This residual toxicity is probably due to the fact that not all the ortho-ethylphenol has been removed. A TTP made from a synthetic mixture of meta-cresol, para-cresol and 2:4 and 2:5 dimethylphenol proved to be non-toxic. If, in the preparation of tri-xylene phosphate, all ortho-cresol and all ortho-ethylphenol is removed, the resulting TXP is still slightly toxic. This residual toxicity has now been attributed to the hitherto unsuspected presence of ortho-propylphenol in the raw material, and mixed esters containing the ortho-propylphenyl group have, with one exception, also proved to be toxic.

-- Cond. from authors' conclusions

INDUSTRIAL DUSTS

- 1083 Notes on the Detection of Bacterial Aerosols in the Atmosphere by Means of Membrane Filters. O. Machala and K. Spurny. Folia Microbiol. 4, 240-244 (1959).

A method of detecting bacterial aerosols by means of membrane filters is described. The filters are dissolved in methyl or ethylglycol, which compounds in dilute solutions do not significantly inhibit the majority of bacteria. A comparison between this method and the impaction method is discussed.

-- Public Health Engr. Absts.

- 1084 Estimation of the Electrical Charge of Dust Particles. F. Minarik, et al.
Pravcovni lekarstvi 12, (4) 180-185 (1960). Hungarian.

The paper presents a description of a device for the qualitative and quantitative analysis of the electrical properties of dust particles. The fundamental mechanisms of the acquiring of an electrical charge by aerosols are discussed, and the apparatus and its component parts are described. Estimations made using the apparatus revealed that silica and

sodium chloride dust have mostly a negative charge, and that aluminum oxide and coal dust mostly a positive one. Some quantitative details on the electrical charges of individual particles are given. -- APCA Absts.

- 1085 Geometric Mean Particle Size and Its Application in the Sampling of Air-Borne Dust. S. Guruswamy and V.S. Narasimhachar. J. Sci. Ind. Research (New Delhi) 18B, 319-323 (Aug. 1959).

In order to compare sets of experimental data on the distribution of different sizes of particles in studies on the sampling of air-borne dust, it is necessary to choose suitable parameters of particle sizes. The method of calculating the geometric mean size from the experimental data is given, and the application of geometric particle size in dust sampling work has been illustrated. The results analyzed show the different applications of the geometric mean particle size to practical dust sampling work. The geometric mean size is useful in the following cases: (1) the study of the performance of one sampling apparatus under different conditions; (2) in the detailed study of a dust deposit from one sampling apparatus; (3) comparison of the performance of two sampling apparatus under a given set of conditions; (4) in the study of the variation of dust dispersion in a locality. -- APCA Absts.

- 1086 Flax-Dust Byssinosis and Chronic Non-Tuberculous Chest Disease in Belfast. J. S. Logan. Ulster Med. J. 28, 164-175 (Nov. 1, 1959).

Flax byssinosis occurring among workers in the flax and linen mills around Belfast has been recognized by Ulster physicians. The author describes 10 hospital patients with this disease which is said to be commonest among the hacklers who prepare the flax for spinning. Both hackling and the carding of tow are very dusty jobs. The clinical history is similar to that of byssinosis of cotton workers. There is chest tightness, breathlessness and cough on Mondays, which, as the disease progresses, occur on other days. All the patients described were under 58 years of age. Three apparently died of byssinosis and others were severely disabled by it. In Belfast it is quite a common disease easily recognized in its grosser forms by the occupational history, the Monday exacerbations of chest tightness and lack of characteristic radiographic changes in the lung fields. At present, flax byssinosis is not a prescribed disease. Therefore, neither disablement nor death benefit is payable. One of the patients in this series did make a successful claim against his employer at common law. The author emphasizes that his observations are based on hospital patients and that knowledge of this disease, its incidence and severity could best be advanced by surveys in industry. -- Bull. Hyg.

- 1087 Theories of the Causes of Silicosis. Part 1. G. W. H. Schepers. Ind. Med. & Surg. 29, 326 (July 1960).

This article is the first of 3 installments of a paper presented at the McIntyre Research Foundation Conference in January, 1960. The author includes a historical review of the recognition of silicosis as well as a comprehensive discussion of the chemical theories of causation of silicosis. The discussion includes the silica solubility theory, the sericite theory, and other impurity theories, the acidity theory, the unsatisfied valency theory, and the polymeric silica theory. The final concept put forth by the author involves the changes in elemental composition of lung tissues which may occur on exposure of animals and humans to quartz dust, and the possibility that such changes may play a part in the development of silicosis. -- J. Occ. Med. Absts.

- 1088 Theories of the Causes of Silicosis. Part 2. G. W. H. Schepers. Ind. Med. & Surg. 29, 359 (Aug. 1960).

This part of the review of the theories of the causes of silicosis includes both physical and biological theories. The discussion of the physical theories includes the possible effects of particle sharpness, piezoelectricity, surface change of particles, crystallinity, particle size and surface area, solubility, and adsorption properties of particles.

The section on biological theories of causation includes discussions of the role of tuberculous infection, the phenomenon of phagocytosis of particles and its relationship to fibroblastic activity, the distribution of silicotic nodules in the lymphatic apparatus of the lung, the possible role of lipids in the pathogenesis of silicosis, and the effects of silica on the blood vessels of the lung.

-- J. Occ. Med. Absts.

- 1089 Studies on Experimental Silicotuberculosis—Comparative Study with Dusts of Varying Contents of Free Silica. K. Akazaki and M. Matsuoka.
Tohoku J. Exptl. Med. (Sendai) 71, 183-192 (Dec. 25, 1959).

Tuberculous changes superimposed in the lungs of rabbits with experimentally-produced silicosis were found to be perceptibly more aggravated than those in control animals with simple tuberculosis. The tuberculosis lesions induced were somewhat more aggravated in the animals subjected to inhalation of a dust with a high silica content than in animals given a dust with a low content, but the differences were rather slight. With dusts of the same silica content, increasing the number of periods of inhalation of the dusts gave rise to more severe tuberculous lesions, in number, size, and tendency to exudative changes. In these latter cases the greater accumulation of the silica dust-carrying cells seems to suggest that in accounting for the development of silicotuberculous lesions, more attention should be paid to the total amount of silica, especially as it affects the dysfunction of the phagocytes due to their satiation with silica particles, rather than to the content of free silica in the dust.

-- APCA Abst.

- 1090 Clinical, Bronchographic, Radiological and Physiological Observations in Ten Cases of Asbestosis. G. L. Leathart. Brit. J. Ind. Med. 17, 213-227 (July 1960).

