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Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL

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INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE -- PITTSBURGH 13, PA.

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INDUSTRIAL HYGIENE FEATURES

Modern concepts of diagnosis and treatment in occupational medicine are discussed in Abst. No. 508.

Abst. No. 513 investigates the evaluation and improvement of seats.

The role of the internist in the handling of multiple injuries is reported on in Abst. No. 514.

Abst. No. 517 is concerned with cor pulmonale: a disease of the whole heart.

Hypoglycemia and diabetes is the topic of Abst. No. 520.

Consult Abst. No. 522 for a discussion on industry and carcinogenesis of the lung.

Abst. No. 525 reports on carcinoma of the skin in machine tool setters.

For new concepts and future trends in toxicology see Abst. No. 529.

A toxicologist's view of threshold limits are presented in Abst. No. 531.

A present-day study of phossy jaw is given in Abst. No. 535.

Information on the anemia of lead poisoning is given in Abst. No. 539.

Consult Abst. No. 540 for data on the metabolism and excretion of trichloroethylene after inhalation by human subjects.

Improved membrane filter air sampling methods for environmental control are described in Abst. No. 545.

Abst. No. 552 presents a procedure for the separation and analysis of dust in lung tissue.

The effects of high temperature environmental conditions on human performance are described in Abst. No. 559.

For a study on the periodic health examination: evaluation of routine tests and procedures, consult Abst. No. 587.

FOUNDATION FACTS

27th ANNUAL MEETING - OCTOBER 24-25, 1962. The Legal Conference will be held on Wednesday afternoon, October 24, and will include:

1. Legislative Developments in Workmen's Compensation during the year, 1962 by Andrew Kalmykow, Mgr., Casualty Dept., Assn. of Casualty and Surety Companies.
2. Products' Liability—The New Bonanza, to be presented by Mr. James H. Pollard, Senior Home Office Liability Examiner of the American Mutual Liability Insurance Company of Wakefield, Massachusetts.
3. The Investigation and Preparation for Trial in Compensation Cases, to be presented by William C. Hartman, Attorney-at-Law, Cleveland, Ohio.

HERBERT T. WALWORTH, Director of Industrial Hygiene and Occupational Health for Lumbermens Mutual Casualty Company, and a member of I-H-F Engineering Committee received the Donald E. Cummings Memorial Award at the American Industrial Hygiene Conference in Washington, D. C. last month for outstanding contributions to the knowledge and practice of the profession of industrial hygiene.

DR. H. H. SCHRENK, the Foundation's Managing Director, attended a meeting of the Air Pollution Commission of the Commonwealth of Pennsylvania in Harrisburg on May 29. He also participated in a Seminar on Community Air Quality Standards held at The University of Michigan, June 11-14.

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INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

494 Occupational Medicine for Physicians.

Occupational Medicine, a full-time course for physicians, will be given for 8 weeks, from September 17 through November 9, 1962, by the New York University Post-Graduate Medical School. The course content covers the following areas: Preventive Medicine, including Epidemiology, and Biostatistics, Administrative Medicine, Occupational Diseases, and Industrial Hygiene. It is aimed at meeting the need for specialized training in industrial medicine. Didactic instruction will be supplemented with field trips to industrial plants, governmental agencies concerned with industrial health and to union health centers. Opportunity will be given to attend medical, surgical, and clinical-pathological conferences held in the New York University Medical Center. Tuition for the course is \$375 and field expenses are \$25. Further information is available from the Office of the Associate Dean, NYU Post-Graduate Medical School, 550 First Ave., New York 16, N. Y.

495 Workshop for Occupational Health Nurses. Co-sponsored by American Nurses' Association, Occupational Health Nurses Section, New York University, Department of Nurse Education.

The workshop, which will be held in New York City, October 22-26, 1962, is limited to 60 participants. Tuition is \$40. The subject content of the course is: Automation and the Worker's Health, Physiological and Emotional Responses, Social and Economic Forces, Working Hours and Productive Leisure, Coordinating Resources for the Health of Workers, Planning and Implementation with: Management and Labor, Other Disciplines: Engineering, Legal, Medical, Personnel Services, Social Work. Other community agencies, Environmental Factors Affecting the Health of Workers: Identification and Control On the Job and Off the Job, Human Behavior and the Counseling Process. Further information may be obtained from the American Nurses' Association, Occupational Health Nurses Section, 10 Columbus Circle, New York 19, N. Y.

496 Problems of Fallout.

The Armed Forces Medical Symposium held in Albuquerque recently tackled problems of local and world-wide fallout, and the general lack of information concerning it. Dr. Wright H. Langham, Los Alamos, leader of the biomedical research group, said radioactive materials injected high into the atmosphere take months and years to return to earth. A bomb as small as one megaton, barely reaching the stratosphere, will return radioactive materials in about a year. When radioactive clouds rise higher, it may take 6 years for isotopes to be returned. "And prediction on the effect of world-wide fallout is strictly a prediction and nothing more," he said, adding that the small increase in radiation from world-wide fallout will not be detectable for generations. Dr. Thomas L. Shipman, leader of the health division in the symposium said natives on Rongelap atoll suffered temporary hair loss and skin lesions after a 15-megaton blast over Bikini atoll. Still, he said they could have received twice and three times as much internal radiation "without difficulty". It is local fallout which would be lethal, Dr. Shipman reported. In the event of nuclear war, military targets would be favored, but indirect effects would be felt by civilians within a radius of several hundred miles. "The general public must have a reasonable understanding of fallout and with it can do to people potentially," he said.

