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Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

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CHEMICAL

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LEGAL

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INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

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IN THE AIR AIMS NOVEMBER 1993

INDUSTRIAL HYGIENE FEATURES

The beginnings of industrial medicine in England are described in Abst. No. 1114.

A short discussion on blunt injuries of the abdomen is given in Abst. No. 1122.

Acute upper respiratory disease in industry is investigated in Abst. No. 1125.

Is annual influenza immunization worthwhile in industry? Consult Abst. No. 1127.

Abst. No. 1129 reports on cardiovascular mortality among American Negroes.

Experimental cutaneous chrome ulcers in guinea pigs is the topic of Abst. No. 1133.

Consult Abst. No. 1135 for details on food "poisoning" due to sodium nicotinate.

Abst. No. 1140 is concerned with estimating recent carbon monoxide exposures.

Hard metal disease is discussed in Abst. No. 1158.

See Abst. No. 1159 for information regarding protective clothing as a factor in the dust hazard of potters.

Abst. No. 1163 reports on an 18-year study pertaining to occupational exposure to Hi-Sil and Silene.

Experimental silicosis: A quantitative study of dust mobilization is the topic of Abst. No. 1169.

For a description of the restoration of hearing by surgical procedures consult Abst. No. 1173.

See Abst. No. 1180 for a tentative method for the determination of elemental phosphorus in air.

Details on the determination of iron in dustfall samples are given in Abst. No. 1183.

The fundamental philosophy and evolution of workmen's compensation laws are detailed in Abst. No. 1194.

FOUNDATION FACTS

DR. H. H. SCHRENK, attended a meeting of the Pennsylvania Air Pollution Commission in Harrisburg last month.

WILLIAM J. SCHREIBEIS, represented the Industrial Hygiene Foundation at the National Conference on Air Pollution in Washington, D.C. this month.

28th ANNUAL MEETING
OCTOBER 23 - 24, 1963

THE STAFF OF INDUSTRIAL HYGIENE FOUNDATION EXTENDS HEARTIEST
WISHES FOR A HAPPY HOLIDAY SEASON AND FOR A PROSPEROUS AND
HEALTHFUL NEW YEAR

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INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

1100 AAAS Annual Meeting.

The 129th meeting of the American Association for the Advancement of Science will be held at the Warwick Hotel, Philadelphia, December 26 to 29. A feature of the meeting will be sessions of Section C, Chemistry, which will include 9 papers in general sessions, 6 on nuclear and radiochemistry, 8 on techniques of structural chemistry, and 8 on advances in organic chemistry. A scientific and engineering manpower conference will be held all day December 28. Sponsors are the National Science Foundation, National Academy of Sciences, Scientific Manpower Commission, the Engineering Manpower Commission of Engineers Joint Council, and the AAAS Section M (the engineering section). Section O, Agriculture, will feature a symposium on Food Quality as Affected by Production Practices and Processing. About 1800 papers will be presented during the entire AAAS program, representing about 2500 authors reporting recent developments in all branches of science.-- Chem. Eng. News

1101 Meeting of National Conference on Standards.

The National Conference on Standards will be held February 18-20, 1963 at the Biltmore Hotel, New York. Industrial Noise Control for the American Family will be one of the nine subjects to be considered. The theme of the Conference is "Voluntary Standards--The American Way." Program information may be obtained from the American Standards Association, 10 East 40th Street, New York 16, N. Y. -- Am. Ind. Hyg. Assn. J.

1102 Bureau of Mines Designs Incinerator.

An incinerator that permits safe burning of solid waste materials contaminated with low level radioactivity has been designed by the Bureau of Mines, Pittsburgh, Pa. The incinerator efficiently burns items such as clothing, animal tissue, wooden and paper containers, and similar materials contaminated by exposure to radiation. Heated air fed near the top of the incinerator flows rapidly down the wall of the vessel to the base where the material to be burned is placed. Combustion is started and sometimes sustained with a gas-firing system. Gases formed from the burning waste are water scrubbed and filtered twice before exhausted. Ash from the burned material, which now holds the bulk of the radioactivity, is removed and stored in metal containers for disposal. -- Chem. Eng. News

1103 Air Pollution Report.

In 1960, Congress directed the Surgeon General of the U.S. Public Health Service, to conduct a study and report back to Congress the status of knowledge of the effects of motor vehicle exhaust fumes on the public health. This responsibility has been met and the report, titled Motor Vehicles, Air Pollution, and Health, was recently presented to Congress by Surgeon General Luther L. Terry. This 459-page report is the result of two years of intensive research and much of it is based on studies still in progress. It indicates clearly that pollutants from motor vehicles have harmful effects on man, livestock, and vegetation. Copies of the report are now available from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., at \$1.25 each. -- Am. Ind. Hyg. Assn. J.

1104 Importance of Chest X-Ray Examinations.

The importance of frequent chest x-ray examinations for detecting lung cancer in men over 50, and of early surgery for anyone with a lung lesion suspected of being cancerous, is emphasized by findings from Veterans Administration research. More than 70 VA and Armed Forces hospitals pooled information for a study of 900 male patients who underwent surgery for a single nodule in a lung.

-- J. Am. Med. Assn. Washington News

OCCUPATIONAL DISEASE STATISTICS

1105 Occupational Disease Statistics. (Cases reported to the respective Health Departments.)

	Conn. Sept.	Ind. July-Oct.	Pa. Oct.-Nov.	Total
Angiomatosis (retinal)			1	1
Beryllium poison			1	1
Carbon tetrachloride poisoning of the liver			1	1
Dermatitis	16*	3*	26	45
Fumes (unidentified)			1	1
Lead poisoning			3	3
Pneumoconiosis			37	37
Pneumoconiosis (suspected)			4	4
Silicosis		1	7	8
Silicosis (suspected)			3	3
Silico-TB		3	2	5
Silico-TB (suspected)			1	1
Totals	16	7	87	110

* Connecticut: Occupational dermatitis due to plants, poison ivy, 4; occupational dermatitis due to oils and greases (and metal cutting compounds, 3; occupational dermatitis due to solvents, 1; occupational dermatitis due to other chemicals: multiple chemicals 3, synthetic resins or resin (plastic) compounds 2; occupational dermatitis—other: fiberglass 1, soaps or detergents 2.

* Indiana: Epoxy resins, 1; vinyl, 1; rust inhibitor, 1.

COMING EVENTS

1963

- 1106 Jan. 13-18 American Chemical Society, 143 National Meeting, Cincinnati, Ohio
 Jan. 18 American Society of Facial Plastic Surgery, New York, N. Y.
 Jan. 20-25 American Academy of Orthopaedic Surgeons, Bal Harbour, Miami Beach
 Jan. 21-24 International Symposium on Advances in Gas Chromatography, Houston, Tex.
 Jan. 24-25 10th Annual Meeting, Western Spectroscopy Assoc., Asilomar, Calif.
 Jan. 28-Feb. 1 International Research Symposium on Gas Chromatography, University of California, Los Angeles
 Jan. 28-31 16th Annual International Symposium on Modern Methods of Analytical Chemistry, Louisiana State University, Baton Rouge, La.

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LEGAL DEVELOPMENTS

1107 New York City Drive Against Air Pollution from Incinerators.

Apartment house owners and superintendents are being notified by Commissioner Arthur J. Benline of the Department of Air Pollution Control of the Department's continuing drive against pollution from domestic incinerators. Building owners have an obligation to instruct their superintendents, janitors, and porters in the principles of incineration operation and maintenance. Smoke, fly ash, and odors adversely affect the buildings in which the incinerators are located, just as they do adjoining buildings, by creating costly cleaning problems, discomfort to tenants, and they are a health menace. Commissioner Benline offers to send the Department's leaflet, "Tips on Incinerators", in either English or Spanish, free of charge, to any landlord or tenant who requests it from: Publications, Department of Air Pollution Control, 15 Park Row, New York 38, N. Y. -- J. Air Poll. Control Assn.

1108 FDA Prepares Regulations for Batch Certification.

The Food and Drug Administration is getting a flying start on preparing regulations for batch certification of all antibiotics, as required by Food, Drug, and Cosmetic Act amendments approved at the last session of Congress. Under the new law, individual batches of all antibiotics must be certified by the Food and Drug Administration before they can be released for use; under the old law, batch certification was required for only 5 antibiotics—penicillin, streptomycin, chlortetracycline, chloramphenicol, and bacitracin. Although the new test requirements will not go into effect until May 1, 1963, FDA is urging all antibiotics makers to submit promptly all process details on the production of these drugs. FDA says prompt action will give it plenty of time to work out test details and will prevent delay when the new law is scheduled to take effect. -- Chem. Eng. News

1109 FDA Drive Against "Air Purifiers".

The Food and Drug Administration has launched a new enforcement drive against false claims that so-called "air purifiers" are good for treating or preventing diseases. Consumers were warned not to spend their money for such gadgets in the expectation that they will be beneficial for hay fever, asthma, colds, sinus trouble, migraine, allergies, lung cancer, pneumonia, and a long list of other conditions. One hundred eighty-seven units of 5 different brands of "negative ion generator air purifiers" were seized in October as false and misleading claims. -- J. Am. Med. Assn. Washington News

BOOKS, PAMPHLETS AND NOTICES

1110 Final Report. Age and Sex Differences in Pure-Tone Thresholds from 18 to 65 Years. Research Bull. No. 25. J. F. Corso. 61 pp. (Jan. 1962). AVAILABLE FROM: Department of Psychology, The Pennsylvania State University, University Park, Pa. PRICE: Not given.

This report summarizes the results of a hearing survey conducted in State College, Pennsylvania from 1952 to 1962. The purpose of the survey was to evaluate the effects of age and of sex on pure-tone thresholds for a sample of subjects selected from a population exposed to minimal levels of industrial noise. Audiometric measurements from 250 to 8000 cps were made on 912 subjects divided into 6 age groups: 18-24, 26-32, 34-40, 43-49, 51-57, and 59-65 years, inclusive. The data were analyzed at each frequency by age groups,

by ears, and by sex in terms of 3 types of distribution: (1) original distributions which contained the data for all subjects selected for the study; (2) screened distributions which contained the data only for subjects who passed a set of rigid screening criteria related to otological disorders and extent of noise exposure; and (3) truncated distributions which contained only data ± 15 db from the mode of the screened distributions. The results of this study indicate that, in general, there are only minor differences (less than 5 db) between the average sensitivity of right and left ears. However, the hearing of women is, on the average, more acute than that of men and shows less intersubject variability, except in the 51-57 and 59-65 year old age groups. In these groups, the women have poorer hearing and greater variability at the lower frequencies, i.e., at least below 1000 cps, while the men have significantly poorer hearing and greater variability at least from 3000 cps and above. The differences between sexes are most marked at the higher frequencies, with the cross-over point in the region of 1000 cps.

-- Cond. from author's abstr.

- 1111 Safety in Industry. Mechanical and Physical Hazards No. 5. Mechanics for the Safety Man. Bull. No. 239. U.S. Department of Labor, Bureau of Labor Standards. 21 pp. (1962). AVAILABLE FROM: Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. PRICE: 15 cents.

This new 21-page bulletin, prepared by the Labor Department's Bureau of Labor Standards, explains why the laws and principles of mechanics are important to the safety man. Consciously or unconsciously, the safety man applies some of the laws or principles of mechanics in his day-to-day work of preventing accidents. In most cases, this is done without realization that a specific law or principle is involved, the action taken being dictated by custom or established practice. This bulletin, one of a series on Safety in Industry, is intended to provide background information to relate current practices to the mechanical laws or principles involved, and of much greater importance, to implant in the safety man's mind the idea that such laws or principles may be useful in solving other problems in industrial safety which may come to him for attention. The bulletin discusses some of the important laws as applied to both statics and kinetics and shows their application to specific problems.

- 1112 Medical Care Under Workmen's Compensation. Bull. No. 244. E. F. Cheit, U.S. Department of Labor, Bureau of Labor Standards. 113 pp. (1962). AVAILABLE FROM: Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. PRICE: 40 cents.