Ten cases of asbestosis (8 male, 2 female), aged 45 to 65 years have been kept under observation for periods up to 8 years. Bronchiectasis was demonstrated bronchographically in 6 cases. Clubbing of the fingers and coarse crepitations appeared to be signs of bronchiectasis rather than of uncomplicated asbestosis. It is suggested that the prevalence of bronchiectasis is higher than has been reported previously because the patients survived longer. Radiological findings are tabulated and compared with previous descriptions. In these subjects there was no relationship between radiological and clinical state. Nine patients eventually showed clinical deterioration and it often proceeded rapidly. The radiograph, however, usually remained unaltered. Pulmonary function tests, including diffusing capacity, arterial blood analysis and estimation of mechanical properties of the lung, were carried on in 10 cases, and in 11 asbestos workers (aged 35 to 64 years) without radiological abnormality. The steady state diffusing capacity for carbon monoxide at rest was lower in asbestosis than in control subjects. The pulmonary compliance was remarkably low in asbestosis and related fairly closely to the vital capacity. The maximum voluntary ventilation was also low and was related to increased pulmonary resistance but it cannot be said whether this is in the airways or in the lung tissue. Indirect evidence of inequalities of ventilation/perfusion ratio was obtained in most cases. There is no convincing evidence that pulmonary fibrosis occurs without radiological abnormality, but a defect of diffusion may occur. There is no test of pulmonary function which is diagnostic, but a low pulmonary compliance, especially if combined with a low diffusing capacity, is confirmatory. It is suggested that the demonstration of a progressive decline in vital capacity, or in diffusing capacity, may enable a diagnosis of asbestosis to be made before radiological abnormality has appeared, but this point has not been proved.

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PHYSICAL ASPECTS OF THE ENVIRONMENT

- 1091 Observations on the Occupational Life History of the Coal Face Worker at Two Collieries. O. P. Edmonds and D. S. Kerr. *Brit. J. Ind. Med.* 17, 234-237 (July 1960).

Coal face work is well known to be arduous and dangerous; it is performed in an unnatural environment even where conditions are good. Few men can continue this work until the age of retirement. They usually seek alternative employment either outside the industry or within the other major occupational groups of a colliery. The latter comprise the surface workers and those employed underground other than at the coal face. This paper is concerned with those who stay within the industry. From a study of 73 workers who left the coal face at two collieries, it indicates: (1) the extent to which migration to alternative employment occurs each year; and (2) the resultant distribution of ex-coal face workers among these other occupational groups. The length of effective working life of the coal miner on the coal face, the reasons which precipitate his leaving it, and the type of work which he is able to do are also described. This information is of economic importance but it is mainly of value in assessing the effects of coal face work upon the health of the coal miner.

-- Editor's summary

- 1092 Electric Space Charges and Human Health. I. H. Kornbluh. *Bull. Am. Meteorol. Soc.* 41, 361-367 (July 1960).

In the light of new knowledge emanating from the basic technical and biological work undertaken in the last 3 decades, there is little doubt that air ions are of biological significance. Evaluation of the physiological action of certain atmospheric elements encounters great difficulties. The biological influence of atmospheric electricity, and in particular, of air ions was studied by many investigators in this country and abroad. The initial results were not conclusive. Artificial generators of predominantly unipolar ions far beyond the concentrations encountered under natural conditions near the ground permitted an analysis of various somatic and mental reactions in persons exposed to ionized air. The results are encouraging and warrant further studies. There are 54 references in the bibliography.

-- APCA Absts.

- 1093 How Deep is Dangerous? H. J. Alvis. *J. Occ. Med.* 2, 485-490 (Oct. 1960).

The rapid spread of sport diving has placed many aquatic enthusiasts in the way of diving hazards. The well-trained diver knows that diving does not have to be deep to be hazardous. This is an attempt to emphasize the point that it is not the depth so much as the lack of understanding that marks the margin of safety in diving. Reports of diving casualties seen at naval installations in a period of approximately 3 1/2 years were sorted; 20 cases resulting from dives of less than 50 feet were found. On theoretical bases it should be possible to surface without decompression from a dive of indefinite duration to 33 feet. Practical experience proves this is not the entire story. Cases of decompression illness following shallow dives have been reported by several investigators. For this review, a depth of 50 feet (pressure of approximately 2 1/2 atmospheres absolute) was chosen because so many sport divers seem to think this is a depth of very little or no hazard. The 20 casualties comprising this report were using a deep-sea diving rig in 5 cases, a shallow-water face mask in 5 cases, an open-circuit Scuba in 3 cases, and a closed-circuit (oxygen) Scuba in 7 cases. The subject is discussed under the following topics: Deep Sea Diving Rig, Shallow-Water Diving Mask, Closed-Circuit Scuba, and Open-Circuit Scuba.

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- 1094 Decompression Sickness During Construction of the Dartford Tunnel. F. C. Golding, et al. Brit. J. Ind. Med. 17, 167-180 (July 1960).

A clinical, radiological and statistical survey has been made of decompression sickness during the construction of the Dartford tunnel. Over a period of 2 years, 1,200 men were employed on 8-hour shifts at pressures up to 28 pounds per square inch (psi). There were 689 cases of decompression sickness out of 122,000 compressions, an incidence of 0.56%. The majority of cases (94.9%) were simple "bends". The remainder (5.1%) exhibited signs and symptoms other than pain and were more serious. All cases were successfully treated and no fatality or permanent disability occurred. In two serious cases, cysts in the lungs were discovered. It is suggested that these gave rise to air embolism when the subjects were decompressed, and pulmonary changes may contribute more than hitherto believed to the pathogenesis of bends. Some other clinical features are described, including "skin-mottling" and an association between bends and the site of an injury. The bends rate is higher for the back shift (3:00 p.m. to 11:00 p.m.) and the night shift (11:00 p.m. to 7:00 a.m.) than for the day shift. In the treatment of decompression sickness it appears to be more satisfactory to use the minimum pressure required for relief of symptoms followed by slow decompression with occasional "soaks", than to attempt to drive the causative bubbles into solution with high pressures. During the contract the decompression tables recently prescribed by the Ministry of Labour were used. Evidence was obtained that they could be made safer, and that the two main assumptions on which they are based (that sickness will not occur at pressures below 18 psi; and that a man saturates in 4 hours) may be incorrect. It is desirable to test tables based on 15 psi and 8-hour saturation. The existence of acclimatization to pressure was confirmed; it is such that the bends rate may fall in 2 to 3 weeks to 0.1% of the incidence on the first day of exposure. Acclimatization is lost again, with a "half-time" of about 7 days, if a man is away from work.