03121030

497 Respiratory Ailments.

Increasing concern is being shown by medical and health authorities because of the rising incidence of chronic respiratory disease, the Metropolitan Life Insurance Company reports. Deaths from respiratory diseases have shown a sizable increase in the past decade, according to statisticians of the company. Combined mortality from chronic bronchitis, the chronic pneumonias, bronchiectasis and emphysema rose fairly steadily from about 5 per 100,000 population in 1949 to 10 per 100,000 in 1959. The rise in mortality was particularly rapid among males, statisticians said. The rate more than doubled among both white and non-white males during the decade, while among females the increase amounted to approximately 50%. Emphysema alone accounted for slightly more than half the total increase in deaths. The recorded death rate from this disease in 1958-1959 was 6 times that in 1949-1950. The only other disease to record a relatively large increase in mortality was chronic pneumonia. For chronic bronchitis, the death rate among white males at ages 45 and over rose by 11% between 1949-1950 and 1956-1957, reflecting chiefly the marked increases at ages 55-74, the statisticians report. Among white females, however, this rate dropped about 1/3 at ages 45 and above. During the same period, the death rate from asthma fell in each age group among both males and females. The overall increase in mortality attributed to the chronic respiratory diseases represents in part the growing proportion of people at the older ages, according to the report. The rise is also a consequence of the increasing number of people with persisting lung changes due to previous acute respiratory infections. -- J. Am. Med. Assn. Facts & Figures

COMING EVENTS

- | | |
|-----------------|---|
| 498 July 1-4 | International College of Surgeons' New England Regional Meeting, Bretton Woods, New Hampshire. |
| July 2-6 | Gordon Research Conferences, Coenzymes and Metabolism, Kimball Union Academy, Meriden, New Hampshire. |
| July 7-12 | American Society of X-Ray Technicians, Seattle, Washington. |
| July 9-13 | Gordon Research Conferences, Chemistry, Physiology, and Structure of Bones and Teeth, Kimball Union Academy, Meriden, New Hampshire |
| July 13-14 | Rocky Mountain Cancer Conference, Denver, Colorado. |
| July 16-20 | Gordon Research Conferences, Steroids and Other Natural Products, New Hampton School, New Hampton, New Hampshire. |
| July 17-20 | American Chemical Society, Division of Industrial and Engineering Chemistry, in Cooperation with Air Force Materials Central and University of Denver, 2nd International Symposium on Fluorine Chemistry, Estes Park, Colo. |
| July 30- Aug. 3 | Gordon Research Conferences, Medicinal Chemistry, Colby Junior College, New London, New Hampshire. |

03121031

OCCUPATIONAL DISEASE STATISTICS

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

	Colo. Jan.-Apr.	Conn. Mar.	Pa. Apr.-May	Tenn. Mar.-Apr.	Total
Ammonia poisoning				1	1
Bacterial infections	2				2
Bronchitis (chlorine)				1	1
Carbon monoxide poisoning	3	4			7
Carcinoma of the lung	1				1
Dermatitis	58	22 *	19	12	111
Fumes (unidentified)			3		3
Fumes (suspected)			1		1
Industrial solvents poisoning		2			2
Lead poisoning	2		2	2	6
Phosgene poisoning		1			1
Pneumoconiosis	5		51		56
Pneumoconiosis (suspected)			7		7
Respiratory irritation			1		1
Silicosis	1		43		44
Silicosis (suspected)			4		4
Silico-TB		2			2
Tuberculosis			1		1
Miscellaneous	22				22
Total	94	31	132	16	273

* Causes are listed as follows:

Connecticut: Occupational dermatitis due to oils and greases (and metal cutting compounds) 7; occupational dermatitis due to solvents 4; occupational dermatitis due to other chemicals: alkalies 1, ammonia 1, glues 1, miscellaneous 2, multiple chemicals 2, synthetic resins or resin (plastic) compounds 1; occupational dermatitis—other: fiberglass 1; miscellaneous 1, soaps or detergents 1.

LEGAL DEVELOPMENTS

500 Broader Regulations Under Pesticide Laws Put Into Effect By USDA.

The new rules, proposed earlier this year, cover pest control products now being marketed but not regulated. In addition to insects, rodents, nematodes, fungi, and weeds named as pests in the Federal Insecticide, Fungicide, and Rodenticide Act, the expanded regulations cover mammals, birds, fish, amphibians, reptiles, aquatic and terrestrial invertebrates, unwanted roots or other plant parts, and certain viruses. Manufacturers of new products designed to give protection against these pests must prove them to be effective and must register the labels with the U.S. Department of Agriculture before the products can be marketed in interstate commerce. Makers of products already on the market but not now regulated have until October 1, 1962 to register their products.

-- Chem. Eng. News

03121032

- 501 Status of State Legislation Related to Ionizing Radiation. Egilda D. Witherell and R. F. Cowing. Health Physics (London) 7, 17-19 (Dec. 1961).

State legislation as it pertains to ionizing radiation was studied. More than half of the states in the country have Radiation Protection Acts; many states are in the process of promulgating rules and regulations under the Acts. The educational process will be helpful in promoting an effective code, and training of qualified personnel to effectively carry out the laws will be needed.

-- Nuclear Sci. Absts.

- 502 Pernicious Anemia Preparations. Capsules 3, 1 (Apr. 1962). Available from: Woodard Research Corporation, P. O. Box 405, Herndon, Virginia.

The Food and Drug Administration proposes to tighten up regulations of preparations to treat pernicious anemia. So-called "intrinsic factor" products would be labeled for sale only upon prescription under a proposal published February 17th, in the Federal Register. The statement of policy would also require that any orally administered drug for the treatment or prevention of pernicious anemia bear a warning stating it is not a reliable substitute for injections of vitamin B₁₂ and that periodic examinations and laboratory tests are essential. Intrinsic factor is an unknown substance prepared from the intestines of food animals which increases B₁₂ absorption in the human stomach. FDA said orally administered preparations of vitamin B₁₂ and intrinsic factor may sometimes mask symptoms and interfere with the diagnosis of pernicious anemia. Only vitamin B₁₂ by injection is generally recognized as a wholly reliable treatment of the condition, the agency said. Intrinsic factor would also be regarded as a food additive under the Federal Food, Drug and Cosmetic Act, FDA said, and could not be used in foods because there is no covering food additive regulation.

- 503 Quinine in Carbonated Beverages. Capsules 3, 1 (Apr. 1962). Available from: Woodard Research Corporation, P. O. Box 405, Herndon, Virginia.