This report, which presents an analysis of the medical care provisions of workmen's compensation laws in the United States and the methods of administering these provisions, is one of a series of studies planned by the Bureau of Labor Standards on administration of workmen's compensation laws in the United States. It is hoped that the information and conclusions presented in this publication will be helpful to workmen's compensation administrators, state legislators, and others in their efforts to improve the medical care for workers injured in the course of their employment, and so to effectively rehabilitate them and more promptly restore them to employment.

-- Cond. from Forward

- 1113 Health Statistics from U.S. National Health Survey. Series No. B-37. Persons Injured by Detailed Type and Class of Accident, United States, July 1959-June 1961. U.S. Department of Health, Education, and Welfare, Public Health Service, PHS Publication No. 584-B37. 51 pp. (Oct. 1962). AVAILABLE FROM: Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. PRICE: 40 cents.

Data collected in the Health Interview Survey during the 2-year period, July 1959 through June 1961, show that on the average 45 million persons per year sustained injuries requiring medical attention or causing restriction of usual activities for a day or more. The figures relate to the civilian, noninstitutional population of the United States. The annual rate was 255 persons injured per 1,000 population. Corresponding rates for males and females were 301 per 1,000 and 212 per 1,000. Injuries sustained by children of school age and by young adult males were chiefly responsible for the sex difference. The total rate of 255 persons injured per 1,000 population per year, based on the estimate of 45 million persons injured, included 27 persons per 1,000 population injured in motor vehicle accidents

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(moving and nonmoving), 46 persons in accidents "while at work", 107 persons in home accidents, and 73 persons per 1,000 population in accidents classified in the "other" category, which consists principally of therapeutic misadventures, and accidents occurring in public places such as schools, places of recreation, stores, and offices. The remaining 2 persons per 1,000 population were injured in accidents of "unknown" class. Among the total persons injured, 12 million, or 27%, were involved in accidents described as falls. About 4 million of these accidents resulting in injury were falls on stairs, steps, or from a height. Approximately 23% of the 45 million persons injured had one or more days of bed disability associated with the injury.

INDUSTRIAL MEDICAL PRACTICE

- 1114 The Beginnings of Industrial Medicine in England. H. Buess. Brit. J. Ind. Med. 19, 297-302 (Oct. 1962).

Industrial medicine saw its tentative beginnings among the inquiring minds of the 16th century physicians such as Paracelsus. In the 17th century, reports of conditions in mines on the Continent prompted natural scientists at the Royal Society to initiate a research program into what we now know as mercurial poisoning. The latter part of the eighteenth century witnessed the change from domestic to factory industry with its noncomitant social, economic, and technological upheaval, resulting in great shifts of population away from the countryside to the towns. Men, women, and children were employed in the new factories in primitive, unhygienic conditions, and mill fever and illness generally were rife. It was against this background that Percival and Thackrah prompted no doubt in large measure by the conditions of child labor, inquired into, and made recommendations for, the improvement of hygiene in the factories, thus laying the foundations of industrial medicine as we know it today.

-- Author's abst.

- 1115 Guide to Small Plant Occupational Health Programs. American Medical Association, Council on Occupational Health. Arch. Environmental Health 5, 383-392 (Oct. 1962).

The objectives of any good occupational health program, whether it serves a plant of 50,000 employees or a plant of 50 or fewer employees, are the same; namely, those stated clearly in the American Medical Association statement on "Scope, Objectives, and Functions of Occupational Health Programs" and listed in the introduction of this guide. Activities undertaken to attain these objectives vary greatly, however, from one small plant to another. The small plant is likely not to be in a position to hire even a full-time nurse, let alone a full-time physician or industrial hygienist. Most small plants can obtain and afford the services of a physician and industrialist hygienist on a part-time or on-call basis, particularly through banding together with other plants and engaging such personnel cooperatively. Although the plant enjoys only a part-time service of a physician or the services of a nurse supervised by a physician, its occupational health program should include plant visits by the physician no matter how small the plant is. The individual physician, prohibited as he is in personally soliciting practice, should use the good offices of his local medical society in promoting small plant occupational health programs in cooperation with management, labor, and interested community agencies.

- 1116 Medical Services at Airports. A Study of the Need for Comprehensive Medical Programs at Large Airports. H. L. Reighard. Arch. Environmental Health 5, 344-357 (Oct. 1962).

The value of medical programs in improving the performance and effectiveness of employees in industry is well known and has been extensively demonstrated. Airport populations constitute sizable industrial communities. The nature of the operations conducted has important implications for the safety of air operations. Employers at the airport studied

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have attempted to assess their medical needs in various ways, but thus far none have provided more than a few of the basic elements of an effective occupational health program. Employers have demonstrated, in a number of ways, their interest in promoting the health and effectiveness of their employees by the means now available. The size of individual employee groups is generally too small to justify the establishment of a comprehensive medical program by a single employer. The nature of the employee population and the limited nature of medical services now provided are sufficient reasons to justify the establishment of a comprehensive occupational health program at the airport. An airport medical facility, primarily established for other purposes, should be most effective in providing the medical component of crash rescue plans and operations. A medical facility at a large municipal airport could be an ideal training site for civilian physicians pursuing a career in aviation medicine. Such facilities for civilians are not now available. Medical facilities should be established at airports to provide comprehensive programs of occupation medicine and for other related purposes.

-- Author's summary

- 1117 Use and Abuse of Physical Therapy in Industry. D. I. Abramson.
J. Occ. Med. 4, 680-690 (Nov. 1962).

Many of the commonly employed physical therapy modalities can be used readily by the general practitioner if he is willing to acquire a working knowledge of the field. This will enable him to prescribe the proper treatment and to supervise the regimen to be carried out by the physical therapist. It is necessary to emphasize that the responsibility for the therapeutic program and for any adverse results rests fully on the physician who initiates the treatment. Finally, it must be recognized that all physical therapy modalities are geared not merely toward the relief of pain or the increase in strength of local muscle groups, but primarily toward the goal of total rehabilitation of the patient. Residual capacities should be exploited through exercise and self-help devices, in order to make the individual less dependent on others for his daily activities.

-- Author's conclusion

- 1118 The Physical Examination in Industry: A Critique. T. G. Hanks.
Arch. Environmental Health 5, 365-374 (Oct. 1962).

The physical examination, carefully and selectively applied, has a restricted role in the majority of industrial operations. It is subordinate to selection based on skill, adaptability, and motivation, all of which are demonstrated chiefly after the fact, either by work-history elsewhere or on the job, as physical capacity should be in most situations. In occupational health and safety, it plays a distinctly subordinate role to other preventive measures, particularly to environmental control measures, safety training, and safety certification. It is easily subjected to abuse by physicians, paramedical, and lay personnel within and outside of industry. It is of comparatively little value in defense of industrial insurance claims. Its value to health insurance can be questioned on the record. In the physical examination lies the danger that, as a fetish, it obscures for industrial physicians the broad scope of occupational health and safety.

-- Author's summary

- 1119 The Preplacement Physical Examination in Industry. Its Values. E. P. Luongo.
Arch. Environmental Health 5, 358-364 (Oct. 1962).

There are certain benefits which accrue to people, their physicians, and to industry through preplacement examinations as part of the total preventive medical program in industry. These have been presented briefly. Programs must include the promulgation of environmental health and safety, as well as physical examinations. Each year companies prepare annual statements which report profits and losses for the period and reflect the company's standing in matters of investment in tools, equipment, buildings, and securities. Some companies are satisfied with this review of their activities. Others, including many in the oil and aircraft industry, feel that a company's greatest asset is its people. This important asset, people, cannot be looked upon as biochemical, statistical factors of production or objects of propaganda, but as human assets that must be maintained through application of principles of a good preventive occupational health program. The personal individual "touch" of good preplacement examinations in industry is an important part of such a program.

-- Author's summary

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- 1120 Developing a Company Psychiatric Program. R. L. Meineker.
J. Occ. Med. 4, 524-528 (Oct. 1962).

Despite strong testimony in favor of occupational psychiatry, its growth is meeting much resistance. Causes of this are discussed in terms of general social problems that delay utilization of psychiatry. Group dynamics and attitudes toward psychiatry in very large companies involved in research are contrasted with those in companies whose activities are more routine. Two objectives with respective methods of occupational psychiatry emerge: one is to get the most efficient operation from the employee group by environmental psychiatric approaches, and the other is to promote the health and happiness of the individual by clinical psychiatric service. While establishment of sound individual clinical psychiatric service in the medical department is probably the best way to initiate a company psychiatric program, it is good management that makes healthy industry. It remains for clinical psychiatry to ease resistance and pave the way for the environmental approach. Industrial problems wherein psychiatry can be helpful and suggestions on how psychiatry might simultaneously improve health and business profit through more constructive regulation of the working environment are enumerated.

-- Author's summary

- 1121 The Energy Expenditure of Coal Miners at Work. P. W. Humphreys and A. R. Lind with technical assistance of K. S. Sweetland. Brit. J. Ind. Med. 19, 264-275 (Oct. 1962).

This survey was intended to provide a basis of information on the energy expenditures for the main component tasks in coal mining, carried out at different rates and in different postures. Such information is frequently required for studies of the physiological effects of coal mining; these values reported in this paper were required in particular for studies intended to define thermal limits of the environment suitable for miners at non-mechanized coal faces, a situation where the metabolic heat produced makes up a large proportion of the total heat load of the individual. Regression lines have been drawn between energy expenditure and speed of shoveling for the miner working in different postures. When forced to work lying on the floor the man's energy expenditure dropped, but his coal output also dropped. Walking to and from the coal face along roadways of good height yielded energy expenditures comparable to those of treadmill walking, although generally slightly higher in value. Stooped walking generally increased the energy expenditure of walking, but to a smaller extent than was anticipated from previous laboratory work. Several time analyses of complete shifts from different collieries, in which the time spent at different tasks had been measured, yielded an average estimate of the energy expenditure for an 8-hour shift of 2,000 kcal.

-- Authors' abst.

- 1122 Blunt Injuries of the Abdomen. C. C. Guy. J. Occ. Med. 4, 535-539 (Oct. 1962).

It can be repeated that the problems involved in the diagnosis of nonpenetrating abdominal trauma often demand all of the abilities of the most experienced surgeon, particularly in the patient with multiple injuries. If exploratory laparotomy is undertaken, it must be thorough. In this paper an attempt has been made to outline somewhat concretely, if not dogmatically, the most important diagnostic and therapeutic principles in the management of abdominal injuries.

-- Author's conclusion

- 1123 Raynaud's Phenomenon of Occupational Origin. W. F. Ashe, W. T. Cook and J. W. Old. Arch. Environmental Health 5, 333-343 (Oct. 1962).

The histories, clinical findings, hand angiograms, and pathological description of arterial biopsies of 2 cases of occupational Raynaud's phenomenon are presented through the courtesy of the Saskatchewan Government and Eldorado Mines, Inc. -- Authors' summary

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IN RE: ABRAMS November 1962

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- 1124 Chronic Bronchitis, Asthma, and Pulmonary Emphysema. Statement of ATS Committee on Diagnostic Standards for Nontuberculous Respiratory Diseases. Arch. Environmental Health 5, 375-382 (Oct. 1962).

Because precise definitions and classifications have not been available, a tendency has developed for workers in separate disciplines to define these diseases differently by criteria selected from their specific frames of reference or by their particular methods of observation or by their particular methods of observation or techniques for measurement. The lack of widely accepted definitions and classifications has impaired communication, which in turn has retarded clinical and research progress. In the present article the terminology, classifications, definitions, and descriptions of chronic bronchitis, asthma, and pulmonary emphysema have been designed to facilitate communication and to promote understanding among those who are concerned with this group of diseases.

- 1125 Acute Upper Respiratory Disease in Industry. N. K. Weaver, W. J. Mogabgab and J. G. Lione. Arch. Environmental Health 5, 415-422 (Nov. 1962).