-- Cond. from Editor's summary

- 1095 A Comparison of the "High-Altitude" and "High-Pressure" Syndromes of Decompression Sickness. M. De G. Gribble. Brit. J. Ind. Med. 17, 181-186 (July 1960).

Decompression sickness is an illness which occurs in divers and caisson workers on return to normal atmospheric pressure after working at very high pressures, and in airmen on reaching very low pressures at great altitude. The disease seen after exposure to high pressure is described and compared with that seen on exposure to great altitude. Mild cases show little difference, but serious ones very sufficiently to justify division of the disease into two distinct syndromes, high-pressure and high-altitude decompression sickness. Both syndromes are caused by the formation of gas bubbles in the blood and body fluids when the tension of dissolved gases becomes sufficiently greater than that of the surrounding atmosphere. These bubbles are composed of a mixture of gases, but their formation is determined mainly by the degree of supersaturation with nitrogen. The diver must first absorb excess nitrogen on exposure to pressure, and it is the subsequent release of this excess on return to the surface which causes decompression sickness; since his stay at pressure is limited, bubbles arise mainly from tissues which can absorb the excess gas readily. In the airman, on the other hand, all tissues are completely saturated with nitrogen before he is exposed to low pressure, and bubbles may arise equally well from any tissue. Nitrogen is much more soluble in fat than in water, so that fatty tissues can form a large reservoir of dissolved nitrogen which may later form a source of bubbles; but the blood supply of fat is poor and nitrogen diffuses slowly through it, hence although the potential capacity of the fatty tissues for excess nitrogen is great, they can only absorb it slowly. Obesity is therefore a major hazard in high-altitude decompression sickness, but relatively unimportant in the high-pressure syndrome. Liability to the airman's sickness increases markedly with age, but the incidence of the diver's syndrome is affected both much less and later in life.

-- Cond. from editor's summary

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- 1096 Control of Noise, Protection of Workers against Noise and Vibrations. Principal Points for Consideration in Industrial and Commercial Undertakings. P. Chavasse, G. Saulnier and H. Nickles. *Ann. Occ. Hyg.* (London) 1, 186-202 (Apr. 1959). French.

The authors review the methods available to industry for the reduction of noise, and where this is impracticable for the protection of the workers from its harmful effects. Examples of industrial deafness are given and the nuisance caused by noise in the neighborhood of aerodromes and engine test plants mentioned but no account of the actual physiology is given. Emphasis is placed on the importance of good design and planning, but the authors recognize that this is a counsel of perfection and that efforts have to be made to reduce noise levels from existing machinery and installations. The question is considered under the following headings: (1) Alterations and improvements that can be made in the general surroundings—walls, ceilings, floors. (2) Choice of suitably designed machinery and alterations to existing equipment. (3) Proper maintenance of machinery and suitable methods of fixture. (4) Correct placing of machinery and of the operators. (5) Protection of the individuals. The last can be achieved by proper application of all the measures previously discussed together with personal protection (ear defenders) where this is necessary.

-- Cond. from Bull. Hyg.

- 1097 Sound Insulation in Buildings. E. F. Stacy.
Roy. Soc. Promotion Health J. 79, 789-797 (Nov.-Dec. 1959).

The technical principles concerned to control sound transmission in buildings are explained, reviewing those concerned with air-borne sound and impact sound. Standards and criteria on noise level and on sound insulation can be applied in design.

-- Public Health Eng. Absts.

RADIOACTIVITY AND X-RADIATION

- 1098 Neoplasia Following Therapeutic Irradiation for Benign Conditions in Childhood.
E. L. Saenger, et al. *Radiology* 74, 889-904 (June 1960).

A series of 1,644 persons of a total of 2,230 who were irradiated over the head, neck, and chest in infancy and childhood was compared with 3,777 siblings with respect to subsequent medical history. Eleven carcinomas of the thyroid were found in the patient group; none were found in the sibling controls. This incidence of carcinoma of the thyroid in the irradiated group is about one hundred times that expected from current tables of morbidity and is comparable to that reported in other similar surveys. The incidence of infections and other non-neoplastic illness was greater among the patients than among their siblings. But a statistically significant difference in the mortality ratio in the two groups was also found, i.e., the death rate in the siblings was greater than that in the patients. Although there is a significant increase in the incidence of cancer of the thyroid following irradiation, radiation does not appear to be the sole factor responsible for the increased incidence but rather a contributing factor. This survey differs from previously reported surveys in the extent to which the total family health history was evaluated. The information obtained is extremely useful in placing in proper perspective possible carcinogenic factors other than radiation.

-- Nuclear Sci. Absts.

- 1099 Radiation Burden to Patients During Fluoroscopy. R. Pape and J. Zakovsky.
Fortschr. Gebiete Roentgenstrahlen 92, 543-561 (1960). German.

The radiation burden to patients during fluoroscopy was determined for four important types of screening, namely the examination of the chest, the stomach, the intestinal tract with enema, and the abdomen (examination of the appendix, pyeloscopy). The duration

of the fluoroscopic examinations was determined on 167 out-patients and on 677 patients of a hospital. On the average, shorter screening times were found on the out-patients. Measurement of the regional radiation burden was carried out on 143 toddlers, children of a later age, and adults whereby the incident doses and exit doses were each measured with 8 measuring chambers. Average and maximum values were compared with the calculated doses (surface-dose rate times time). The average dose is of the order of 10 to 25% of the calculated doses. The dose to the skin of children amounts to approximately a third to a half that to the skin of adults. Because of the lower kilovoltage used in the examination of children the gonads of the latter are usually exposed only to from 1/10 to 1/4 of the usual doses. A lead apron worn at the height of the hips affords an adequate protection of the gonads during the examination of the chest and shields the gonads from direct radiation on patients who undergo an examination of their stomach. The testicles may for all examinations best be protected by lead shields. In the hands of a well trained expert the genetic radiation burden entailed in fluoroscopy is thus considerably smaller than what is usually expected.

-- Cond. from Nuclear Sci. Absts.

- 1100 Lung Hazards from Inhaled Radioactive Particulate Matter. H. Cember. TID-5981. University of Pittsburgh, Graduate School of Public Health, Progress Report July 15, 1956 to July 14, 1957. 65 pp. (July 15, 1957). Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D.C.

Progress is reported in studies on the toxic effects of radioactive particulates in the pulmonary tract of rats. Data are included on the effects of insufflated thallium-204 loaded clay particles, implanted glass beads containing strontium-90, chronically insufflated barium sulfate containing sulfur-35, and acutely insufflated cerium-35-fluoride particles. Results are included from studies on the pulmonary retention of $Ce^{144}F_3$ and $Hg^{203}S$ particles.