It is stated in the Federal Register of March 15, 1962, that after a study of a report of a scientific advisory panel appointed from a group of distinguished scientists recommended by the National Academy of Sciences and after evaluation of other material submitted to him, the Commissioner of Food and Drugs has issued an order regarding the use of quinine, which is essentially as follows: Quinine, as the hydrochloride salt or sulfate salt, may be safely used in carbonated beverages as a flavor in an amount not to exceed 83 ppm, as quinine. The label shall bear a prominent declaration of the presence of quinine either by the use of the word "quinine" in the name of the article or through a separate declaration.

BOOKS, PAMPHLETS AND NOTICES

- 504 Radioisotopes in Tropical Medicine. Proceedings of the Bangkok Symposium, December, 1960. International Atomic Energy Agency, Vienna. 379 pp. (1962). \$7.00 Available in U.S. from: The Unesco Publications Center, 801 Third Avenue, New York 22, N. Y.

This symposium on the use of radioisotopes in the study of endemic and tropical diseases, convened jointly by the World Health Organization and the International Atomic Energy Agency, brought together experts in the medical uses of radioisotopes and experts in tropical medicine. It began with a discussion of nutrition in tropical medicine by G. R. Wadsworth of the WHO. Extensive discussions took place which are recorded in this volume, together with the 20 papers presented. The papers originated in Australia, British West Indies, Ceylon, India, Kenya, the Philippines, South Africa, Tanganyika, Thailand, United Kingdom, U.S.A., Venezuela, and WHO. Also present for the discussions were representatives of Iraq, Pakistan, Portugal, Sweden, Vietnam and the United Nations Food and Agriculture Organization at Bangkok.

03121033

- 505 Workmen's Compensation and the Physically Handicapped Worker. U.S. Department of Labor, Bureau of Labor Standards. Bull. 234. 126 pp. (1961). Available from: Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. 40 cents.

Encouraging progress has been made in recent years to enhance the employment opportunities of disabled workers. Over the past 10 years, the 1,800 local officers of the Federal State employment service have placed more than 2.6 million qualified handicapped persons in suitable jobs. Yet, in spite of the great strides that have been made over the past decade by the President's Committee on Employment of the Physically Handicapped and other interested agencies in broadening the acceptance by employers of job-seeking handicapped workers in all fields on the basis of their ability, many employers are still reluctant to hire handicapped workers. This reluctance has been attributed in part to a fear of increased workmen's compensation costs. The U.S. Department of Labor's Bureau of Labor Standards undertook this study to ascertain the extent to which this fear of increased workmen's compensation costs is justified. In discussing the relative effects of the different types of state workmen's compensation laws on the employment of qualified job applicants with various physical impairments, this report points out State statutory provisions that appear to work to the advantage of both employers and their physical handicapped employees, as well as those statutory provisions that appear to be ineffective in encouraging the employment of job applicants with various physical impairments. Prior studies and surveys relating to this subject are reviewed and an analysis is also made in this report of the findings of a number of surveys made in 1960, including one of selected manufacturing employers from six states.

- 506 Safety in Industry. Environmental and Chemical Hazards. No. 3. Bull. 226. Respiratory Protective Equipment. U. S. Department of Labor, Bureau of Labor Standards. 34 pp. (1961). Available from: Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. 20 cents.

(See Abst. 528, IHD June, 1960). Efficient respiratory protective equipment is available to protect against many of the respiratory hazards encountered in industry. Unfortunately this equipment is not always used correctly, or the wrong equipment is used, and injury results. This bulletin, one of a series on Environmental and Chemical Hazards as related to Safety in Industry, is intended to provide information helpful in selecting and using the right protective equipment for a particular respiratory hazard. Of equal importance, the limitations of such equipment are also given.

- 507 New Technical Requirements for Family Shelters. Office of Civil Defense. Technical Manual 61-1,2. Available from: Office of Civil Defense, Washington 25, D.C.

In order to protect the public and ethical business firms, the Office of Civil Defense has established new technical requirements and procedures for evaluating family shelters. Minimum standards have been established for fallout shelters, blast-resistant shelters, limited blast-resistant shelters, dual purpose shelters, and the new rules bar any claims of government approval of any specific kind of shelter. However, if the shelter meets minimum OCD requirements, the manufacturer can say so. Also outlawed are scare advertising, fraudulent guarantees, false claims on prices, and other tricks. -- Air. Eng.

03121034

INDUSTRIAL MEDICAL PRACTICE

- 508 Modern Concepts of Diagnosis and Treatment in Occupational Medicine. M. R. Zavan.
Am. Ind. Hyg. Assn. J. 23, 30-36 (Jan.-Feb. 1962).

Diagnosis and treatment in occupational medicine have changed remarkably in recent years yet the fundamentals of diagnosis and treatment have not really changed at all. As all of medicine advances, it carries occupational medicine with it, yet this specialty has a unique opportunity to contribute in the manner in which it solves its special problems, problems which may affect such a large proportion of the gainfully employed adult population. We are becoming more concerned with function and comparatively less concerned with anatomical change. We are becoming more specific in our diagnostic techniques while simultaneously depending more on epidemiologic methods to indicate the presence or absence of effect. Diagnosis and treatment in this specialty have advanced remarkably but unless we can train practitioners to think in logical terms, future advances will be by fits and starts rather than on a broad general front.

-- Author's conclusions

- 509 Hazards to Health—Criteria for Diagnosis of Occupational Disease. H. L. Hardy.
New Engl. J. Med. 264, 1046 (1961).

The diagnosis of occupationally related disease is difficult except when there is an epidemic occurrence in a small group of workers, such as lead poisoning in storage battery manufacture. Most frequently, however, the physician is faced with diagnosing work-related disease in a single individual. A delay of 15 years or more from exposure to demonstrable disease is not uncommon, as in silicosis, beryllium disease, and cancer of the lung complicating asbestosis. On the other hand, some symptoms or physical findings immediately bring to mind the probability of occupational disease; for example, nasal septal perforation in chrome workers, asbestos bodies in the sputum of exposed workers, and the anthrax pustule. The body's reactions to bacteria, toxic chemicals, and harmful dusts are nonspecific; thus, there are no definite syndromes upon which to base a diagnosis of occupational disease; for example, the cataracts caused by ionizing radiation and the hepatitis caused by inhalation of carbon tetrachloride cannot be differentiated from these same changes resulting from other causes. The physician, to approach this complicated problem intelligently, must know the quality and quantity of the material to which the individual has been exposed and the method of exposure. The quality is necessary because compounds very much alike chemically react differently; thus benzene causes hematopoietic depression while toluene is harmless until high levels are reached, when it acts as a narcotic. Environmental factors may affect the quantity absorbed; a high temperature or heavy labor may result in a large dose so that 2 workers in the same room may not absorb the same dosage. The physician can obtain help from technically trained persons, from insurance companies, state agencies, and some educational institutions.