Acute upper respiratory illnesses were studied in 6,240 employees of a large southern oil refinery and petrochemical plant during the 4-year period, July 1957 to June 1961. These illnesses were the leading cause of disability absences, accounting for 301 absences per 1,000 employees per year. They caused 1,200 days of disability annually per 1,000 employees, representing 43% of all work-loss days for absences of 1 to 7 days and 15% of all days of disability. Attack rates, as measured by the number of absences and days of disability occurring monthly per 1,000 employees, varied seasonally, being low in summer and high in winter. Striking increases were noted during the period September 1957 to March 1958, and in February 1960 due to Asian influenza. Both disabling and nondisabling acute respiratory conditions affecting 250 salaried workers were tabulated and characterized by clinical type. Over-all annual rates varied from 966 to 1,268 per 1,000, and ratios of disabling to nondisabling conditions from 1:3.7 to 1:1.4. Afebrile acute coryza caused slightly over 50% of illness each year; the percentage of influenza (ARD) was 19% in 1957-1958, 4% in 1958-1959, and 17% in 1959-1960. Identification of viruses recovered from throat washings of patients with acute respiratory diseases revealed influenza A2 in 1957-1958 and February 1960. Agents recovered during 1958-1959 included adenovirus Type 7, Coxsackie A9, influenza B, herpes simplex, and parainfluenza Types 1, 2, and 4. The significance of acute upper respiratory illnesses as a cause of morbidity in industrial populations is analyzed. Factors relating to the development of multivalent vaccines which might result in their prevention and control are discussed.

-- Authors' summary

- 1126 Mineral Oil Pneumonia. A. Miller, et al. Ann. Internal Med. 57, 627-634 (Oct. 1962).

A case of extensive mineral oil pneumonia is described and the literature on the subject is reviewed. This is the first reported case in which the impairments of pulmonary function have been comprehensively studied. The physiologic findings include: (1) Markedly decreased vital capacity and pulmonary compliance, with increased residual volume and RV/TLC (residual volume/total lung capacity) ratio. (2) Decreased maximal breathing capacity with increased pulmonary airway resistance and air trapping. (3) Arterial oxygen saturation slightly reduced at rest and markedly reduced on exercise, with elevated $p\text{CO}_2$ and compensated respiratory acidosis. (4) Normal diffusing capacity of the lung for oxygen at rest and increased venous admixture. The physiologic findings are thought to result from the pulmonary fibrotic and bronchoinflammatory reactions to the aspirated mineral oil, and are consistent with the clinical and pathologic features of mineral oil pneumonia described in the literature.

-- Authors' summary

- 1127 Is Annual Influenza Immunization Worthwhile in Industry? G. H. Collings, Jr. J. Occ. Med. 4, 529-531 (Oct. 1962).

The effectiveness of influenza vaccine for prevention of type-specific disease is well established. Prior to epidemics, inoculation of industrial groups with type-specific vaccine will without doubt benefit industrial operations in most cases. The effectiveness and value of the use of influenza vaccine on a routine annual basis by industrial groups is

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questioned. Certainly if an industry elects to establish routine programs of this sort it should first consider the various factors peculiar to it which may have a bearing on results. It cannot be categorically concluded that such routine programs are beneficial to a degree that will offset their cost.

-- Author's conclusion

- 1128 Upper Respiratory Illness Vaccines. Perspectives and Trials. W. J. Mogabgab. Ann. Internal Med. 57, 526-537 (Oct. 1962).

Studies with new experimental respiratory disease vaccines have shown the feasibility of using multivalent vaccines in protecting against illnesses. Various monovalent and complex vaccines were investigated, but effectiveness was demonstrable with a single virus vaccine containing murivirus 1 and a complex vaccine containing influenza A2 and B1, parainfluenza 1, and murivirus 1. The latter vaccine in an industrial group afforded protection against a third of the illnesses that influenza vaccine alone did not prevent. Effectiveness of this preparation was probably due to the antigenicity of each component that stimulated the formation of homologous as well as heterotypic antibodies. Antibody response and field investigations with several other vaccines in university and industrial populations have been presented. Selection of viruses for a vaccine, methods of preparation, and current thinking regarding respiratory disease vaccines have been discussed.

-- Author's summary

- 1129 Cardiovascular Mortality Among American Negroes. G. Rose. Arch. Environmental Health 5, 412-414 (Nov. 1962).

Cardiovascular mortality statistics for American Negroes under the age of 65 reveal two outstanding peculiarities: for arteriosclerotic heart disease the female rates are relatively very high, and for hypertension in both sexes the rates are extremely high. It is postulated that the primary phenomenon may be the excess of hypertension. Some implications of this hypothesis are considered.

-- Author's summary

- 1130 Coronary Heart Disease in Refinery Employees. L. R. Byrd, Jr. and J. R. Thomas. J. Occ. Med. 4, 521-523 (Oct. 1962).

Most employees who have been absent because of coronary heart disease can, with preparation by proper conditioning, be safely returned to their previous regular jobs. The experience with 223 employees, 73 with coronary insufficiency, and 162 with coronary thrombosis, is reviewed.

-- Authors' summary

SKIN DISEASES AND BURNS

- 1131 Observations on Regeneration of the Skin Barrier. A. G. Matoltsy, A. Schragger and M. N. Matoltsy. J. Invest. Dermatol. 38, 251 (1962).

It is now accepted that the major barrier to penetration of chemical agents into skin resides in the stratum corneum. The question is, does it reside in the entirety of the stratum corneum, or in one specific portion (i.e. Szakall's membrane). The present study examines this question in a simple and direct fashion. The authors measured vapor loss from skin at various times after stripping skin with cellophane tape and correlated this with the histologic changes in serial biopsies in one subject. They found water loss very high immediately after stripping (8.6 mg./sq. cm./hr.). Within 24 hours the uppermost cells formed a parakeratotic barrier which slightly reduced water loss. However, not until 90 hours later, when the granular layer had re-formed, did the barrier approach normal (0.60 mg./sq. cm./hr.). The authors conclude that barrier renewal is a complex process which is not complete until normally keratinized cells are formed.

-- J. Occ. Med. Absts.

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- 1132 Impaired Vision after Prolonged Chloroquine Therapy. L. R. Sataline and H. Farmer. New Engl. J. Med. 266, 346 (1962).

This is a representative case report and review of a recently recognized toxic effect of chloroquine therapy. Chloroquine, widely used in the treatment of lupus erythematosus, polymorphous light eruptions, and rheumatoid arthritis, causes corneal infiltrates and, more rarely, retinal lesions with arteriolar narrowing and pigmentary degeneration of the retina and macula. The retinopathy (fortunately an uncommon occurrence) may result in permanent visual-field defects and virtual blindness. The more serious changes usually follow prolonged administration of chloroquine, but early symptoms of diplopia and "halos around lights" should alert the physician to possible ocular toxicity. The reported case is remarkable in that the patient was treated for only 15 months before severe visual-field defects developed; usually this change requires several years of therapy. The authors also mention that a tranquilizer, thioridazine (Mellaril), has caused similar retinal pigmentation.

-- J. Occ. Med. Absts.

- 1133 Experimental Cutaneous Chrome Ulcers in Guinea Pigs. M. H. Samitz and E. Epstein. Arch. Environmental Health 5, 463-468 (Nov. 1962).

A method for the experimental production of chrome ulcers in guinea pigs has been devised. Hexavalent chrome was ulcerogenic, while trivalent chrome was inactive. An "antichrome" agent abolished the ulcerogenic action of hexavalent chrome in vitro. However, in vivo its effect was slight and could be demonstrated only under certain conditions. Once the ulcer was formed none of the agents tested accelerated healing. -- Authors' summary

- 1134 Cold Vasodilation and Cold Acclimatization in the Hands of British Fish Filleters. J. D. Nelms and D. J. G. Soper. J. Appl. Physiol. 17, 444 (1962).

Fish filleters work 4-8 hours with one hand immersed in ice cold water. Eleven English filleters were compared with a control group of their countrymen from the same fishing port for their vascular reactions to hand immersion in ice water. The results indicated that the filleters' fingers did not become as cold as the controls' fingers; and their hands vasodilated much sooner than the controls'. Also there was evidence of acclimatization in that the filleters did not complain of pain, and there was little or no after-burning when their hands were removed from the water. The controls, on the other hand, noted extreme pain, general pallor and distress; several fainted and after-pain was significant and prolonged. The authors suggest that cold acclimatization in fish filleters is of occupational origin.

-- J. Occ. Med. Absts.

CHEMICAL HAZARDS

- 1135 Food "Poisoning" Due to Sodium Nicotinate. Report of an Outbreak and Review of the Literature. E. Press and Leona Yeager. Am. J. Public Health 52, 1720-1728 (Oct. 1962).

There is a rather widespread use in many states of the soluble sodium salt (sodium nicotinate) of nicotinic acid as an additive for both fresh and processed meats in order to help preserve the red color. In spite of the likelihood that the practice is widespread involving millions of pounds of meat annually, only a relatively small number of episodes with adverse symptoms of sudden cutaneous vasodilatation have come to light and 7 of these have been described in this paper. Although there has been no evidence to show that any permanent harmful effects, complications, or sequelae followed these symptoms (and thus the term food poisoning may not be literally correct), nevertheless the sudden onset of apparently unexplained acute flushing of the skin with sensation of warmth and itching is alarming to the patient and of concern to the physician. Moreover, long sustained doses of 3 to 6 grams daily of nicotinic

acid have been shown, at times, to be associated with impaired liver function, abnormal carbohydrate metabolism (as reflected by glucose tolerance tests), elevated blood uric acid levels and recurrent unpleasant vasodilatation and occasionally gastric symptoms. A wide variety of additives, preservatives, vitamin supplements, flavoratives, coloring agents, and so forth, have been added to food for many years. In general, most of these additives appear to be beneficial and, indeed, if it were not for the use of many chemical fertilizers, insecticides, herbicides, etc., our food could be seriously threatened. The principles of the addition to food, both fresh and processed, of preserving or fortifying agents in amounts that can be shown not to be harmful is a sound one. However, in the opinion of the authors, the use of such additives should be properly controlled and regulated in order to avoid misuse, and the product in which it has been used should be properly labeled or some other method of making the consumer aware of the additive should be utilized.

-- Cond. from authors' summary

- 1136 Experimental Studies in Metal Carcinogenesis. Chromium, Nickel, Iron, Arsenic.
W. C. Hueper and W. W. Payne. Arch. Environmental Health 5, 445-462 (Nov. 1962).

Experimental evidence indicates that hexavalent and trivalent chromium possesses carcinogenic properties. Highly water-soluble trivalent and hexavalent chromium compounds when brought in contact with tissue at frequent intervals and in low concentrations to avoid significant corrosive effects are capable of producing cancers. The tumor yield obtained by repeated intratracheal instillation of suspensions of 3 carcinogenically highly potent chromates, calcium chromate, zinc chromate, and strontium chromate, was remarkably low and limited to the formation of sarcomas in the lung. Immunochemical investigations with chromium-protein complexes showed that such agents are capable of eliciting chromium-specific antibodies. Tests for the presence of immune bodies in the serum of chromate producers gave equivocal results. While powdered nickel implanted intrapleurally into rats elicited cancers in about one-third of the animals, intrapulmonary deposited nickel powder produced intrapulmonary sarcoma in only one of 34 rats. The inhalation of powdered metallic nickel in combination with sulfur dioxide by rats and hamsters did not give rise to lung tumors in any of 2 species studied suggesting that the combined action of a purely irritative chemical, such as sulfur dioxide, with a carcinogen does not necessarily induce a carcinogenic response by the lung. Rats implanted intrapleurally with finely powdered chemically pure iron or fed arsenic dissolved in water or a 12% alcoholic solution did not develop any cancers in the target organs, i.e., the lung or mediastinum or the skin, lung, and liver, respectively.

-- Authors' conclusion

- 1137 Edetate Kidney Lesions in Rats. M. D. Reuber and G. C. Schmieler.
Arch. Environmental Health 5, 430-436 (Nov. 1962).