-- Nuclear Sci. Absts.

- 1101 The Senses of Taste and Smell in Persons Working on Betatrons. L. V. Kuznetsova. Med. Radiol. 5, 82-84 (Apr. 1960). Russian.

The senses of taste and smell of 100 persons, 29 to 40 years old, who were working on betatrons for periods of 4 to 10 years were examined. They all worked in conditions of combined effect of penetrating radiation. It was shown that the sense of taste decreases to all stimuli, mainly to the bitter stimulus. The olfactory thresholds were increased to all substances used as stimuli. The absence to any complaints on impairment of the sense of smell points to the gradually developing hyposmia. Simultaneous diminution of the sharpness of taste and smell was noted in 43% of the cases. The olfactory thresholds were increased in healthy persons working on betatrons even after small doses of ionizing radiation.

-- Cond. from Nuclear Sci. Absts.

- 1102 The Carbon-14 Content of Urban Air-Borne Particulate Matter. J. P. Lodge, Jr., G. S. Bien and H. E. Suess. Intern. J. Air Poll. 2, 309-312 (June 1960).

Very large samples of atmospheric particulate matter were collected in the central part of St. Louis, Mo., and Los Angeles, California. The carbon-14 content of various fractions of the samples was determined and was interpreted in terms of the relative distribution of fossil fuels and contemporaneous sources of carbon to the particulate pollution of the area. It can be shown by this method, that substantially all of the aliphatic hydrocarbons in the samples are of fossil origin, while about one-fourth of the oxygenated materials are derived from living matter. The general applicability of the method is discussed.

-- Authors' abst.

- 1103 Strontium-90 in the Total Diet. Anon. Consumer Repts. 25, 289-293 (June 1960).

Food, milk, and drinking water representative of the total diet of a hungry teenager were collected in 24 cities throughout the United States and one in Canada. The diets

were analyzed for strontium-90 content. Results are compared with the strontium-90 levels in milk samples collected in the same cities. Results indicate that milk furnished only slightly more than half of the strontium-90 consumed in the total diet. -- Nuclear Sci. Absts.

- 1104 Radiation and Leukemia in Carcinoma of the Cervix. N. Simon, M. Brucer and R. Hayes. Radiology 74, 905-911 (June 1960).

Questionnaires concerning the number of leukemia cases developing in survivors of radium-treated cancer of the cervix were answered by 36 of the collaborators in the Annual Report on the Results of Treatment in Cancer of the Uterus. In more than 71,000 patients there appeared 12 cases of leukemia that may have been associated with radiation and an additional 4 cases of chronic lymphatic leukemia. A determination of the person-years at risk shows an incidence of leukemia of from 62 to 115 cases per million. This is essentially the same incidence as in women of similar ages in the United States and England. It may be concluded, therefore, that radium treatment for cancer of the cervix does not induce an increase in the incidence of leukemia among the survivors. -- Nuclear Sci. Absts.

- 1105 Minimizing Radiation Hazards. L. J. Cherubin. Chem. Eng. 67, 105-110 (June 27, 1960).

Some aspects of radiation and human health are discussed with emphasis on industrial methods of measuring and monitoring radiation. Hazards and possible damage to the human body are pointed out together with a discussion of the nature of radiation (cosmic, gamma, and x-rays; alpha, beta, and neutron particles). The different ways—external and internal—in which the human body can be exposed to radiation are given. Maximum permissible limits (MPL) are given for radionuclide concentration in the human organs and for irradiation of the body; the latter is set at 12 to 15 rem./yr. for the organs and 75 rem./yr for the hands and feet. This is for controlled areas only; outside these areas, the MPL is reduced by a factor of 10. The principles of monitoring radiation are discussed at length together with an outline of various monitors, e.g., Geiger, BF₃, and scintillation counters. Means of monitoring personnel and recording the data are discussed. Sometimes the data can be filed on punched cards. -- Nuclear Sci. Absts.

- 1106 Removal of Radioactive Particulates from Air. P. A. F. White and S. E. Smith. Research (London) 13, 228-233 (June 1960).

High efficiency particulate filters used in radioactive ventilation and extract systems at the Atomic Weapons Research Establishment at Aldermaston, Berks, England, are described with reference to the developments on new filter media and in filter design which have taken place over the last 8 to 10 years. The most recent designs are non-combustible and show greatly increased economy over older types. Mention is made of the use of primary separators where the dust burden is high. -- Nuclear Sci. Absts.

ENVIRONMENTAL MEASUREMENTS

- 1107 Air Pollution by Formation of Sulfuric Acid in Fogs. H. F. Johnstone and A. J. Moll. Ind. Eng. Chem. 52, 861-863 (Oct. 1960).

Formation of sulfuric acid from sulfur dioxide in fog droplets containing dissolved oxidation catalysts is important in air pollution. Rates of acid formation were measured in fogs formed under controlled conditions in air containing nuclei and 4 to 500 ppm of sulfur dioxide, corresponding to concentrations in stack gases from the combustion of sulfur-bearing

fuels after dilution 10 to 1,000 times. In expansion fogs with manganese sulfate nuclei, concentrations of sulfuric acid between 0.1 and 2 mg. per cubic meter were formed in less than 5 minutes, depending on the sulfur dioxide concentrations and the time of exposure of the fog. Other manganese salts produced similar concentrations of acid. Fogs formed with ferrous sulfate nuclei and those with mixtures of manganese sulfate and sodium chloride as nuclei produced acid at slower rates than fogs with manganese sulfate nuclei only. The highest rate of acid formation was in fogs with manganese sulfate nuclei at relative humidities just below 100%. In these fogs the rate of acid formation was approximately proportional to the concentration of sulfur dioxide between 4 and 500 ppm.

-- IEC Brief

- 1108 Determination of Lead in Air. G. Kühnen. Staub 20, 77-81 (Mar. 1, 1960). German.

Although the amount of industrial lead poisoning has lessened greatly in the last decades it remains necessary to control the actual amount of suspended lead dust in the atmosphere of work rooms in some industries. There is in this paper some discussion of the methods which may be employed for the determination of the concentration of suspended lead and of the accuracy of these methods. There is a full account of a method developed by the author in which there is a description, with a diagram, of an apparatus for obtaining by filtration the dust contained in a measured volume of air. The chemical analysis of determination of lead is carried out by a dithizone method which is also described in detail and is claimed to be time saving because purification of the reagents is unnecessary. Some experimental results with the method indicate that it may be used for determining amounts of lead in a range of 10 to 120 micrograms with an average accuracy of 1.0%.