-- J. Occ. Med. Absts.

- 510 The Army's Health Service Program. E. J. Dehne. J. Occ. Med. 4, 190-191 (Apr. 1962).

Special investigative studies have been carried out during the development of chemicals as missile propellant fuels and oxidizers to insure that timely personal protective measures, engineering controls, medical surveillance of workers and health education and supervision can be provided to Army missile-men. In the field and at missile sites, sanitary engineering surveys are carried out in relation to water supplies, sewage disposal, food sanitation, housing, and stream and atmospheric pollution. The environmental health problems created by missile operations have ranged from control of exposure to exotic fuels at missile test pads to insect control at isolated air defense sites. Solutions to these problems have been based upon traditional methods as well as upon novel and unique concepts of health preservation through development of new instruments and protective equipment. And, as with any Army operations, the success of Army missiles as weapons and as space research vehicles has been dependent upon the protection of the health of those who create and work with them.

-- Author's conclusion

03121035

- 511 Industrial Hygiene at Boeing Aerospace Division. W. C. Applegate and W. H. Poppe, Jr.
Ind. Med. & Surg. 31, 6-11 (Jan. 1962).

The industrial hygiene program established in 1954, comprises several broad fields. One is the collection of information, partly by questionnaire to vendors of proprietary products used in the plant, and its dissemination to selected personnel. More than half of the staff is engaged in industrial hygiene activities connected with the specific programs of production, testing, research, and development. Radiation protection and industrial sanitation are also included. With the advent of the missiles programs, the industrial hygiene interests and responsibilities have been greatly expanded to take in areas and sites far beyond the plant confines.

-- Public Health Eng. Absts.

- 512 Changing Objectives in Occupational Health. T. Hatch.
Am. Ind. Hyg. Assn. J. 23, 1-7 (Jan.-Feb. 1962).

The objectives and emphasis of industrial hygiene have shifted over the years from the early efforts to prevent frank cases of specific diseases to the modern concepts of securing and maintaining the mental and physical health, well being, and productive efficiency of workers. This has increased the dimensions and subtleties of the man-environment relationship and the need for understanding the etiology of occupational disease. These require more refined methods of measurement on both man and environment. New definitions and criteria of health and impairment must be developed.

-- Author's abstr.

- 513 Evaluation and Improvement of Seats. J. J. Keegan.
Ind. Med. & Surg. 31, 137-148 (Apr. 1962).

Improvement in the design of seats has long been handicapped by traditional forms, anthropometric measurements, and designing engineers' or stylists' ideas, with insufficient knowledge of physiological and medical factors in seating. Recent medical knowledge of the cause of most postural low back discomfort and pain in degenerated lower lumbar intervertebral discs has permitted better analysis of the seating problem. There are three prevalent misconceptions concerning seating: that the proper sitting position is at a right angle between trunk and thighs, that the chief back support should be at the shoulders, neglecting the lumbar region, and that the seat should support the thighs. This has led to seats with high, vertically straight, near right angled backs that flatten the lumbar curve, and to excessively long seats which interfere with positioning of the legs, particularly for the average short person. The correct seat, designed for comfort and protection, should have an angle of at least 105 degrees between shoulders and thighs, soft rounded support in the lower lumbar region, and seat length and height not over 16 inches. This prevents flattening of the lumbar curve and permits needed change of position in the seat. Lesser factors in a correct seat are open space beneath the front, tilt of about 5 degrees, moderate cushioning or molding of front border, porous cover cloth, and arm rests open beneath the elbows. Advice to the public in selecting seats, at present available without lower lumbar support, is to note particularly the angle of the back which should permit some relaxing backward shoulder position, and the length of the seat which should permit freedom back of the knees and contact over the lumbar region. Height of near 16 inches and open space for the sacrum and feet are important. No seat has needed vertically curved lumbar support. Impervious cover and hard arm rests extending beneath the elbows are to be avoided.

-- Cond. from author's summary

- 514 The Role of the Internist in the Handling of Multiple Injuries. W. J. Zinn.
J. Occ. Med. 4, 242-244 (May 1962).

The internist can assist in multiple injury care through two main channels: (1) he can assist in controlling special physiologic modalities (hypothermia; dialysis); (2) he can assume responsibility for correction of associated medical emergencies and prevention thereof, i.e., cardiac, endocrine, renal, or hepatic illness. The bulk of this discussion has stressed the use of hypothermia because of its ease and safety in application and its prompt over-all protection of the total body economy in a time of acute need.

-- Author's summary

03121036

- 515 Fractures of the Hand. I. Description; II. Statistical Review. W. D. Butt.
Can. Med. Assn. J. 86, 731-735 (Apr. 21, 1962); *ibid.* 86, 775-779 (Apr. 28, 1962).

Fractures of the hand were found to account for 30% of the cases settled by the Workmen's Compensation Board of Ontario for the years 1955, 1956, and 1957. This figure is in agreement with other series. Fractures of the hand, as a group, represent the most frequent fracture of the body, and have received the least study. Heavy manufacturing produces most of these fractures. Most of the fractures are closed; and when accurate diagnosis could be made, comminuted. The accidents occur in the younger working age group and seldom in females. Treatment was simple immobilization in over half the cases. Active motion was allowed in many cases of fracture, with apparent good results. Reconstructive procedures were found to have increased in frequency. Over 90% of the fractures had normal resolution, and the patient returned to work. However, the pension awards have increased in number in the group of small awards to those with less than 1% disability. Complications related to fractures of the hand occurred in only 14% of cases. Infection occurred even with the use of antibiotics.