Lesions simulating "versene nephrosis" in human beings have been produced in rats with disodium ethylenediaminetetraacetate (Sodium Versenate or Na edetate). Rats were injected intraperitoneally with varying dosages of Na edetate, Ca edetate, or Pb edetate and killed at different time intervals. Some rats were given daily injections for 21 days and then killed 2 weeks after completion of the injections. Na edetate, in 400 and 500 mg. doses, produced severe hydropic degeneration of the proximal convoluted tubules of the kidney in all rats. Calcium disodium ethylenediaminetetraacetate (Ca edetate) in the 500 mg. dose produced only minimal focal hydropic changes in 58% of animals. The lesions had almost disappeared 2 weeks after the Ca edetate had been stopped. All rats given lead disodium ethylenediaminetetraacetate (Pb edetate) developed mild focal changes. The degeneration in the rats given Pb edetate was followed by regeneration of cells lining the proximal convoluted tubules. Lesions developed more slowly with lower dosages of Ca edetate and Na edetate and were reversible even though the injection of the drugs was continued.

03121147

- 1138 Proteinuria in Chronic Cadmium Poisoning. (2) The Applicability of Quantitative and Qualitative Methods of Protein Determination for the Demonstration of Cadmium Proteinuria. M. Piscator. Arch. Environmental Health 5, 325-382 (Oct. 1962).

The value of quantitative and qualitative methods for protein estimation in cases of proteinuria due to chronic cadmium poisoning has been studied by examining urine from 40 workers exposed to cadmium and from controls comprising 15 other metal workers and 10 personnel at the Institute of Hygiene, Karolinska Institutet—a total of 65 subjects. For quantitative estimations when the protein content is low, the amido-black method described by Heremans or a biuret method after precipitation of protein with Tsuchiya's reagent may be used. Trichloroacetic acid, the precipitation agent commonly used in quantitative estimations of urinary protein, is suitable only if used in a final concentration of 4% and if the precipitates are centrifuged at fairly high speeds. Estimated by the method employed, normal urine with diurnal volumes of about 1,000 ml. has a protein content of about 5 mg. %, with an upper limit of about 10 mg. %. The most suitable qualitative tests for examining cadmium proteinuria and other types of proteinuria with similar electrophoretic protein distribution are the trichloroacetic acid test and the Donaggio reaction. A combination of these 2 tests provides a fairly reliable method for differential diagnosis. Esbach's test, the boiling test, and the nitric acid test are unsuitable because they do not give a response unless the protein concentration is fairly high. None of these tests is specific for cadmium proteinuria, and other diseases which give rise to similar reactions must always be considered in the differential diagnosis.

-- Author's summary

- 1139 Rebreathing Estimate of Carbon Monoxide Hemoglobin. J. D. Hackney, et al. Arch. Environmental Health 5, 300-307 (Oct. 1962).

Indirect methods of estimating carbon monoxide hemoglobin (COHb) fall into 2 groups: rebreathing and breath holding. Rebreathing methods have the advantage of requiring less subject cooperation and aid in sampling alveolar gas. Normal subjects rebreathed 4 liters of oxygen for 2 minutes. Samples of 25 cc. were analyzed for oxygen and carbon monoxide using gas chromatography. These results were substituted into the Haldane relationship (M value = 195). A total of 55 rebreathing estimates were compared with blood COHb measurements in normal subjects. There was good correlation between the estimated and measured COHb: Mean COHb 5.1%, the SD.22, coefficient of variation 4.4%. Using an assumed oxygen concentration may lead to large errors in estimating the COHb. Previous rebreathing methods have utilized nitrogen wash out or other time consuming approaches. The authors' method requires 2 minutes and appears to have greater sensitivity. Preliminary studies on chronic lung disease subjects are reported.

-- Authors' summary

- 1140 Estimating Recent Carbon Monoxide Exposures. A Rapid Method. A. Ringold, et al. Arch. Environmental Health 5, 308-318 (Oct. 1962).

A valid method for determining the carboxyhemoglobin level in the body has been developed. The method is based on the 20-second breath-holding method first described by Jones, et al. (J. Lab. Clin. Med. 51, 553 (Apr. 1958)), using an infrared analyzer first reported by Lawther and Apthorp (Brit. J. Ind. Med. 12, 326 (1955)). The authors' work shows that a poly vinyl bag can be used for collection of samples in the field. An application of this method is reported. This confirms the fact that cigarette smoking is a major factor in determining the carboxyhemoglobin level in a population. Pipe and cigar smokers appear not to have much increase in carboxyhemoglobin. The method should be suitable for studying the relationship of carboxyhemoglobin to occupational and to ambient air pollution exposures.

-- Authors' summary

03121148

- 1141 Lung Weights in Carbon Monoxide Deaths. M. Gregersen.
Danish Med. Bull. 9, 55-60 (Apr. 1962). (Danish Medical Bulletin, Ejnar Munksgaard, Noerregad 6, Copenhagen K, Denmark *).

Mital and Camps recently (1961) maintained that victims of rapid CO poisoning (mainly suicides) have higher lung weights than victims of more slowly-occurring CO poisoning (mainly victims of accidents). The series of autopsied cases of CO suicides available to the author was as yet too small for statistical analysis. Experiments on mice and cats did not suggest the presence of a difference in the relative lung weights of animals killed rapidly with a high concentration of CO and animals killed more slowly with a low concentration. Similar results were obtained when the lung weights were related to the "reduced" body weight (after removal of the gastrointestinal tract). The experiments indicated that the pulmonary edema in CO deaths partially developed post-mortem. A slightly higher CO saturation of the blood was observed in cats killed rapidly with a high CO concentration but this result, which was not confirmed in the mice, should be taken with some reserve. -- APCA Absts.

- 1142 Toxicological and Physiopathological Studies of Monobromotrifluoromethane (CF₃Br).
G. Paulet. Arch. maladies profess. 23, 341-348 (June 1962). French.

Detailed studies on mice, rats, guinea pigs and rabbits showed that CF₃Br had little acute or chronic toxicity. Above a threshold of 500,000 ppm some of the animals showed drowsiness, tremors and disturbances of equilibrium, but there were no deaths after 2 hours exposure at the threshold level. At 800,000 ppm with an oxygen concentration of 20% there were still no deaths, but when the oxygen concentration was reduced to 15% some deaths occurred in animals exposed to 800,000 ppm of CF₃Br, since hypoxia was added to the effects of the gas. When the gas was heated to 950°C, but not below that, it decomposed and became relatively toxic. The studies were made as the use of CF₃Br as a fire-extinguisher was under consideration. -- Bull. Hyg.

- 1143 Metabolic Effects of Chronic Ozone Exposure on Rats. J. A. Hathaway and R. E. Terrill.
Am. Ind. Hyg. Assn. J. 23, 392-395 (Sept.-Oct. 1962).

Young male rats were exposed to 0.8-1.5 ppm ozone 5 days per week for a period of 18 weeks, and various quantitative analyses of urinary constituents were done. A significantly lower titratable acidity and a higher pH was found in urine from test animals than from controls. Under a handicap of having narrow openings through which to obtain food, mean food intake and weight gain were consistently less in exposed than in control rats. When the openings were made uniformly larger, food consumption and weight gain were comparable in both groups. -- Authors' abst.

- 1144 Reaction to Toxic Beryllium Compounds: Terminology. Harriet L. Hardy.
J. Occ. Med. 4, 532-534 (Oct. 1962).

Knowledge at hand supports the concept that this disease (beryllium disease) is not exclusively a pathologic response in the lung to deposition of toxic beryllium compounds, and, hence, not a pneumoconiosis. Stress is laid on the value of using accurate nomenclature in describing the chemically-induced disease, beryllium poisoning. -- Author's summary

- 1145 Comparative Toxicity of Stable Rare Earth Compounds. II. Effect of Citrate and Edetate Complexing on Acute Toxicity in Mice and Guinea Pigs. J. G. Graca, F. C. Davison and Joyce B. Feavel. Arch. Environmental Health 5, 437-444 (Nov. 1962).

Intraperitoneal injections of rare earth chlorides, citrates, and edetate complexes in mice and guinea pigs produced graded toxic reactions in the animals in doses from 25 mg. per kilogram to 500 mg. per kilogram. Chloride toxicity was difficult to evaluate because of

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hydrolysis and precipitation at the site of injection with subsequent development of peritonitis. The citrates and edetate complexes are absorbed from the injection site and show a general pattern of decreasing toxicity from the lower to higher lanthanons. Gross and histopathological examination of bone marrow (sternal), liver, kidney, spleen, adrenals, sex organs, lungs, myocardium, and mesenteric lymph nodes indicate that lesions, when found, were similar for all rare earths. There appears to be a predilection for liver and kidney. Citrates produce an acute passive congestion of lungs and liver within 4 hours after injection, which is of a transitory nature. Renal changes are found later but not consistently. In general, the citrates were more toxic than the edetate complexes.

-- Authors' summary

- 1146 The Determination of Thallium in Urine. M. B. Jacobs.
Am. Ind. Hyg. Assn. J. 23, 411-414 (Sept.-Oct. 1962).

A variation of the triphenylmethane dye method for the determination of thallium has been modified to be suitable for analysis of urine samples in a small laboratory. Thallium is oxidized to the thallic state by bromine water, and is reacted with methyl violet for the colorimetric measurement. A maximum of 200 micrograms thallium per liter was found in the urine of 21 exposed individuals. Urine of unexposed persons showed virtually no thallium.

-- Author's abst.

- 1147 A Modification of the McCord and Zemp Method for the Determination of Lead in Urine.
A. Frank. Am. Ind. Hyg. Assn. J. 23, 424-430 (Sept.-Oct. 1962).

In the determination of the total lead content of urine by the dithizone method a large part of the analysis time is spent in ashing. McCord and Zemp described a method using "wet ashing", which shortened the ashing time to 30 minutes. The author, by using a modification of the above method, found that no loss of lead occurred as compared with a determination carried out with a longer ashing time. This method may be used for the analysis of urine from persons suffering from lead poisoning even after treatment with EDTA or penicillamine.

-- Author's abst.

- 1148 Toxic Properties of Dialkyl Nitrosamines and Some Related Compounds. D. F. Heath and P. N. Magee. Brit. J. Ind. Med. 19, 276-282 (Oct. 1962).

This paper is mainly a review, but it also includes observations which have not been published elsewhere. Some dialkyl nitrosamines are valuable chemical intermediates or solvents, and their use as insecticides has been suggested. In the present paper their toxic action is reviewed. Most results refer to rats. Their main acute effect is hepatic centrilobular necrosis, though lung lesions may appear. The compounds also induce tumors in liver, lung, and kidney. One, dimethylnitrosamine, has been shown to cause kidney tumors after a single dose. The necrotic and carcinogenic doses of the compounds are closely related. Analogous formamides are much less toxic (the LD50's in rats by intraperitoneal injection of dimethyl- and diethyl-formamides are 3,800 mg./kg. and 1,740 mg./kg. and they do not cause centrilobular necrosis or tumors. Nitrosamines are oxidized *in vivo* and by liver preparations *in vitro*. Their toxic action is due to the release of powerful alkylating agents in the liver. They also inhibit protein synthesis and alkylate liver protein and ribonucleic acid. In all cases the effective agent appears to be a metabolite. The possible hazard to man in the uses of these compounds is emphasized.

- 1149 A Study of Acrylonitrile Poisoning in Relation to Methaemoglobin-CN Complex Formation.
L. Magos. Brit. J. Ind. Med. 19, 283-286 (Oct. 1962).

Observations are recorded on methaemoglobin-CN complex formation in rats poisoned with acrylonitrile, potassium cyanide, and acetone cyanohydrin. In methaemoglobin-CN formation, the methaemoglobin level was increased by sodium nitrite. The results show that the rate of methaemoglobin-CN formation in rats killed by acrylonitrile is lower than in animals surviving potassium cyanide or acetone cyanohydrin poisoning, and much lower than in animals killed by potassium cyanide. These findings indicate that the toxicity of acrylonitrile cannot be solely due to the liberation of cyanide.

- 1150 Poisoning by Methyl Bromide and Its Treatment. L. Roche, et al.
Arch. maladies profess. 23, 379-384 (June 1962). French.