-- Bull. Hyg.

PREVENTIVE ENGINEERING

- 1109 Neoprene Ducts Resist Abrasion. Anon. Natl. Safety News 82, 158 (Oct. 1960).

In a plant manufacturing commercial abrasives, the ductwork in the dust-collection system takes a lot of severe punishment. The dust created during manufacturing operations is composed of extremely sharp, hard particles. The Norton Company, of Worcester, Mass., has been manufacturing abrasives since 1877. Dust removal has been one of the operating problems, and many tons of sheet metal ducts have been eroded away since the company began business. Many ingenious attempts were made to solve this maintenance problem. Air velocities were modified, pipes were rotated to equalize wear, and various protective coatings were applied. But still the ducts wore through in an uneconomically short time. About 6 years ago, spiral wire-inserted neoprene hose was tried. It worked so well that its use was extended throughout the plant as replacements became necessary. In dust collectors carrying abrasive particles at 3,500 fpm and higher, neoprene elbows were found to have 12 times the life of galvanized iron or 16-gauge steel tubing. In addition to internal abrasion resistance, the flexible tubing also showed high resistance to external attack by oils, heat, and aging. William J. Samborski, Norton maintenance engineer, has found 4 important advantages in the neoprene construction: easy installation, self gasketing, long wear, and flexibility for use with moving equipment.

- 1110 Ventilation Requirements. L. Rispler. Occ. Health Rev. (Ottawa) 12, No. 2, 21 (1960).

When lead-acid storage batteries are charged, gases are formed which escape freely during the latter part of the charge. Oxygen is evolved at the positive plates and hydrogen at the negative plates. Since 4% of hydrogen in air is the lower limit of flammability, precautions should be taken to prevent explosions. Smoking, or the use of open flames, or of tools which may generate sparks should be avoided; and suitable ventilation should be provided

to prevent the accumulation of an explosive mixture. Ventilation is also desirable for removing any acid spray and cooling the batteries. The author shows how to calculate a desirable ventilation rate for a battery-charging room. When the ventilation system is installed the location of air inlets and outlets should be carefully chosen for uniform air distribution throughout the room. Some safety features could be incorporated into the design, such as an electrical interlock which would ensure that the fans are running whenever the charging equipment is used, and an alarm that would be energized whenever the design ventilation rate is not being obtained. Finally, after the system is in operation it should be periodically maintained and checked to assure efficient operation.

- 1111 The Effects of Mechanical Ventilation on Air-Borne Bacteria. T. C. Angus.
Med. Press 243, 214-216 (Mar. 9, 1960).

The author and a colleague estimated the effects of mechanical ventilation on the concentrations of bacteria in the air of an occupied lecture room, and in the present paper the possible significance of the results in relation to the ventilation of operating theaters is discussed. The experiments were carried out in 5 days. In the first experiment the room was closed, and there was no ventilation except a small amount of infiltration. On the remaining days the ventilation plant supplied air at about 26 cu. ft. a minute for each person. In one experiment the whole of the air supplied was fresh air from outdoors. In another there was no fresh air and all the supply air was drawn from the room itself. In the other two experiments respectively 4.8 and 13.4 cu. ft. per minute of the air supplied per person was fresh air and the remainder was room air recirculated. When the fans supplied only recirculated air the bacterial count was 23 bacteria per cu. ft., while when the mechanical plant was not used there was a count of 43 bacteria per cu. ft. When all of the air supplied by the fans was drawn from outside the count was 19 bacteria per cu. ft., and on the days with partial recirculation the counts were 25 and 22 bacteria per cu. ft., when the supply of fresh outdoor air was 4.8 or 13.4 cu. ft. per minute respectively. On days when the ventilating plant was running there was no great difference between the bacterial counts, and those counts were less than when the plant was not used. It has been said that organisms which cause dangerous post-operative wound infections are derived from soil and road dirt, and that therefore such material should be kept out of theaters.

-- Cond. from Bull. Hyg.

COMMUNITY AIR HYGIENE

- 1112 Air Pollution by Smoke and Sulfur Dioxide in London During Foggy Periods, November 1959 to January 1960. H. Stevenage. Smokeless Air 30, No. 113, 203-205 (Spring 1960).

During this period there were 4 fogs of relative importance. Measurements of air pollution were made by the Warren Spring Laboratory during the first 2 episodes in East Greenwich and during the second 2 near St. Giles Circus. Results indicated that both sulfur dioxide and smoke concentrations rose sharply during the foggy periods and dropped off when the fogs lifted. Fairly good correlation was also indicated between smoke concentration and visibility during the episodes.

-- Public Health Eng. Absts.

- 1113 The Estimation of Ground Level Concentration from an Elevated Source. P. J. Meade.
Intern J. Air Poll. 2, 303-308 (June 1960).

Sutton's equations for calculating ground level concentrations of gases or dusts of negligible fall speed due to an elevated source are put into a convenient non-dimensional form. This is done by incorporating in the equations the maximum value of the concentration and the distance along the axis of the plume where this maximum occurs. It is then shown how for each

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value of the stability parameter, n , a single curve gives the distribution of concentration over the whole area downwind of the source, for any values of the remaining parameters in Sutton's equations. The use of the curve and the diagram will avoid the necessity of computations involving exponential factors and alternative values of several parameters. -- Author's abst.

- 1114 Respiratory and Cardiac Deaths in Los Angeles Smogs During 1956, 1957 and 1958.
C. A. Mills. *Am. J. Med. Sci.* 239, 307-315 (Mar. 1960).

Bringing up-to-date his earlier studies on respiratory and cardiac deaths in Los Angeles ozone smogs, the author not only verifies the existence of almost 400 smog-correlated deaths a year in Los Angeles County, but also a direct and close relationship between daily maximum temperature and ozone (or oxidant) formation in the atmosphere there. This close ozone-temperature relationship exists at temperatures ranging from 46°F to 104°F during the 3-year period. It is pointed out that the excess deaths on smoggy days cannot logically be considered heat deaths except at temperatures above 96°F in Los Angeles low humidities, and therefore, that the firm conclusion seems fully justified that ozone (or oxidant) smogs themselves carry community health hazards at ozone levels above 0.1 ppm. It is pointed out that automobile exhaust output of unburned hydrocarbons (the major source of ozone performers) would have to be reduced by about 85 to 90% from present levels. Tables are given of 3-year daily maximum temperatures, daily respiratory and cardiac deaths, and daily average maximum ozone (or oxidant) concentrations for all reporting Los Angeles County stations.

-- Public Health Eng. Absts.

- 1115 The Re-Entrainment of Settled Dusts. R. A. Bagnold.
Intern. J. Air Poll. 2, 357-363 (June 1960).