-- Author's summary

- 516 The Electromyogram in the Differential Diagnosis of Shoulder Cuff Syndrome.
A. A. Marinacci and J. H. Lindheimer. Ind. Med. & Surg. 31, 152-156 (Apr. 1962).

In examining electromyographically a large number of cases representing the shoulder cuff syndrome, a syndrome characterized by atrophy of the supraspinatus, infraspinatus, subscapularis, and the teres minor muscles, it was observed that correct etiological diagnosis often was difficult. Only a small percentage of these cases actually proved to be examples of true shoulder cuff syndrome. It appears that the clinician is apt to label the condition a shoulder cuff syndrome whenever there is atrophy of the regional muscles, regardless of etiological factors. With the aid of the electromyogram, it has been shown that there are many lesions other than true shoulder cuff syndrome that can give rise to atrophy of the involved muscle group. These simulators can arise from a lesion of the cervical cord, fifth cervical nerve root compression, an injury of the upper trunk of the brachial plexus, isolated lesions of the suprascapular nerve, lesions of the forearm that can produce secondary muscular atrophy of the shoulder girdle, horse serum pleuritis, and atrophy of disuse producing immobilization of the shoulder girdle as from bursitis, hysterical paralysis, and even muscular dystrophy. The electromyogram has been found to be of value in differentiating genuine shoulder cuff syndrome, in which the electromyographic findings are normal, from the numerous lesions of neighboring nervous structures which imitate this symptom-complex, but which show electromyographic changes characteristic of the individual lesions.

-- Authors' summary

- 517 Cor Pulmonale: A Disease of the Whole Heart. M. D. Altschule.
Diseases of Chest 41, 398-403 (Apr. 1962).

Although the term "chronic cor pulmonale" is widely used in clinical cardiology, its meaning varies greatly from clinician to clinician. The idea that chronic cor pulmonale is a disease in which the strain is solely on the right ventricle is, however, widespread. Nevertheless, this view has no basis in observation: abnormal physiologic factors present in chronic cor pulmonale are known to increase the work of both ventricles. Thus hypoxia and acidosis by increasing blood flow increase the work of both ventricles equally. However, hypoxia causes pulmonary vasoconstriction, which increases the work of the right ventricle alone. On the other hand, the development of shunts from bronchiolar arteries to pulmonary veins such as occurs particularly in fibrosing pulmonary diseases increases the work of the left ventricle alone. The manifestations of chronic cor pulmonale are the summation and results of several diverse factors.

-- Author's summary

- 518 Cigarette Smoking and Coronary Heart Disease. Combined Experience of the Albany and Framingham Studies. J. T. Doyle, et al. New Engl. J. Med. 266, 796-801 (Apr. 19, 1962).

The smoking habit of 4,120 men is related to morbidity and mortality from coronary heart disease. This group consists of 1,838 men originally 39 to 55 years old residing in Albany, New York, and 2,282 men originally 30 to 62 years old residing in Framingham, Massachusetts,

observed for 6 years and for 8 years respectively. Both groups were free of coronary heart disease at their first examination. Heavy cigarette smokers experience a three-fold increase in the incidence of myocardial infarction and in death from all causes as compared to non-smokers, pipe and cigar smokers and former cigarette smokers. Cigarette smoking is apparently unrelated to the incidence of angina pectoris. Former smokers and cigar and pipe smokers have morbidity and mortality experiences similar to those who have never smoked. The mechanism whereby heavy cigarette smoking increases the death rate not only from coronary heart disease but from all causes is obscure. There are 28 references to the subject in the bibliography.

-- Authors' summary

- 519 The Exercise Test and Prognosis of Coronary Heart Disease. G. E. Dimond.
Circulation 24, 736 (Oct. 1961).

One hundred fifty-three railway operating employees with known or suspected coronary artery disease were examined with an exercise test whose demands appear to have been in excess of the "double Masters test." During the 5-year follow-up period 16 (43%) of the 37 with a positive test result experienced a myocardial infarction, whereas only 16 (14%) of the 116 with a negative test result suffered the same fate. The author explains the fairly high incidence of false-negative results on the development of collateral coronary circulation. While a positive test has prognostic implication of statistical significance in a large group, the number of false-negative tests limits its applicability in individual problems. Final decisions regarding proper job placement were not based exclusively on the results of the exercise test. Individuals with positive test results continued at work as long as their symptoms were not incapacitating. Job restrictions were applied where sudden death or disability would constitute a hazard to others.

-- J. Occ. Med. Absts.

- 520 Hypoglycemia and Diabetes. F. W. Whitehouse. Ind. Med. & Surg. 31, 149-151 (Apr. 1962).

All diabetics should not be stigmatized by the problems of one. Employers should assume an enlightened attitude toward the patient with diabetes and not make him fearful of revelation. In this atmosphere, the diabetic will be encouraged to identify himself to his industrial physician. All employees with diabetes should be known to the industrial physician. The individual must be classified to permit maximum safety for himself and his co-workers. The diabetic who is understanding and intelligent will be a cooperative and willing worker. The diabetic must also recognize a responsibility to himself, his employer, and to other diabetics. One bad experience with a diabetic may prejudice non-medical people toward all diabetics. This philosophy is part of the education of the diabetic. A spirit of cooperation on the part of the patient, his family physician, his industrial physician, and his employer will result in a healthy patient and a reliable worker.

- 521 Uterine Cancer Detection by the Tampon Method. Brita McLean, F. G. Talbot and W. Jend, Jr.
Ind. Med. & Surg. 31, 1-5 (Jan. 1962).

Uterine cancer screening by the tampon method in an industrial group of 6,083 women over a 40-month period is reported. The test has been acceptable, practical, and effective. Thirteen cases of previously undetected uterine malignancy were found. In addition, there were 42 cases with pelvic pathology that needed medical intervention. However, because of the large number of unsatisfactory smears that had to be repeated and because the cytologists find it more difficult to interpret the tampon smears, the authors will not continue with this screening technique. Instead, the employees are encouraged to have a pelvic examination including a direct smear as part of an annual health evaluation.