The authors describe in very great detail the course and treatment of 3 cases of methyl bromide intoxication, caused by exposure to fumes from fire extinguishers during work. In the first case the extinguisher had fallen down and emptied and in the other two the men were engaged in filling or handling extinguishers. The first patient suffered from convulsions, coma, and pulmonary edema and required tracheotomy together with rehydration, glucose saline infusions, cardiac tonics and antibiotics. He died on the 12th day. The predominant autopsy finding was degenerative cerebellar foci. The second patient had similar neurological manifestations. In addition to modern supportive treatment he was given hydrocortisone. At the end of a week he was no longer in danger, but neurological sequelae with electroencephalographic (EEG) changes, persisted for some weeks. The third patient did not develop convulsions or coma but developed dysarthria, ataxia, confusion, hallucinations and some EEG changes. His general condition returned to normal within a month, but two months later he still showed some slight residual ataxia. The authors stress the importance of modern methods of reanimation in such cases.

-- Bull. Hyg.

- 1151 Toxicity and Metabolism of Ortho-, Meta-, and Para-Terphenyls. H. H. Cornish, R. E. Bahr, and R. C. Ryan. Am. Ind. Hyg. Assn. J. 23, 372-378 (Sept.-Oct. 1962).

The study of the acute oral toxicity of ortho-, meta-, and para-terphenyl in rats resulted in LD50 values of 1900, 2400 and greater than 10,000 mg./kg. respectively. Thirty day feeding studies suggest that continued ingestion of these compounds may produce liver and kidney damage. Metabolic studies indicate that the major metabolites of ortho-, and meta-terphenyl are glucosiduronic acids and phenols. Para-terphenyl was poorly absorbed and a large portion is excreted unchanged in the feces.

-- Authors' abst.

- 1152 Measurement of the Exposure of Workers to Pesticides. W. F. Durham and H. R. Wolfe. Bull. World Health Organization 26, 75-91 (1962).

The work of the authors and their colleagues carried out over a number of years is brought together in this single fully-documented paper. The methods used to measure the exposure of workers using pesticides in different operations are discussed. Filters that can be attached to respirators for trapping either liquid or solid particles are described. The composition is given of pads suitable for picking up particles and droplets that may fall on the skin and clothing. This equipment can be worn by an operator doing his normal day's work. Details are provided to enable the investigator to calculate the amount of a pesticide spray that may come in contact with the skin of an operator. Tables give the quantities (mg./man/hr.) found to fall on the skin or be taken into the respiratory tract during a variety of operations such as spraying apples, checking cotton, indoor spraying, and exposure to aerial sprays. In 10 operations for which details are given, exposure to the skin exceeded by a factor of 10 to 1,000 that by inhalation. This important fact must be considered in designing safety measures when using pesticides.

-- Bull. Hyg.

- 1153 Observations on Workers Exposed to Sevin Insecticide: A Preliminary Report. E. M. Best, Jr. and B. L. Murray. J. Occ. Med. 4, 507-517 (Oct. 1962).

Over a period of 19 months a group of employees engaged in the production, handling, and shipping of Sevin (1-naphthyl-N-methylcarbamate) were observed and followed, both clinically and by laboratory analyses, for signs of cholinesterase inhibition. The urinary excretion of 1-naphthol, a metabolite of Sevin, was believed to show that it was being absorbed into the body. It was quite obvious that, in spite of housekeeping efforts, protective measures, and hygienic practices, certain employees were absorbing considerable amounts of Sevin dust. During the early stages of the study a screening-type blood cholinesterase activity test was used and the urine was analyzed for free 1-naphthol. It was decided that these procedures were not giving a true picture of the degree of exposure to, and absorption of Sevin and, during the latter half of the study, more definitive tests were employed. These consisted of a quantitative colorimetric determination of whole-blood cholinesterase activity and

urine analysis for total (free plus conjugated) 1-naphthol. When absorbed into the body, Sevin is metabolized and excreted, at least partially, as 1-naphthol. Relatively large amounts of 1-naphthol were excreted by employees exposed to air concentrations of Sevin ranging from 0.23 to 31 mg. of dust per cubic meter of air. Blood cholinesterase levels in exposed employees were mostly within the normal range and only occasionally slightly depressed. In no instance was there clinical or subjective evidence of increased acetylcholine activity among these employees. -- Cond. from authors' summary

- 1154 Methoxychlor in Eggs and Chicken Tissues. C. E. Olney, W. E. Donaldson and T. W. Kerr. J. Econ. Entomol. 55, 477-479 (Aug. 1962).

Both laying hens and growing chicks were fed 2, 4, 8, 10, 100, and 1,000 ppm of methoxychlor in their daily diet, the hens for 85 days and the chicks for 56 days, without adverse effect on egg production, feed utilization, maintenance of body weight or mortality. The insecticide was not detectable in the eggs at the lower feeding levels, but was readily found at the 100 and 1,000 ppm diets from the eighth day onward. It could no longer be detected in the eggs 14 and 28 days, respectively, after hens on the 100 and 1,000 ppm diets were returned to the control diet. Methoxychlor appeared in the fat and skin at the lower feeding levels and in the heart, gizzard, leg, liver and breast, as well as at the higher diet levels. Cessation of feeding of methoxychlor resulted in a relatively rapid decline of the insecticide in all tissues except the skin and fat. In these two tissues the level dropped to less than 0.05 ppm after 63 days. -- Public Health Eng. Absts.

- 1155 Accidental Poisoning from Agricultural Pesticides. A. Arnan. Bull. World Health Organization 26, 109-120 (1962).

This report, based on a dissertation for the London DPH, describes with many details the result of introducing economically valuable but otherwise dangerous materials into a relatively primitive community. The author is Medical Officer of Health for Beersheba, Israel. In a period of 12 months, 21 cases of poisoning from parathion with 7 deaths were recorded among a population of only 60,000, and of these 19 were in children under 15 years of age, indicating that the main hazard from a substance like parathion lies not in the field but in and around the home. Control measures taken are briefly described. The organization of facilities for diagnoses and treatment is given as well as details of the results of treatment of parathion poisoning with atropine and pyridine-2-aldoxime-methiodide which was made available after the first cases had been reported. In the account of the accidents attention is drawn to the presence of thallium DDT, dieldrin and other preparations "stored on shelves cheek by jowl with food articles." -- Bull. Hyg.

- 1156 Effects of Hyoscine and Meclozine on Vigilance and Short-Term Memory. W. P. Colquhoun. Brit. J. Ind. Med. 19, 287-296 (Oct. 1962).

An investigation was made of the effects of 1 mg. hyoscine hydrobromide and of 50 mg. meclozine hydrochloride on the performance of tasks of vigilance and short-term memory. In further trials the effects of these drugs were measured after ingestion of 32 g. ethyl alcohol. Efficiency was impaired by hyoscine taken alone, but meclozine alone had no significant effect. The effect of hyoscine was substantially increased by the presence of alcohol and under these conditions the effect of meclozine was equally great. The vigilance task appeared to be more sensitive to the effects of the drugs than the memory task, and possible reasons for this are considered in the discussion. -- Author's abstr.

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INDUSTRIAL DUSTS

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- 1157 Optimum Conditions for the Colorimetric Microdetermination of Silicon. J. Tuma. *Mikrochim. Acta* No. 3, 512-523 (1962). (*Mikrochimica Acta*, Springer-Verlag, Moelkerbastei 5, Wien 1, Austria*).

The best conditions for the formation of B-silicomolybdic acid and its reduction to molybdenum blue, in the presence of phosphate, iron, and some other interfering substances have been critically investigated to ascertain the most suitable method for the precise colorimetric microdetermination of silicon in biological material and minerals. The method of King and Stacy (1955) was modified by lowering the initial and increasing the final concentration of sulfuric acid, by securing the same electrolyte concentration in sample and standard and by lengthening the time allowed for reduction of the B-silicomolybdic acid. These improvements diminish the interfering effect of phosphate and iron and stabilize the molybdenum blue color. The proposed method permits determination of 20-50 micrograms of SiO_2 in the presence of up to 4.5 mg. of phosphate and 3 mg. of iron, with an accuracy of about ± 1 microgram of SiO_2 . Alkali fusion was found to be the most suitable way to produce the monomeric silicic acid solution necessary for the determination. Details of this method for determination of silica in tissues and minerals are described and some results are given.

-- APCA Absts.

- 1158 Hard Metal Disease. A. O. Bech, M. D. Kipling and J. C. Heather. *Brit. J. Ind. Med.* 19, 239-252 (Oct. 1962).

In Great Britain there have been no published reports of respiratory disease occurring among workers in the hard metal (tungsten carbide) industry. In this paper the clinical and radiological findings in 6 cases and the pathological findings in one are described. In two cases physiological studies indicate mild alveolar diffusion defects. Histological examination in a fatal case revealed diffuse pulmonary interstitial fibrosis with marked peribronchial and perivascular fibrosis and bronchial epithelial hyperplasia and metaplasia. Radiological surveys revealed the sporadic occurrence and low incidence of the disease. The alterations in respiratory mechanics which occurred in 2 workers following a day's exposure to dust are described. Airborne dust concentrations are given. The industrial process is outlined and the literature is reviewed. The toxicity of the metals is discussed and the authors' findings are compared with those reported from Europe and the United States. The authors are of the opinion that the changes which they would describe as hard metal disease are caused by the inhalation of dust at work and that the component responsible may be cobalt.-- Authors' abst.

- 1159 Protective Clothing as a Factor in the Dust Hazard of Potters. W. A. Bloor and A. Dinodale. *Brit. J. Ind. Med.* 19, 229-235 (Oct. 1962).

Investigations into the factors affecting dust concentrations in the breathing zone of pottery operatives have shown that cotton overalls constitute a serious source of dust. Attempts to overcome this difficulty by treatment of the material were not successful, so other types of materials were investigated. Terylene was found to have outstandingly desirable properties; types of "terylene" material and designs of clothing were defined. Factory tests showed that with this new protective clothing reductions of up to 65% in breathing zone dust concentrations were achieved. This type of clothing is now officially recommended by the Joint Standing Committee for the Pottery Industry.

-- Authors' abst.

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- 1160 Flax Workers' Byssinosis in East Scotland. D. H. Smith, et al.
Scot. Med. J. 7, 201-211 (May 1962). (Scottish Medical Journal, 5 St. Vincent Place,
Glasgow C2, Scotland*).

A brief history of byssinosis in flax workers is given together with a description of the processes used in the preparation of flax and how they differ in Scotland and Northern Ireland. A survey of respiratory symptoms was carried out in 3 flax mills. Ninety-four night workers were excluded. A questionnaire was completed on 452 (97%) of the remainder. Respiratory function tests were done on 8 persons with byssinosis and 8 matched control subjects. No environmental measurements are reported. Eighty workers (17.7%) had symptoms of byssinosis grade I or II. A further 106 (23%) were placed in an indeterminate group on account of occasional chest tightness or other symptoms on Mondays. A table of prevalence by length of dust exposure is given, showing that some workers develop symptoms within 6 months. No clear relationship between mill fever and subsequent symptoms of byssinosis was shown. The prevalence of bronchitis increased with the severity of byssinosis. A significant association was shown between smoking and byssinosis. -- Bull. Hyg.

- 1161 Farmer's Lung. Physiopathologic Features of the Acute Interstitial Granulomatous Pneumonitis of Agricultural Workers. J. Rankin, et al. Ann. Internal Med. 57, 606-626 (Oct. 1962).

Exposure to unusual quantities of moldy farm dusts occasionally results in an easily recognized disease with distinct clinical physiologic, and pathologic features. The characteristic syndrome seen in 73 agricultural workers consisted of chills, fever, and dyspnea within a few hours after exposure to moldy farm dusts and the subsequent development of a diffuse interstitial pneumonitis. Lung biopsies from 8 patients during the subsiding phase of the disease revealed a specific acute granulomatous interstitial pneumonitis. Characteristically, the sections showed epithelioid cells, poorly defined tubercles, and giant cells of the Langhans' type, together with thickening of the alveolar septa which also were infiltrated with plasma cells and lymphocytes. Physiologic studies revealed the equally characteristic syndrome of a stiff lung with a reduced diffusing capacity, and non-uniform distribution of regional ventilation and blood flow. The functional derangement correlated directly with the structural alterations seen in the histologic sections. The lesion is usually reversible, but progressive interstitial fibrosis occasionally will develop. This unique disease probably will be encountered frequently in rural areas where climate conditions necessitate the storage of large quantities of winter forage. -- Authors' summary

- 1162 Progress of Pneumoconiosis in a Pottery. W. Krauss.
Z. ges. Hyg. u. ihre Grenzgebiete 8, 18-38 (Jan. 1962). German.