The re-entrainment of settled dust deposits depends on a number of variable factors concerning both the internal structure of the wind and the composition and structure of the deposit. Owing to lack of understanding of the nature and magnitude of cohesive forces between fine particles, quantitative knowledge is confined largely to the entrainment of particles larger than 80 microns by steady parallel fluid flow. Under steady conditions the determining property of the wind is the drag it exerts on the boundary surface of the deposit. This drag can be inferred from measurements of the velocity gradient. The threshold wind gradient at which the deposit surface is disturbed decreases with particle size to a minimum of about 100 microns. Its increase as the size is further reduced is due in the first instance to the effects of air viscosity. But cohesive effects soon become dominant, and seem capable of increasing the resistance to disturbance indefinitely. Deposits of fine powders can be readily dispersed by the ballistic impacts of dust particles larger than 100 microns; and locally by previous mechanical disturbances which have caused short edges of the deposit to protrude into the wind stream.

-- Author's abst.

- 1116 Meteorological Aspects of Large Scale Air Pollution. L. Machta.
Public Health Repts. 75, 307-312 (Apr. 1960).

The broad scale air pollution problem will be with us in the near future if it is not here today. Three weather factors that favor pollution in the broad scale are: (1) small dilution due to lightwinds, and a low altitude thermal inversion which inhibits upward mixing; (2) the absence of rain scavenging; and (3) the persistence of this weather for several days, permitting pollutants to accumulate. All three of these occur with the warm high. The well-known pollution episode at Donora, Pa., in October 1948 was during the occurrence of a warm high over the eastern United States. Four studies are cited which show the importance of the warm high to atmospheric pollution. The problem of large-scale air pollution is almost certain to become aggravated in the future. Preventing dispersion of wastes into the atmosphere is the best way of avoiding episodes. Failing this, the meteorologist can assist: (1) by helping health officials monitor the atmosphere's cleanliness; and (2) continuing efforts to devise methods for predicting the dilution, transport, and removal properties of the atmosphere in case it becomes necessary to permit the release of pollutants only when meteorological conditions favorable to dilution have been forecast.

-- Public Health Eng. Absts.

- 1117 Adsorbing Sulfur Dioxide on Dry Ion Exchange Resins for Reducing Air Pollution.
R. Cole and H. L. Shulman. Ind. Eng. Chem. 52, 859-860 (Oct. 1960).

Many industrial waste gas streams contain materials which are recognized atmospheric contaminants. Development of technically and economically satisfactory processes for recovery or removal of these materials is of importance because of recent regulatory actions. Dry polymeric anion exchange resins adsorbed up to 50% of their own weight of sulfur dioxide from air-sulfur dioxide mixtures. Adsorption isothermus of dry IRA-400 (chloride form) silica gel, activated charcoal, and molecular sieve type 5-A at 25° and 100°C show the IRA-400 resin to compare favorably with recognized adsorbents. Commercially available anion exchange resins are thus potentially useful for recovery of sulfur dioxide from waste gas streams.

-- IEC Brief

- 1118 Controlling Air-Borne Bacteria—How Well Can It Be Done With Today's Air Sanitation Methods?
Part I. M. W. First. Air Engineering 2, 29-33 (Apr. 1960).

This is the first of a series on the review of methods used to combat spread of disease by air-borne droplets. Hospitals are the main consideration but findings can apply equally well to schools and other public buildings. A simple apparatus used for collecting air-borne bacteria is direct screening of air through a thin cellulose membrane containing submicron sized pores and direct culturing of the bacteria caught on the filter surface. Another air sampling device is the electrostatic air sampler which draws air over the surface of sterile culture dishes electrostatically charged to about 7,000 volts. Operation depends on the theory that all air-borne micro-organisms carry a positive or negative electrical charge. Collection efficiency is high for all air-borne bacteria. Outdoor air contains approximately 5 to 30 viable bacteria per cu. ft. of air near the earth's surface and bacteria have been found up to a height of at least 20,000 ft. Bacteria do not multiply in the air and are rarely capable of causing disease in man due to the combined effects of desiccation and the ultraviolet radiations in sunlight. Hospital air not only contains a reduced number of the same bacteria found in the outdoor air but is supplemented by large number of bacteria discharged into the air by occupants. It has been found that the bacteria content of room air rose 5 to 11 fold when the number of occupants increased from 2 to 9. Lethal ray, chemicals, air filters, washers and similar devices are described by the author as a means for air sterilization or decontamination.

-- Cond. from Public Health Eng. Absts.

- 1119 Control of Air Pollution. H. C. Austin and W. L. Chadwick.
Mech. Eng. 82, 63-66 (Apr. 1960).

It has been previously demonstrated that the reaction between unburned hydrocarbons and nitrogen oxide in strong sunlight produced the characteristic air pollution condition in Southern California. Understanding of the basic reaction has prompted efforts to control the discharge of hydrocarbons. Studies have been made to determine the feasibility of removing undesirable constituents from oil at the refinery. No economically practicable removal process has yet been found. Electrostatic precipitations will remove about 90% of the dust load. Siliconized glass cloth will remove 99% of the particulates from oil fires. Indications are that these bags would be more costly than electrostatic precipitations. The addition of ammonia stoichiometrically will almost completely remove sulfur trioxide. This reaction does not appear to be a practical solution. Vanadium catalyst is effective in removing nitric oxide and sulfur trioxide provided this is followed by ozone and electrostatic precipitation. Studies indicate that this is economically infeasible for full scale operations. Substantial reduction in nitric oxide can be achieved if less than normal combustion air is admitted through the burner and the remainder through an auxiliary air port. This is a significant development and has received full scale trial.

-- Public Health Eng. Absts.

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- 1120 Ambient Air Quality. W. L. Faith. Ind. Wastes 5, 44-45 (Apr. 1960).

This article is a summary of the Air Quality Standards adopted in December 1959 by the California State Board of Health. The proposed standards are presented in a table and use an "oxidant index" of 0.15 ppm for one hour by the potassium iodide method for the photochemical smog. For the non-photochemical smog the values for carbon monoxide, sulfur dioxide, and particulates are used. Three levels of air pollution are cited in the table: adverse, serious, and emergency. The use of the oxidant index is a compromise to avoid establishing numerical standards for the commonly accepted precursors of photochemical smog such as olefinic hydrocarbons and nitrogen oxides. The presence of bright sunlight and a stagnant meteorological condition cause the various oxidants to form and to increase in intensity. Footnotes give basic information to justify and authenticate the proposed values. The author warns that the standards are tentative, may be inapplicable to other areas and are only a guide to control of air pollution, not final and "gospel". When better data are presented, the standards will be changed.