-- Authors' summary

- 522 Industry and Carcinogenesis of the Lung. H. J. Brock.
Diseases of Chest 41, 442-445 (Apr. 1962).

There is excellent evidence, both clinical and experimental, that bronchogenic carcinoma may be induced by the inhalation of certain mineral dusts. The number of cases of bronchogenic carcinoma induced by the inhalation of inorganic metals in certain hazardous

occupations is relatively small and in no way accounts for the recent rapid rise in the incidence of this type of neoplasm. Experimental evidence reveals the ability of certain organic substances such as coal tar, aromatic and aliphatic hydrocarbons and ozonized gasoline to induce carcinogenesis in experimental animals. The greater incidence of bronchogenic carcinoma in urban than in rural communities suggests the possibility that industrial atmospheric pollution by organic and inorganic chemical substances may play an important part in the increasing incidence of bronchogenic carcinoma throughout the world.

-- Author's conclusions

SKIN DISEASES AND BURNS

- 523 Occupational Dermatitis of Railroad Workers. I. Kaplan and I. Zeligman.
Arch. Dermatol. 85, 135 (1962).

Ninety-eight cases of major occupational skin diseases occurred in the Baltimore and Ohio Railroad system in a recent 5-year period. These cases lasted at least 30 days and required the consultative services of a dermatologist. Important causes of occupational dermatitis were diesel fuel oil, soaps and detergents, sodium chromate, diesel lubricating or crank case oil, grease, and kerosene and other solvents. The commonest cause of occupational dermatitis was diesel fuel oil, which is usually regarded as a defatting agent and skin irritant. When allergic sensitization is suspected, a 25% concentration in olive oil is recommended for patch testing. For patch testing in chromate dermatitis, a 0.25% aqueous solution of potassium dichromate was used. Preventive measures included education, protective clothing, barrier creams, and changes in handling techniques of irritating and sensitizing materials.

-- J. Occ. Med. Absts.

- 524 Investigation of an Outbreak of Photodermatitis Confined to one Shop in a Large Factory.
D. W. W. Jones. Brit. J. Ind. Med. 19, 100-104 (Apr. 1962).

Out of 106 men employed in a foundry attached to a large factory, 29 men developed a photosensitization dermatitis over a period of 3 months. Three men out of 1,700 employed in the remainder of the works developed a similar eruption, but no common factor was apparent. Owing to the very high incidence in the foundry, a sensitizer associated with the process was suspected and it seemed likely that it would prove to be an atmospheric contaminant. Many chemical investigations and skin tests were carried out without positive result, though much interesting information regarding combustion products of various materials was obtained. Some of the men were referred to dermatological clinics in 3 neighboring hospitals. In one of these clinics, a similarity was noticed between 6 cases recently seen there. This suggested that the sensitizer was not confined to the foundry or to the factory. The cause was eventually traced to an additive (tetrachlorosalicylanilide) in a popular brand of toilet soap, and it was evident that the photosensitivity in varying degrees of severity was widespread over the Home Counties, if not much of the country. It had not hitherto been recognized, as mild cases had required little or no treatment, and severe cases were widely disseminated. It is probable that, had it not been for the very high incidence in the foundry, the eruption would have remained unrecognized for much longer. The high incidence in the foundry is attributed to the frequency with which the men washed there, and possibly to some local aggravating factor not yet discovered.

-- Author's abst.

- 525 Carcinoma of the Skin in Machine Tool Setters. J. G. Fife.
Brit. J. Ind. Med. 19, 123-125 (Apr. 1962).

Two cases of extensive squamous carcinoma of the scrotum are described in men who were working together as capstan lathe setters in the same workshop. The incidence of cancer of the skin is discussed with special reference to workers outside the cotton industry, and the importance of periodic medical examination of persons in contact with mineral oil is emphasized.

-- Author's abst.

03121039

- 526 Experimental Berylliosis. I. Effects of a Single Intradermal Injection of Beryllium Nitrate into Guinea Pigs. B. M. Levy and G. M. Higgins. *J. Invest. Dermatol.* 37, 175 (1961).

Intradermal injection of 0.05 cc. of a 1% beryllium nitrate solution into guinea pigs produced an acute inflammatory reaction in 2 days. This acute inflammatory reaction extended from epidermis to deep muscle and was followed by fibrosis. Four weeks after injection, a granuloma extended from epidermis to muscle tissue. Skin appendages were destroyed. The granulomatous reactions were still present 6 months after the injection. This morphological reaction is similar to that resulting from intradermal injection of zirconium into human volunteers. Basically it is a foreign body reaction.

-- J. Occ. Med. Absts.

CHEMICAL HAZARDS

- 527 Metal Carcinogenesis. I. Observations on the Carcinogenicity of a Refinery Dust, Cobalt Oxide, and Colloidal Thorium Dioxide. J. P. W. Gilman and G. M. Ruckerbauer. *Cancer Research* 22, 152-157 (Feb. 1962).

A metallurgical dust obtained from the dust flue of a nickel refinery was shown to be a locally acting carcinogen in both rats and mice. Sarcomas were induced in two strains of rats at about 45% of the sites of intramuscular injection, with most of the tumors being demonstrably of striated muscle cell origin. Average latent periods approximated 6 months, and metastases occurred frequently. Mice proved less responsive than rats, showing significantly longer latent periods and an absence of metastases. A majority of the mouse tumors appeared to be fibrosarcomas. Similar experiments utilizing single intramuscular injections of cobalt oxide powder gave a 50% local incidence of rhabdomyosarcomas in rats but proved completely negative in the mice tested. Single intramuscular injections of Thorotrast failed to induce a local tumor response in either rats or mice. Four out of 50 Thorotrast treated mice developed malignant lymphomas in an average of 457 days. No sarcomas or malignant lymphomas were observed in control animals given injections of Procaine Penicillin G.

-- Nuclear Sci. Absts.

- 528 Metal Carcinogenesis. II. A Study on the Carcinogenic Activity of Cobalt, Copper, Iron, and Nickel Compounds. J. P. W. Gilman. *Cancer Research* 22, 158-162 (Feb. 1962).