This investigation was made to ascertain if factors apart from duration and intensity of exposure to dust played a part in determining the development, the course and progress of silicosis. Three hundred workers at the Kahla Pottery were grouped according to whether they suffered from silicosis (53), silicotuberculous (31), or were controls, with early exposure (57), or were healthy (159). They were also classified according to their exact occupations. The occupations varied greatly in the degree of exposure. Workers with the clay body were more exposed and suffered more readily than turners and much more than oven workers. The effect was not entirely dependent on the risk. Some of the oven workers showed a Stage III silicosis after a very short exposure, although in 10 oven workers with an equal exposure there was no disease. In the turners some workers had a Stage I silicosis after a much longer exposure than some who had a Stage III. These results show that workers may react differently to dust. It is pointed out that a familial and individual predisposition to dust may occur in the same way as there is a familial tendency to develop bronchitis. In the case of workers with silicotuberculosis the exposure is shorter than in silicosis; the disease frequently arises in people having a family history of tuberculosis. Silicosis itself may occur familiarly; out of 53 patients who suffered from silicosis 20 came from families where the father, mother, or sister had silicosis. External factors influence the course and progress

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of silicosis. The dust concentration and length of exposure are most important factors. Another influence in reducing the risk of both silicosis and silicotuberculosis is the breaking of the exposure time by intervals of non-dusty work. These pauses prolong the time over which exposure lasts and increases the resistance. -- Cond. from Bull. Hyg.

- 1163 Occupational Exposure to Hi-Sil and Silene. Report of an 18-Year Study.
E. R. Plunkett and B. J. Dewitt. Arch. Environmental Health 5, 469-472 (Nov. 1962).

The complete health records of 78 men employed in the manufacture and processing of Hi-Sil (hydrated silica pigments) and Silene (calcium silicate) in the period from October, 1941 to December, 1959, have been reviewed. Dust concentration during this period has ranged from 0.01 mg. per cubic foot to 5.77 mg. per cubic foot. No variation in incidence or type of injury sustained by these employees could be found. Injuries involving these compounds behaved no differently than similar injuries from other departments. No recurring illnesses or trends toward specific complaints could be detected in this group. Two men with long-term exposures were subjected to extensive physical examinations and pulmonary function studies and found to be normal. The report on one of these men is included. The x-rays for the group are consistently without change. No evidence of silicosis or other pulmonary disease was found. -- Authors' summary

- 1164 Silicosis in a Dental Mechanic. C. Ollagnier, et al.
Arch. maladies profess. 23, 385-386 (June 1962). French.

This paper describes very briefly the history of a dental mechanic in whom a bilateral nodular image was found at x-ray examination of the chest. The sputum was negative for tubercle bacilli, but the tuberculin reaction was weakly positive. The mechanic, in one stage of manufacturing artificial teeth, used an alloy of kaolin, silica and aluminum; and the final stages involved sand-casting and polishing. The patient was treated with PAS, isoniazid and streptomycin, and also given prednisone (to eliminate the possibility of sarcoidosis). The radiological image persisted and a provisional diagnosis of silicosis was made, subject to the effects of 6 months further antibiotic treatment. At end of 7 months treatment tomographic examination showed the nodulation to be stationary. Four gastric lavage specimens were sterile. -- Bull. Hyg.

- 1165 Reaction to Monkey Lung to Siliceous Dusts. G. W. H. Schepers.
Arch. Environmental Health 5, 278-299 (Oct. 1962).

Four monkeys exposed to quartz dust (6.87 mg. per cubic foot) for periods of 12, 18, 24, and 27 months developed progressive pulmonary granulomatosis, vesicular emphysema, interstitial fibrosis, bronchiolar and vascular occlusion, lymph node fibrosis and cor pulmonale. Inhaled Fiberglas-Plastic dust (4.6 mg. per cubic foot) produced in 5 monkeys, extensive peribronchial and perivascular koniophore infiltration without attendant fibrosis or cor pulmonale. In 5 monkeys exposed to amorphous silica (0.43 mg. per cubic foot), the main lesions present at the end of 12 months were pulmonary emphysema, alveolar wall sclerosis, vascular occlusion, and cor pulmonale. While the gravimetric values for these silica exposures were dissimilar, the surface area of the aerosols were almost identical. The tissue reaction to the 3 types of siliceous substances was not proportionate to either the weight, the surface area, the crystallinity, the physical form, or the chemical state of the siliceous particles. Cor pulmonale was attributable to the vascular damage plus emphysema in the monkeys exposed to quartz dust and to emphysema and alveolar wall destruction in the monkeys which lived in the submicron amorphous silica environment. The absence of cor pulmonale, despite the marked perivascular infiltration demonstrable in the monkeys subjected to the particulate Fiberglas-Plastic environment, remains unexplained. -- Author's summary

03121155

- 1166 The Diffusion Chamber in Experimental Silicosis. R. C. Curran and J. A. M. Ager. J. Pathol. Bacteriol. 83, 1-12 (Jan. 1962).

Diffusion chambers were made with filter membranes of widely varying porosities. The coarser-pore (0.65 micron or larger) membranes induced an acute inflammatory reaction, possibly by acting as a "trap" for polymorphs, and a dense fibrous capsule formed around them. It was also found incidentally that polymorphs and red cells can pass through 0.8 micron pores. Valvular chambers were constructed which allowed ingrowth of fibrous tissue. When this tissue was avascular, silica dust within the chamber exerted no effect upon it; when it contained capillary blood vessels, silica caused greatly increased fibrogenesis. It is suggested that this effect of silica was largely mediated through its ability to kill phagocytes and thereby release a permeability factor. The same mechanism would also explain the inflammatory effect of the filter membranes. -- APCA Absts.

- 1167 Properdin Levels in the Sera of Rabbits Exposed to Silica Dust Cloud. Gwen M. MacNab and I. Webster. Immunology 5, 461-466 (May 1962). (Immunology, Blackwell Scientific Publications, 24-25 Broad St., Oxford, England*).

The properdin levels in the sera of rabbits exposed to a silica dust cloud for 19 weeks were investigated. The results show a decline in the properdin titres of the experimental animals up to the sixth week of exposure. After the fourteenth week of dusting, it was observed that the properdin levels of the rabbits were restored to normal. The significance of these findings is discussed. -- Bull. Hyg.

- 1168 A Dust Dispersal Machine for Inhalation Experiments. A. M. Fisher and Helen Christie. Brit. J. Ind. Med. 19, 236-238 (Oct. 1962).

A machine is described that permits the controllable production of dusty atmospheres in which experimental animals may be exposed for extended periods. This is accomplished by diluting the dust with dense inert material from which it is subsequently removed without involving changes in the particle size or physical nature of the dust which it is desired to suspend in the atmosphere. -- Authors' abst.

- 1169 Experimental Silicosis: A Quantitative Study of Dust Mobilization. P. Gross, J. M. McNerney and Mary Ann Babyak. Am. Ind. Hyg. Assn. J. 23, 379-382 (Sept.-Oct. 1962). (Complimentary reprints available from Industrial Hygiene Foundation upon request.)

The intratracheal injection into tuberculin-positive guinea pigs of quartz dust combined with dead tubercle bacilli resulted in a lower mean pulmonary silica content than when the same amount of quartz dust was injected alone or in combination with weakly virulent living tubercle bacilli or tuberculin into other similar guinea pigs. The cause for the lower mean pulmonary silica content is related to the acute exudative phases of the inflammation set up by the dead tubercle bacilli. The edema associated with an acute exudative pulmonary inflammation causes mobilization and wash-out of intrapulmonary dust deposits. Neither tuberculin nor living tubercle injected with the dust produced a significant reduction in the silica content of the lungs because of the small dose of the former and the low grade character of the inflammation provoked by the latter. Each of these caused little edema and, therefore, scant mobilization of the dust deposits. -- Authors' conclusion

- 1170 Pulmonary Fibrosis and Encephalopathy Associated with the Inhalation of Aluminum Dust. A. I. G. McLaughlin, et al. Brit. J. Ind. Med. 19, 253-263 (Oct. 1962).

The clinical, radiographic, pathological, and environmental features of a case of extensive aluminum fibrosis of the lungs are reported in a man of 49 years of age who had worked for 13 1/2 years in the ballmill room of an aluminum powder factory. It is noteworthy that his

* Address not in current List of Periodicals.

symptoms were referable to the central nervous system, and that he died from terminal broncho-pneumonia following a rapidly progressive encephalopathy associated with epileptiform attacks. He had no presenting pulmonary symptoms, and x-ray examination of the chest showed only slight abnormalities. Radiographic examination of the chests of 53 other workers in the same factory and clinical examination with lung function tests of 23 of them revealed no other definite cases of aluminum fibrosis of the lung, nor any other cases with neurological signs and symptoms. Estimations of the aluminum contents of the body tissues such as the lungs, brain, liver, and bone are also recorded. When compared with normal values, it was found that the lungs and brain contained about 20 times and the liver 122 times more than normal. The results of a survey of the dust concentrations in the factory are also given. The use of aluminum compounds in the experimental production of epilepsy in primates is reviewed, and it is suggested that the neurological signs and symptoms with epileptiform convulsions which occurred in this case might have been related to aluminum intoxication. The authors hold the view, however, that the interstitial and nodular fibrosis found in the lungs was undoubtedly associated with the inhalation and retention of aluminum dust.

-- Cond. from authors' abst.

- 1171 Pleural Asbestosis. H. B. Eisenstadt. *Am. Practitioner Dig. Treat.* 13, 573 (Sept. 1962). (*American Practitioner and Digest of Treatment*, 227-231 South Sixth St., Philadelphia 5, Pa. *).

Because of the widespread industrial use of asbestos the number of persons suffering from asbestosis is increasing. Frequently the correct diagnosis is never established. Pleural asbestosis may occur with only minimum parenchymal involvement, and it may present itself as acute, chronic, or recurrent pleuritis or as pleural mesothelioma. Three cases were observed among oil refinery workers, one with recurrent pleurisy, one with pleural calcification followed by tumor formation, and one with primary mesothelioma. Only lung biopsy will establish the correct diagnosis. Pleural biopsy is nonspecific.

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

- 1172 Asbestosis and Carcinoma of the Lung. J. F. Cordova, H. Tesluk and K. P. Knudtson. *Cancer* 15, 1181 (Nov.-Dec. 1962).

Eleven cases of asbestosis associated with carcinoma of the lung are presented. A known exposure to asbestos dust was obtained in 7 of these cases. In 2 cases, evidence is presented for multifocal origin of the malignant tumor. The relationship of asbestos bodies as a carcinogen in the production of lung cancer is discussed.

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

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 1173 Restoration of Hearing by Surgical Procedures. F. A. Perri. *J. Occ. Med.* 4, 518-520 (Oct. 1962).

The author has determined that the stapes procedures, which are more extensive than mobilization procedures, are far more likely to produce a permanent return of auditory acuity to levels within acceptable social limits. In a few instances, the operation described has been performed on patients having a loss of hearing by bone conduction at or near the 30 db. level, with improvement shown audiometrically by air conduction and bone conduction.

-- Author's conclusion

* Address not in current List of Periodicals.

03121157

- 1174 Lighting Research. S. K. Guth. Am. Ind. Hyg. Assn. J. 23, 359-371 (Sept.-Oct. 1962).

Light and lighting are important production tools. Levels of illumination must be such that a worker can see his task in order to perform it quickly, accurately, safely, and easily. Furthermore, the brightness relationships in the entire work area should not detract from a worker's ability to see and should not produce discomfort. Today's lighting recommendations are based upon a great deal of research and increasing evidence of user benefits is supplementing and confirming the laboratory data. -- Author's abst.

- 1175 Health Hazards of Spraying Polyurethane Foam Out-of-Doors. J. E. Peterson, R. A. Cope-land and H. R. Hoyle. Am. Ind. Hyg. Assn. J. 23, 345-352 (Sept.-Oct. 1962).