-- Public Health Eng. Absts.

- 1121 A New Gas Absorption Device—Its Application to Titrimetric and Conductometric Micro Determinations of Carbon Dioxide in Air. I. Holm-Jensen.
Anal. Chim. Acta 23, 13-27 (July 1960).

A gas absorption device which is capable of absorbing gases from a stream of air, up to 15 ml./min., in a small volume of about 0.5 ml. of absorbing fluid is described. The absorbing area of contact between air and liquid is about 150 sq. cm. The apparatus is provided with electrodes for measuring the electrolytic conductivity of the absorbing liquid. It can be used in the determination of carbon dioxide in air by means of conductometric titrations; visual titrations with air by means of thymolphthalein are also possible. No back-titration of the strontium hydroxide absorbent is needed.

-- Author's summary

- 1122 Motor Exhaust Gases and Lung Cancer in Cincinnati. C. A. Mills.
Am. J. Med. Sci. 239, 316-319 (Mar. 1960).

The Cincinnati survey of 1955 showed a high degree of mathematical significance to exist between lung cancer incidence and (1) cigarette smoking, (2) living in air-polluted or clean residential areas, and (3) driving mileage in urban traffic. Further analysis of the same basic survey data now shows the lung cancer death hazards to be greatest at all ages above 40 for drivers who are residents of Cincinnati's polluted Basin areas, slightly less for drivers residing in clean suburban areas, and utterly lacking for drivers residing far out in clean rural areas whose driving is mostly on open country roads. In general, urban residents exposed in urban traffic for over 12,000 miles per year exhibit over twice the lung cancer incidence rates of those with lesser urban driving mileages. The author recommends that the medical profession give specific recognition to these urban driving hazards and to motor exhaust gases as the dominant factor in today's increasing development of the ozone-type smogs now recognized as community health hazards at ozone concentrations above 0.1 ppm.

-- Public Health Eng. Absts.

- 1123 Sulfur Dioxide Sensitized Photochemical Oxidation of Hydrocarbons. H. S. Johnston and K. Dev Jain. Science 131, 1523-1524 (May 20, 1960).

Near-ultraviolet sunlight is absorbed by sulfur dioxide to produce electronically excited molecules which react with n-butane in presence of wet or dry air to produce an aerosol and eventually a liquid precipitate. The product is a heavily oxidized sulfur-containing organic strong acid. The possible role of these reactions in photochemical air pollution is discussed. The studies were made with a view toward determining the role of sulfur dioxide in air pollution.

-- Authors' abst.

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MANAGEMENT ASPECTS

- 1124 Fitting the Worker to the Job. E. P. Friesen.
Occ. Health Rev. (Ottawa) 12, No. 2, 18-20 (1960).

If business and industry will learn to give the policy and financial support to the services which the industrial psychologist can render in selection and placement of workers alone, some remarkable changes in our productive capacity and human satisfaction for both management and employees could occur. The knowledge and skills which are now available to an enlightened employer could make it possible for him to select the practical level of productivity he wishes to have in his business or industry—assuming, of course, that there are a sufficient number of available employees from which to select the ones that are suited to his situation and to the particular kinds of work done in his organization.

-- Author's conclusions

- 1125 Rating Personnel Performance Effectively. J. R. Stock.
Battelle Tech. Rev. 9, 8-13 (Oct. 1960).

In recent years, several investigators working in the area of personality measurement have developed forced-choice scales which permit an individual to rate himself on certain personality characteristics. Although the research findings are too limited to be conclusive, the results obtained by this self-rating forced-choice technique strongly indicate potential for a high validity of measurement. The self-rating forced-choice technique has not yet been employed in the evaluation of employee performance, but, theoretically, it should yield the most valid results attainable with our present techniques. This statement is based upon the following three hypotheses: (1) A well constructed forced-choice scale reduces the effects of over-all and areal perceptual biases, conscious bias, and social pressure. (2) An individual rating himself, because of an immediate knowledge of his performance under many conditions, will give a more valid rating that reflects a reduction in the effects of environmental influences, performance errors, and observational errors. (3) The effects of over-all recall biases, areal recall biases, and recall errors will be reduced in a self-rating scale because of the individual's ability to draw upon a detailed store of information regarding past performance. Thus, it is possible that in the near future an administrator may utilize employee performance information reflecting the unique interests of management, first-line supervision, and the employee. This could be achieved through the use of combined ratings, selected portions of which would be executed by a management representative, a first-line supervisor, and the employee, respectively. The administrator would then be aware of the performance picture as viewed at all levels in the organizational hierarchy.

- 1126 Medical Care and Welfare Program for Hotel Workers in New York City. F. P. Guidotti.
J. Occ. Med. 2, 480-484 (Oct. 1960).

As a result of the agreement reached through collective bargaining by the Hotel Association of New York City, Inc., and the New York Hotel Trades Council, AFL-CIO, the hotel workers in 1944 became the beneficiaries of a health and welfare program that provided various forms of insurance, hospitalization through Blue Cross, and certain sickness and accident benefits. After 4 years' experience with the plan it was further agreed to provide a direct medical service program, financed by the employers and administered by a joint board representing the employers and the hotel trade unions. The plan covers 34,000 active employees of 185 hotels, as well as retired and pensioned union members. The center of this service program is a health center which provides comprehensive medical care at the ambulatory level. Emergency house calls and hospital care are provided by general practitioners and specialists respectively, who are affiliated with the program. The active staff of the health center com-

prises 17 general physicians and 6 internists, working part-time on regular schedules; an additional 57 serve in specialty clinics for limited scheduled periods of time. The cost of all physician services in the past year was \$628,750 (84% of center's operating cost), and the cost of x-ray, clinical laboratory, and physical therapy procedures was another \$123,000 (16%). The cost per patient averaged \$63.00, and the cost per eligible employee was \$22.44 (\$1.86 per month). The services of the health center itself, are described in detail, presenting the various phases of the over-all medical care program.

-- Cond. from author's summary

- 1127 Diagnosis and Compensation of Radiation Injury. Industrial Medical Association Radiation Committee. J. Occ. Med. 2, 503-507 (Oct. 1960).

While the diagnosis and compensation of radiation injury in industry is not easy, it is felt that it may be accomplished in an equitable manner on the basis of information now available and within the general framework of current compensation practices. It is hoped that other medical groups interested in establishing criteria for the diagnosis and compensation of harmful effects, arising out of occupational exposure to radiation, will add their efforts to those of the Industrial Medical Association in producing criteria for consideration of the American Medical Association. This statement should be reviewed periodically and modified when necessary as new data become available.