Nickel sulfide, nickel oxide, cobalt sulfide, and cobalt oxide were shown to be carcinogenic on single intramuscular injection in rats. The sulfide of each metal induced a significantly higher tumor incidence than did its oxide. Comparisons between average latent periods and between measures of tumor progression also indicated that the presence of sulfide enhances the carcinogenic activity of these compounds. Nickel sulfate, iron and copper sulfides, and oxides failed to induce tumors in rats under these conditions. Both C3H and Swiss mice developed tumors from single intramuscular exposure to Ni_3S_2 and to NiO ; however, no tumors were induced with CoO in these species. Tumor response in mice was consistently lower than in rats, and no apparent enhancing effect of the sulfide was evidenced. In rats, almost all tumors examined histologically were rhabdomyosarcomas, with a few fibrosarcomas, particularly among those tumors induced with NiO . Difficulty was encountered in definitely classifying the mouse tumors; whereas most appeared to be fibrosarcomas, many of these were not typical, and a few were almost certainly myomas. It was concluded that nickel sulfide was probably the compound responsible for the carcinogenic activity of the sample of metallurgical dust originally investigated (collected from the dust flue of a nickel refinery). The apparent specificity of nickel and cobalt compounds for striated muscle tumorigenesis is discussed.

-- Nuclear Sci. Absts.

03121040

- 529 New Concepts and Future Trends in Toxicology. H. E. Stokinger.
Am. Ind. Hyg. Assn. J. 23, 8-19 (Jan.-Feb. 1962).

New concepts and procedures derived from related fields of biochemistry, pharmacology, immunochemistry, and genetics, are now at the disposal of the industrial toxicologist to aid in the solution of problems in 2 broad areas of investigation: (1) early indicators of response to toxic agents, and (2) mechanisms of toxic stress. Shown here are many ways of using body metabolites, tissue enzymes, alone and in combination, and tissue metals for the detection of early responses to toxic agents while the responses are still reversible. Immunochemical changes not heretofore recognized are now shown to be often a response to inhaled chemicals. Highlighted are mechanisms of action of carbon tetrachloride, oxidant gases, radio-mimetic chemicals, organic phosphate insecticides and other substances of industrial interest.

-- Author's abst.

- 530 Unexpected Hazards Associated with Drugs and Chemicals. E. A. Sellers.
Can. Med. Assn. J. 86, 721-724 (Apr. 21, 1962).

Accidental poisoning, in its broad sense, may be categorized as specifically accidental, iatrogenic or environmental. In most cases of poisoning, emergency treatment and diagnosis (or identification) present no serious problem and suggest appropriate definitive treatment. If toxicity is due to a combination of chemical substances, an unexpected reaction of the body (genetically controlled, or altered by hormone therapy) or an unexpected drug reaction, the "informed guess" of the physician is of crucial importance in diagnosis. The concept of "maximum allowable concentrations" (MAC) in relation to industrial and agricultural chemicals and food additives is discussed. It is suggested that increasing exposure to new chemicals is inherent in growth of population and industrialization. Appreciation that hazards exist is the first and most important step in control.

-- Author's summary

- 531 A Toxicologist's View of Threshold Limits. H. F. Smyth, Jr.
Am. Ind. Hyg. Assn. J. 23, 37-44 (Jan.-Feb. 1962).

Experience in this country with threshold limits based upon toxicological experiment with animals has been good. Despite the fact that the limits are used only as guides, and are not sharp lines separating safe from injurious atmospheres, more consideration should be given to the conditions the numbers are meant to represent. In particular the time-weighted average concentration is physiologically wrong for about half of the limits, and can result in injurious exposures. If the threshold limits referred to a maximum concentration existing at any time during the working day, the substances for which this is physiologically wrong, would be controlled by a conservative standard. Tables of threshold limits would be more useful if they indicated the injury which could result from a small excess, in order to guide the management of exposures where full conformance is impossible. The philosophy of the Russian maximum allowable concentrations seems to be that workmen should not be exposed to any concentration which produces a detectable physiological response, with no consideration as to whether such a response is harmful. An exploratory study of the conditioned reflex behavioral technique indicates that the method may detect effects which other toxicological methods do not suggest.

-- Author's summary

- 532 Threshold Limits and Maximal Acceptable Concentrations: Their Definition and Interpretation, 1961. H. E. Stokinger. Am. Ind. Hyg. Assn. J. 23, 45-47 (Jan.-Feb. 1962).

A statement of the principles that guide the Committee in recommendation of Threshold Limit Values is presented. The definition and concept of threshold limit values are contrasted to those of the maximal acceptable concentrations. The notation of absorption through the skin and the documentation of justifications of limits are discussed.

-- Author's abst.

03121041

- 533 Effect of Molybdenum on Fluoride Absorption. G. K. Stookey, D. B. Crane and J. C. Muhler. Proc. Soc. Exptl. Biol. Med. 109, 580-583 (Mar. 1962).

Studies were conducted to investigate the mechanism by which molybdenum increases the skeletal retention of fluoride. The absorption of fluoride in presence and absence of molybdenum was studied in albino rats ranging in age from weanling to adults, employing isolated gastrointestinal tract segments and the entire tract in the intact animals. These data indicate that age plays a prominent role in absorption of fluoride as affected by molybdenum. In general, the presence of molybdenum significantly increases the absorption of fluoride from the first portion of the intestine of older animals and acts inversely in young animals. The reverse is seen in the stomach where molybdenum appears to decrease absorption of fluoride in older animals, and either increases it slightly or has no effect in younger animals. These data suggest that in older animals the presence of molybdenum may increase absorption of fluoride.

-- Authors' summary

- 534 Synergistic Effect of Molybdenum and Fluoride on Dental Caries in Rat. G. K. Stookey, Robin A. Roberts and J. C. Muhler. Proc. Soc. Exptl. Biol. Med. 109, 702-705 (Mar. 1962).