Air samples were taken for toluene diisocyanate while two large storage tanks were being coated with sprayed polyurethane foam formulations. Results of these samples were used as the basis for definite recommendations concerning necessary protective equipment and "quarantine" areas around the structure being sprayed. -- Authors' abst.

RADIOACTIVITY AND X-RADIATION

- 1176 Storage and Excretion of Lead 210 in Dogs. S. C. Black. Arch. Environmental Health 5, 423-429 (Nov. 1962).

Exposure of beagle dogs to an atmosphere containing radon and its radioactive daughters and measurement of excretion of the resulting radiolead over a long period of time with tissue analysis at the end of the experiment leads to data which are presented in tabular form. Initial urinary Pb-210 excretion did not correlate with either the amount of radiolead deposited in lung or the amount of radiolead in whole body for these 2 types of exposure. However, the amount of radiolead stored in the skeleton was proportional to radiolead deposited in the lungs which, in turn, was a measure of lung radiation exposure. Since this experiment was performed to shed light on the use of urinary Pb-210 analysis as a means of judging the radon exposure of man, the question of the extension of these results on dogs to man needs to be briefly considered. A pertinent biological parameter is the tissue distribution of lead. Results on the dogs finds the skeleton to contain approximately 90% of the body content of Pb-210, whereas, for man, the skeleton is reported likewise to contain 90% of the body content of stable lead. The ratio of daily fecal excretion to the daily urinary excretion in these experiments has been cited as varying from 2.0 to 8.7 with an average of 5.1. For stable lead in man this ratio is cited as 2.5 to 6.7. The biological half-time for loss of Pb-210 from the skeleton of the dogs was 346 days. For man the biological half-time for whole body may be set on the basis of the loss of experimentally produced lead burdens at from 670 to 840 days, the precise number depending on interpretation. Without regard to such differences as may exist between man and dog and in default of the necessary data on man, the dog data constitutes the only present recourse. Since the mine dogs were exposed to the same type of atmosphere as a uranium miner would be, it is probable that 5% of the Pb-210 measured in a urine sample obtained from a working miner would come from the bone store of lead. This amount would represent approximately 0.05% of the skeletal Pb-210 which, in turn, represents 64% of the lead deposited in the lungs. -- Cond. from author's summary

03121158

- 1177 Radiation in New York State Industry. Trends in Utilization and Status of Health Protection, 1957-1962. A. Abrahams. Arch. Environmental Health 5, 473-478 (Nov. 1962).

An evaluation has been made of registration and enforcement data by the Division of Industrial Hygiene of the New York State Department of Labor for the first 6 years of operation under Code Rule 38. The following conclusions have been drawn: (1) There has been a steady over-all increase in the number of sources and installations during the period in which the code has been in effect. (2) The rate of increase in the use of small low-hazard sources has been much greater than that for high-hazard sources. (3) The principal industrial applications of ionizing radiation lie in quality control in production and in experimental research and development. (4) Of the total number of code violations recorded, 60% pertained to administrative requirements only. (5) There is no critical problem with respect to keeping exposures of personnel below permissible levels in normal routine operations. (6) Industry accepts the requirements of the code as reasonable and practicable and, on the whole, is in satisfactory compliance with its provisions. (7) There is a continuing need for further training of radiation safety personnel in the acceptable methods for performing surveys, monitoring personnel, and testing leakage.

-- Author's summary

ENVIRONMENTAL MEASUREMENTS

- 1178 Infrared Analysis of Air Contaminants Trapped on Silica Gel. D. S. Erley. Am. Ind. Hyg. Assn. J. 23, 388-391 (Sept.-Oct. 1962).

Many air contaminants in the parts per million range may be analyzed by infrared using long path-length gas cells. Because the spectrum provides a unique identification of the material(s) present, a single sampling technique can be used to analyze many different air contaminants. The method has been successfully employed to analyze halogenated aliphatic and aromatic compounds, alcohols, ethers and ketones.

-- Author's abst.

- 1179 Effect of Automobile Exhaust on Cell Growth in Vitro. D. E. Rounds, A. Awa and C. M. Pomerat. Arch. Environmental Health 5, 319-324 (Oct. 1962).

Conjunctival cells were exposed to an atmosphere of gaseous auto exhaust for varying periods of time, ranging from 15 seconds to 24 hours. This treatment was observed to produce a decrease in the total mitotic index and an increase in abnormal mitotic figures. This tissue was also treated with varying dilutions of chloroform-soluble constituents of auto exhaust with similar responses found in mitotic figures. In addition, the extract produced a marked stimulation in the growth rate, with the decrease in mitotic time apparently contributing to a decrease in the number of mitotic figures. Since mitotic events are interrelated with the rate of increase of the total cell population, it was concluded that an evaluation of the effect of auto exhaust on cell number can provide a simple, reproducible, and sensitive test system for estimating the relative concentrations of physiologically active components of automobile emissions.

-- Authors' summary

- 1180 A Tentative Method for the Determination of Elemental Phosphorus in Air. D. E. Rushing. Am. Ind. Hyg. Assn. J. 23, 383-387 (Sept.-Oct. 1962).

A method by which elemental phosphorus in air may be sampled and determined is described. Collected in xylene the elemental phosphorus is separated from the oxides by reaction with silver nitrate. The phosphorus is converted to phosphate and colorimetrically determined by the molybdenum blue procedure. About 1 to 2 micrograms per aliquot can be determined.

-- Author's abst.

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03121159

- 1181 Methods of Measuring Sulfur Dioxide, Dustfall and Suspended Matter in City Air, and Their Use in the Study of Air Pollution in Italy. F. L. Petrilli.
Bull. World Health Organization 26, 495-512 (1962).

This paper presents a comparative survey of the methods and apparatus used in Italy, particularly in Genoa, for measuring the 3 main components of city air pollution—sulfur dioxide, dustfall, and suspended matter. The most frequently employed devices for sampling sulfur dioxide are the lead-peroxide and volumetric apparatuses, as developed by the British Department of Scientific and Industrial Research. For the collection of dustfall, the British standard deposit gauge is widely used; in Genoa, a simple, low-cost type of dustfall collector has been tried in combination with that gauge, and good results have been obtained. The measurement of suspended matter is effected by the thermal precipitator, electrostatic precipitator, and konimeters of different types, in addition to the classic method of filtration through various media. In Genoa, suspended matter is monitored by automatic filter-paper samplers and directional samplers. The use of membrane filters for counting dust particles has proved particularly satisfactory. All these techniques are described in detail, and their results are subjected to statistical analysis.

-- Public Health Eng. Absts.

- 1182 Relation of Gustiness to Sulfur Dioxide Concentration. D. M. Baulch.
J. Air Poll. Control Assn. 12, 539-542 (Nov. 1962).

The data presented in this paper have shown significant relationships between the two most common gustiness classes, types B₁ and D, and SO₂ concentration. Although the simplification of this method may be criticized from a theoretical point of view, it is felt that the Brookhaven classification of gustiness provides a useful index of turbulence for this type of analysis. Further application and refinement of the method will be necessary, however, before it will be satisfactory for use in determining atmospheric diffusion on a routine basis. It is felt that effective application of this method of analysis could provide a useful tool for the development of a diffusion climatology for communities of all sizes. The economic advantages of utilizing gustiness data in addition to standard meteorological observations would make such a method especially valuable to smaller communities, for whom the cost of more extensive diffusion research is now prohibitive.

-- Author's summary

- 1183 The Determination of Iron in Dustfall Samples. R. G. Reynolds and J. L. Monkman.
Am. Ind. Hyg. Assn. J. 23, 415-418 (Sept.-Oct. 1962).

Many of the best spectrophotometric methods for iron have been 1, 10-phenanthroline. The introduction of the 4, 7-diphenyl derivative "bathophenanthroline" has increased the sensitivity possible and lessened interference. The procedure is essentially specific for iron and a concentration-extraction step permits the analysis of large aliquots of very low iron concentration. By using chloroform only one extraction is required.

-- Authors' abst.

- 1184 Evaluation of Air Particulate Sampling Equipment. C. D. Robson and K. E. Foster.
Am. Ind. Hyg. Assn. J. 23, 404-410 (Sept.-Oct. 1962).

Techniques used by the National Air Sampling Network for the collection of samples of suspended particulate matter for subsequent analysis are discussed. Sampling equipment, particularly the Hi-Vol sampler and a vacuum pump sampler using membrane filters for extended sampling periods, is described and data on sampler performance are presented.

-- Authors' abst.

03121160

PREVENTIVE ENGINEERING

- 1185 High Velocity Acid Mists Collection. R. W. Sexton.
 Am. Ind. Hyg. Assn. J. 23, 396-403 (Sept.-Oct. 1962).

Efficient collection of acid and chemical mists at high gas velocities has been obtained by the development of equipment that will function mechanically at gas flow rates to 850 feet per minute. The collector designed for multi-stage operation uses a concurrent liquid wetting system with countercurrent stage operation. Numerous conditions affecting performance were explored such as selection of suitable gas sampling equipment and controlled chemical feeding procedures. The investigation included studies with the following acids: sulfuric, hydrochloric, perchloric, acetic, phosphoric and chromic—as well as ammonia, chlorine gas, ethylenediamine and nitrogen dioxide. -- Author's abst.

- 1186 Recent Findings in the Field of Wet Dust Scrubbers. K. Semrau.
 Staub 22, 184-187 (May 1962).

The efficiency of a dust scrubber on a given dust or mist is dependent upon the power dissipated in the gas liquid contacting process. Efficiency increases with an increase in the power dissipation required to attain a given efficiency increase as the particle size of the dust or mist decreases. However, the efficiency is nearly independent of the size, design, and geometry of the scrubber, also of the method by which the power is applied to the contacting process. There are 33 references to the subject. -- APCA Absts.

- 1187 Why Test Method is Important in Rating Air Filter Efficiency. Anon.
 Heating Piping and Air Conditioning 34, 42-43, 216, 218 (July 1962).

Because of a lack of standardization in regard to methods used to test filters by various manufacturers, the purchaser has difficulty in determining the proper filter for the task. Filter efficiency may be expressed as a percentage by weight, or number of particulates, or by discoloration of the filter. To evaluate manufacturer's claims the type of dust, the point in the life of the filter, and the air velocity must be known. Since dusts are not uniform, there are factors which bias efficiencies by weight. Certain dusts agglomerate into much larger particles which tend to increase the efficiency rating. The discoloration test is based on methods developed by the National Bureau of Standards known as the Dust-Spot, Photometric, Dill Test, or Blackness Test. Samples of cleaned and uncleaned air are drawn onto filter papers and compared in a photoelectric tester. The photocells oppose each other on a galvanometer. By adjusting flow rates of the samplers a null is reached, and the efficiency of the filter is determined. Special tests involving DOP (dioctylphthalate smoke), jet or cascade impactor, radioactive dust or mist, and microorganism techniques are discussed. -- Public Health Eng. Absts.

03121161

COMMUNITY AIR HYGIENE

- 1188 An Air Pollution Rating Index System. S. Calvert.
J. Air Poll. Control Assn. 12, 185-186 (Apr. 1962).

The author proposes a simple indexing system to characterize both the magnitude of air pollution sources and the dispersing capacity of the air at specific source locations. The proposed source index is a quantitative measure of the seriousness of air pollution expressed in terms of the maximum rate of air flow which could be polluted by a given source. The proposed location index is a quantitative measure of the ability of the atmosphere to dilute pollutants between the source and the receptor. Both indexes are approximate as long as they are based on approximate data. The use of these, however, will constantly remind the user of the factors involved and will catalyze the gathering and evaluation of information regarding them. Several examples of the use of the method are given.

-- Public Health Eng. Absts.

- 1189 A Survey for Chronic Respiratory Disease in an Industrial City. Preliminary Results.
O. J. Balchum, et al. Am. Rev. Resp. Dis. 86, 675-685 (Nov. 1962).