-- Authors' conclusion

ACCIDENTS AND PREVENTION

- 1128 Crash Assignment—Traffic Accidents Scrutinized by the Pennsylvania Department of Health. C. L. Wilbar. Am. J. Public Health 50, 1349-1354 (Sept. 1960).

The attitude and action of human beings constitute the most important factor involved in either the prevention or cause of traffic accidents. The human aspects of traffic accident causation have not been given the attention and study they deserve compared to other aspects, such as vehicle construction, road construction, and signs. Health departments have a major role to play in traffic accident prevention. Health departments have been slow in assuming this role, although they have been working increasingly in the field of prevention of other types of accidents and although motor vehicle administrator and traffic safety organizations are urging health departments to substantially aid in the prevention program for this major killer and maimer, which occupies much of the spotlight of public interest. The Pennsylvania Department of Health has been making some progress toward meeting what seems to be its obligation in this field of public health endeavor. It has aided in having prepared, mainly by committees of the Medical Society of the State of Pennsylvania, physical standards for issuing, suspending or revoking driver's licenses for passenger transport, commercial and private vehicle drivers. It has conducted preliminary studies on alcoholism as a factor in traffic accidents which indicate that the alcoholic is much more dangerous than the "social drinker". It is underway in studying accident repeater data to help determine the types of individuals frequently involved in traffic accidents. Much remains to be done.

-- Author's conclusion

- 1129 Occupational Health Service Experience of Two Hotels for 1955 and 1956. Josephine A. Cipolla, J. W. Meigs and M. L. Brown. J. Occ. Med. 2, 473-479 (Oct. 1960).

There are measurable differences between the industrial accidental-injury experience of Hotel A, which provided an occupational health program, and Hotel B, which did not provide this service for its employees. Hotel A had: (1) lower disabling-injury severity rates; (2) fewer number of lost-time days per disabling-injury; (3) fewer cases whose compensability was doubtful or disputed; (4) more complete records of the professional care which was provided

to injured workers; (5) lower average medical-indemnity and expense payments per employee per year; and (6) a more nearly accurate picture of accident experiences upon which to formulate a safety and health program. The analysis of the industrial-accident experiences of Hotel A and Hotel B showed similarities as follows: (1) reportable-injury frequency rates; (2) disabling-injury frequency rates; (3) patterns of reportable accident by agencies: miscellaneous objects; working surfaces; position of worker; and hot equipment or substance; (4) patterns of reportable injuries by types: struck by; struck against; slip (not fall) or over exertion; and exposure to temperature extremes; (5) patterns of location of reportable injuries: the right foot or wrist; the left hand or wrist; foot or ankle; and lower back; and (6) patterns of reportable injuries according to nature of injury: contusions; lacerations; and strains and sprains. Hotel A had more nonreportable than reportable injuries in each of the two years. Since the data on reportable injuries suggest that accident experience was similar in the two hotels, it seems probable that Hotel B also had a considerable number of nonreportable injuries. The favorable data on severity of injuries, total cost, and total health service experience at Hotel A support the view that it is desirable to find and treat as many minor injuries as possible. Hotel A's experience further suggests that the professional nurse working with a part-time physician can safely and completely treat more injuries than she needs to refer to the physician.

-- Cond. from authors' conclusion

- 1130 Future Trends in Machine Safety. J. A. Dickinson.
Safety Maintenance 120, 16-18 (Oct. 1960).

The author discusses the subject under the following headings: Guarding Today, Effects of Automation, Safety Feeds, Assembly Line Techniques, Maintenance Hazards, and Old Problems. With regard to the home workshop group, the author states that here, in addition to working with machine tool manufacturers, safety men should wage an educational campaign using "off-the-job" safety training to reach those still working. Magazine articles and talks to retired personnel are clearly needed. It might be well to stress the need for guarding home workshop equipment as well as the need for eye protection and, in some cases (as wood turning and sanding), the desirability of respiratory protection. The home workshop group may be expected to increase rapidly, and already presents a real challenge to the safety engineer.

MISCELLANEOUS

- 1131 Sampling and Flow Measuring for Plant Surveys. P. B. Hodges.
Ind. Wastes 5, 1-6 (Feb. 1960).

Details of design, materials, and installation are given for the following inexpensive continuous composite automatic samplers suitable for various conditions, based on waste sampling developments and experience at a chemical plant area producing 65 products simultaneously. (1) Continuous vacuum samplers are used where power is not available and for sewers containing volatile-flammable materials. About one-half cubic foot vacuum tank is used for a 24-hour sample of 1 to 3 liters. (2) The electric continuous sampler uses a 1/20 hp modified commercial positive displacement pump for sewers having up to 20 feet suction lift. (3) The deep sewer sampler pump is mounted in the manhole with the motor unit outside the manhole and V-belt power transmission. (4) The slurry sampler consists of a slurry pump and siphon can from which portions of the pumped sample are collected at frequent intervals. (5) A compact automatic shift sampler which is relatively tamper proof has been designed to collect 10-eight hour shift samples of one gallon each. An electric pump delivers sample continuously to a distributor consisting of a 10 compartment trough and a flexible discharge line that is moved along a shaft over the trough by an rpm timing motor. Waste flow measurements are made by a modification of the sodium chloride dilution method using less common lithium chloride. Lithium is determined quickly in concentrations as low as 2 mg./liter by flame spectrophotometry.

-- Cond. from Public Health Eng. Absts.

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- 1132 A Positive Approach to Industrial Waste Control. C. S. Boruff.
Ind Wastes 5, 19-20 (Feb. 1960).

The increasing usage and increasing pollution load of our water supplies is cited. Municipalities, agriculture, industry, and official agencies recognizes the problem and their roles, responsibilities and relationships in its solution. Present abatement action must be intensified. Development of industrial waste abatement methods is the responsibility of industry and abatement costs are legitimate manufacturing costs. Some industrial waste abatement accomplishments and problems are cited. Suggestions to industry are to recognize pollution, cooperate with official agencies, study and plan, prevent pollution, and participate actively in community affairs and programs on water quality. -- Public Health Eng. Absts.

- 1133 Treatment Facilities for the Photoengraving Industry. W. A. O'Shana.
J. Water Pollution Control Fed. 32, 52-54 (Jan. 1960).

In summary, it is recommended that all low pH waste from photoengraving operations be collected and treated in holding tanks before discharge to the city sewerage system. Final pH of the waste should be within the range of 5 to 9. Suggestions for providing these conditions are offered and examples from a city study are cited. -- Public Health Eng. Absts.

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