A case-finding survey for chronic respiratory disease employing a questionnaire and pulmonary function tests was successfully accomplished in an industrial setting, combined with a chest roentgenographic program to detect tuberculosis suspects. The success of such a survey rests on the cooperation of the local government, the health department, management, and labor. This was obtained by informing and educating all associated and interested parties in the aims and methods and the reasons for carrying out the study. Seventeen per cent, or 245, of the 1,456 men to whom the questionnaire and breathing tests were administered in addition to obtaining the chest films were suspected of having chronic respiratory disease. This conclusion was based on the criterion of a 1-second forced expiratory volume below 70% of the observed vital capacity. A confirmatory study is being carried out in 75 subjects. Thirty-five of these were selected from those termed normal, and the remainder from those termed abnormal by the survey criterion. An immediate 100% follow-up study of tuberculosis suspects was completed through the health department in the area of the workers' employment.

-- Authors' summary

- 1190 Epidemiologic Studies of Air Pollution. R. J. Anderson.
Diseases of Chest 42, 474-481 (Nov. 1962).

Supplementing existing data which indicate an association between disease and air pollution, new epidemiologic studies provide evidence on the relationship of malignant neoplasms of the lung to air pollution, the distribution of deaths resulting from emphysema and the apparent increase in this disease, the relationship of asthmatic attack rates to air pollution as measured by sulfur dioxide, and the effects of air pollution exposure on pulmonary function in a normal population. Since epidemiologic studies cannot provide "cause-and-effect" proof, the author postulates that they must be supplemented by laboratory and other studies to strengthen the evidence. In order to establish "proof" that air pollution adversely affects human health one must have: (1) statistical evidence that a certain disease condition exists in the population; (2) epidemiologic evidence of the association between this disease condition and a certain factor or factors present; (3) laboratory demonstration that such factors can produce a condition in experimental subjects similar to be found in the population; and (4) the ultimate demonstration that protection from such factors will lessen the amount or severity of the disease condition.

-- Author's summary

03121162

- 1191 Dark Smoke During Unpredictable Load Changes. C. E. Billings and Philip Drinker.
J. Air Poll. Control Assn. 12, 324-325, 349 (July 1962).

Because of unpredictable changes in electrical load during operation of central steam electricity generating stations, and the inability of presently available combustion control equipment to match fuel and air rates continuously during rapid swings in load, a certain amount of dark smoke is unavoidable. Most large boiler installations contain a smoke density recorder and smoke alarm to indicate to operating engineers that combustion conditions are such as to produce dark smoke. This analysis was performed to evaluate quantitatively a proposed reduction in time in a metropolitan air pollution regulation from an allowable 25 minutes of dark smoke, greater than No. 2 Ringelmann, to 6 minutes. The effect of a proposed exception of 20 minutes for large power boiler installations with varying unpredictable load requirements as described was considered, also summer versus winter comparisons were made. Findings were based on analysis of records from one boiler burning pulverized coal at one station for a limited time, and as such cannot represent the total potential compliance or non-compliance with smoke emission regulations from other stacks.

-- APCA Absts.

- 1192 A Test Procedure for Motor Vehicle Exhaust Emissions. G. C. Hass and M. L. Brubacher.
J. Air Poll. Control Assn. 12, 505-509, 543 (Nov. 1962).

The California Motor Vehicle Pollution Control Board has developed a test procedure for motor vehicle exhaust emissions. The procedure comprises the operation of a vehicle on a chassis dynamometer, with exhaust constituents being continuously recorded with infrared instruments. The driving cycle was evolved from the 11 driving modes specified in the Standards for Motor Vehicle Exhaust set by the California Department of Public Health. The test procedure, as developed, has proved to be useful and workable for characterizing exhaust emissions from motor vehicles. The procedure has been found to be reasonably reproducible. Warm-up characteristics of catalytic afterburners have been compared between operation in the prescribed driving cycle on the chassis dynamometer and operation in actual urban driving. The warm-up characteristics using the driving cycle fall near the center of the range of warm-up characteristics encountered in metropolitan driving. The driving cycle used is inadequate for evaluating emissions of devices which incorporate by-pass systems or flow-modulating systems. These systems are highly sensitive to vehicle, driver, and route variables. Research is needed to further define these variables. Test procedures which are more capable of evaluating by-pass systems are being developed by the California Motor Vehicle Pollution Control Board.

-- Authors' conclusion

- 1193 Dynamic Irradiation Chamber Tests of Automotive Exhaust. Part II. Chemical Effects.
J. E. Sigsby, Jr., T. A. Bellar and Lois J. Leng.
J. Air Poll. Control Assn. 12, 522-523, 544 (Nov. 1962).

The primary variables studied in this system were concentration of reactants, fuel composition, and irradiation time. The authors found that the olefin and the olefin reaction products such as formaldehyde, are directly proportional to the amount of olefin present in the initial fuel. The degree of irradiation plays a strong part in the rate and equilibrium of olefin decay. The authors have likewise found that some of the aromatics above benzene have an effect intermediate between ethylene and the higher-molecular weight olefins. They have observed that the oxidant formation is to a large part independent of the concentration of the initial reactants. Average irradiation time is significant in any study of this nature although the total effect on products is not yet clear.

-- Authors' summary

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03121163

MANAGEMENT ASPECTS

- 1194 Workmen's Compensation Laws. Fundamental Philosophy and Evolution. T. C. Waters.
Arch. Environmental Health 5, 510-516 (Nov. 1962).

It should be borne in mind that the injured employee's first and in many cases his only contact with the administration of justice arises from his disputes in connection with injuries that he has sustained arising out of and in the course of employment. While he should receive full and complete sympathy, industry should not be burdened with the expense and cost of compensating any and every human ill that arises. Many of our state laws are outmoded, outdated, and deserve drastic revision. For many years there have been various governmental commissions in the state of Maryland which make recommendations annually to the state legislature dealing with proposed amendments to the compensation law. More states should follow this procedure and have the benefit of the advice of informed medical opinion with respect to many of the matters that may come up for consideration. Certainly none of the present laws are letter perfect. Their administration is not all that could be desired. From its standpoint industry today is fully health conscious and knows the value of good relationships with its employees in its concern for their health and welfare. Industrial accidents and industrial diseases can and should be promptly and properly compensated. Perhaps the real answer to these problems is to perfect processes of prevention so that industrial disputes arising out of compensation claims may not be of any concern either to employee or employer.

-- Cond. from author's conclusion

- 1195 Medical Aspects and Implications of Workmen's Compensation. M. N. Newquist.
Arch. Environmental Health 5, 505-509 (Nov. 1962).

Workmen's compensation is a slowly evolving socioeconomic program in which medicine is deeply involved. The burden of industrial injury has been shifted from labor to industry and indirectly to the consumer. The cost of compensation has stimulated accident and occupational disease prevention programs, all of which are of great value to both labor and industry. All of the goals of workmen's compensation have not yet been fully achieved, but in some respects it has far overstepped its original intent. Such deviations from the principles of workmen's compensation should be opposed. Imprecise language or lack of definition in the workmen's compensation statutes of some states permits liberal interpretations by administrative agencies and by courts and thus makes it possible to compensate for most any ailment of an employee and to socialize medicine further through the side door of workmen's compensation. Some employers made statements to this effect: "If we are going to have socialized medicine let's recognize it as such but have everybody pay for it." It would seem that a partial solution at least to restoring workmen's compensation to its original intent is to obtain more specific language in the statutes which will limit compensation to accidental injuries and occupational diseases which actually arise out of and in the course of employment. The medical profession should cooperate more actively with legislators to obtain compensation laws that are adequate and just and with administrative agencies which have the responsibility of carrying out the intent of the law, to assure the best possible medical care to the American workman should he be injured on the job.

-- Author's conclusion

- 1196 Illness-Absence Recording. Accurate or Inaccurate? J. S. Felton.
Arch. Environmental Health 5, 495-504 (Nov. 1962).

Industrial managers are concerned with the \$2,070,000,000 per year time loss brought about by absence from work caused by illness and injury. Clinical observers have commented on the inappropriateness of diagnostic classification systems and have questioned the reliability of reported and recorded diagnoses. Because of the unavailability of accurate

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substitutes, they utilize existing data. Sources of error in the recorded diagnoses of industrial illness-absence are to be found in (a) the status role of one disease over another as determined by the cultural milieu; (b) faulty communication between the sick employee and the company; (c) the accuracy of the attending physician's diagnosis; (d) absence of diagnostic information in the attending physician's report; (e) the psychologic orientation of the attending physician which determines whether a somatic or emotional designation is given to the illness; (f) rational differences in opinion between physicians; (g) the ineffectiveness of postabsence medical inspection or examination; (h) the variability of fitness for work as determined by the demands of the occupation; (i) inequities in recording of illness-absence, such as requiring reporting of long absences only. Records are rendered fallacious by the failure to identify individual periods of alleged illness as parts of a total life pattern. Inept work behavior is too frequently interpreted as physical illness. Improved systems of absence recording can result from (a) revision of sick leave policies which tolerate and encourage honesty; (b) a stronger health education effort based upon understanding of the principles of behavior; and (c) the re-education of managerial personnel in the skills of nurturing a sense of worth in their employees.

-- Author's summary

ACCIDENTS AND PREVENTION

- 1197 The Stud Gun--An Industrial and Public-Health Hazard. S. Mage and K. C. Sze.
New Engl. J. Med. 267, 1020-1022 (Nov. 15, 1962).

A powder-actuated tool fires a shot by an explosive discharge. Such a tool is the so-called "stud gun", which utilizes the power of a blank cartridge to fire metallic studs partially into a receiving part (concrete, steel, or wood) to permit the fastening of another part to it. The use of this tool is rapidly increasing in the building-construction industries. The injuries occurring with the use of the stud gun may be caused by ricocheting of the fired stud or by its actual penetration of the receiving part. The authors present two case reports illustrated with x-ray photographs of injuries resulting from the use of this device. The free-flying stud may strike the operator of the tool or a bystander. Such happenings may result from careless or inexperience of the operator, from improper harnessing and care of tools or from inadequate built-in safety devices. No license is required of an operator of the tool. To date, only 8 states and the District of Columbia have passed laws directly or indirectly concerning the use of powder-actuated tools. Besides the two cases described in this paper, a New York City ballistic expert has informed the authors of 6 fatal cases--clinically unreported--resulting from either cranial, thoracic or abdominal injuries caused by stud guns. The authors have found no references to the stud-gun injuries in the American medical literature. Two reports from foreign sources recorded 18 such accidents to industrial workers caused by ricocheting studs. The serious hazardous nature of the stud gun has gone unnoticed by the general public and the medical profession because it has not received sufficient publicity to prompt efforts to improve the inadequacy of current safeguards. The authors have reported their experiences to the New York State Department of Labor, which has manifested much interest in the problem.

- 1198 Steel Bullets Under Control. V. L. White.
Natl. Safety News 86, 26-27, 105-108 (Sept. 1962).

Much has been written about powder-actuated tools since they began to be noticed in industry about 1948. There were 2 California fatalities involving these tools in 1958 and another in 1961. Prior to 1958, 5 fatalities had been recorded. Most of them were caused by projectile ricochet, which is the major hazard related to such work, according to figures released by California's Division of Labor Statistics and Research. Eight others were caused by flying objects such as concrete particles or metal splinters, some of which may have been parts of studs. Except for flying studs and particles, the 1960 injury total was reasonably low.

There were no fatalities that year and 29 injuries compared favorably with a total of 41 in 1959. There were 27 injuries, including 2 fatalities in 1950 with less than one-tenth the tool activity that now exists—convincing evidence that worthwhile progress has been made. The author discusses safer tool design; safety regulations (in California); operator training; and teamwork on control.

- 1199 Some Health Hazards Associated with the Building Trades. M. Sheinbaum.
Am. Ind. Hyg. Assn. J. 23, 353-358 (Sept.-Oct. 1962).

Technological and advancement in building construction has produced some new modes of exposures to some traditional hazards, and has introduced several new types of hazards. Included are those from the use of various dusty materials in new processes, from new chemical products and solvents as they are used in construction, and from fuel exhaust. Recommendations are given for controlling hazards in the pneumatic application of sanded plaster and concrete grinding; in the use of epoxy and polyurethanes; in paint spraying; and in the operation of engines for materials-handling equipment and heaters for construction jobs.

-- Author's abst.

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