A study was conducted to determine the effect of molybdenum and fluoride upon dental caries in the albino rat. Addition of 25 ppm molybdenum to the drinking water decreased the incidence of dental caries by 18% while addition of 25 ppm fluoride decreased the caries incidence by 32%. Addition of both 25 ppm molybdenum and 25 ppm fluoride resulted in a greater effect, with the caries incidence reduced by 52%. Fluoride analysis performed upon the femurs, incisors, and whole carcasses confirmed earlier reports that the presence of molybdenum is associated with an increased skeletal retention of fluoride. The analysis of the carcasses for molybdenum indicated comparable concentrations of molybdenum in the presence and absence of fluoride suggesting that the increased anticariogenic effectiveness and skeletal retention of fluoride in the presence of molybdenum may be due to the ability of molybdenum to increase the metabolic availability of the fluoride ion.

-- Authors' summary

- 535 Phosphorus Necrosis of the Jaw: A Present-Day Study. With Clinical and Biochemical Studies. J. P. W. Hughes, et al. Brit. J. Ind. Med. 19, 83-99 (Apr. 1962).

A historical note on the etiology of phossy jaw shows that present-day knowledge is little greater than it was a century ago. The varied clinical course of the disease is described together with a report of 10 classical cases not previously reported. Six cases, not amounting to true necrosis but in which healing after dental extraction was delayed, are described, and mention is made of the noticeable differences in the oral state and appearances of tartar of healthy workmen exposed to phosphorus compared with healthy workmen not exposed. But no systematic differences of any kind were found in the incidence of general infections, fractures of the bones, hematological findings, and biochemical studies of blood and urine in 2 groups of healthy men most exposed and least exposed to phosphorus in the same factory. An intensive study in the hospital of a case of classical necrosis showed no departure from normal, except delayed healing following bone biopsy from the iliac crest, and a reversed polymorphonuclear/lymphocyte ratio. In the discussion, the time of onset of necrosis after first exposure to phosphorus, clinical and radiological diagnosis, the organisms present, personal susceptibility, the appearance of the sequestra, and regeneration of bone are considered. An up-to-date note on prevention of the disease is given, although this has met with only partial success. Some persons are highly susceptible and, while complete protection is impossible in the light of our present knowledge, early diagnosis and modern treatment have robbed the disease of its terrible manifestations of victorian times and turned it into a minor, although often uncomfortable complaint, with little or no resulting disability.

-- Authors' abst.

03121042

- 536 Bronchotetany Presenting as Bronchial Asthma in Case of Chronic Fluorine Poisoning.
L. Spira. *Ann. Allergy* 20, 115 (Feb. 1962).

Fluorine is a nerve poison whose action consists in precipitating calcium in the body by way of the parathyroids. This leads to the development of tetany. When affecting the vegetative nerve supply to bronchioli, fluorine produces bronchotetany manifested by asthma. A victim of fluorosis resulting from the protracted ingestion of normal food contaminated by fluorine developed asthmatic attacks. They were stopped by treatment directed against fluorosis; relaxation of the therapy led to recrudescence of the tetanic condition, including bronchitis and dyspnea, of nocturnal cramps in the calves, and of paresthesia in the hands. Not the concentration of the poison contained in any one article of food or drink but the sum total of fluorine daily ingested causes bronchotetany. Bronchial asthma caused by long-continued ingestion of toxic amounts of fluorine belongs to the sphere of preventive medicine.

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

- 537 Calcium Disodium Edathamil in the Treatment of Ferrous Sulfate Poisoning. H. Barrie and B. D. R. Wilson. *J. Am. Med. Assn.* 180, 244-246 (Apr. 21, 1962).

Calcium disodium edathamil (EDTA), a chelating agent, is a valuable adjunct in the management of acute iron poisoning. The following routine for children with acute iron poisoning is recommended: (1) promote emesis to eliminate solid particles of the poison which will not be withdrawn by tube; (2) gastric lavage with 1% sodium bicarbonate solution (1 1/2 teaspoons per pint); (3) combat shock with oxygen, warmth, intravenous isotonic glucose, dextran or blood, and norepinephrine (noradrenaline); (4) dissolve 500 mg. of calcium disodium edathamil in 250-500 ml. of isotonic glucose and infuse slowly over 12 hours—repeat if necessary; (5) correct any acidosis with molar lactate solution; (6) give small quantities of milk or 1% sodium bicarbonate solution by mouth or down tube, with 500 mg. of calcium disodium edathamil; and (7) give a suitable prophylactic antibiotic. On admission, blood should be drawn for estimation of hemoglobin, serum iron, serum bicarbonate and pH, and for blood grouping, and repeat estimations carried out as indicated.

-- Authors' summary

- 538 Acute Arsenic Intoxication Diagnosed by Roentgenograms: Report of a Case with Survival.
R. J. Hilfer and A. Mandel. *New Engl. J. Med.* 266, 663 (Mar. 29, 1962).

Arsenic trioxide appeared as a barium-like radiopaque material on a roentgenogram of the abdomen. A case is reported in which a flat film of the abdomen led to the correct diagnosis of arsenic poisoning in a case of acute gastroenteritis. The authors emphasize that valuable time may be saved and treatment instituted even before chemical confirmation.

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

- 539 The Anemia of Lead Poisoning. H. E. Hutchison and J. M. Stark.
J. Clin. Pathol. 14, 548-549 (Sept. 1961). (*Journal of Clinical Pathology*, British Medical Association, Tavistock Square, London WC 1, England*).

The anemia of lead poisoning is usually thought to be normochromic and normocytic, and punctate basophilia is regarded as a constant feature of the well-developed case. The anemia was formerly attributed to shortened survival of cells in the circulation, but more recently the importance of interference with the synthesis of hemoglobin has been recognized. The authors report 3 cases (2 resulting from work and one from over-indulgence in lead and opium pills for diarrhea) in which raised reticulocyte counts (with increased excretion of urobilinogen in 2) suggested increased destruction of red cells, but there was also peripheral hypochromia in all 3 despite adequate stores of iron in the marrow. This indicated selective depression of the synthesis of hemoglobin. In 3 other cases of proved lead poisoning there was little or no anemia.

-- Bull. Hyg.

* Address not in current List of Periodicals.

- 540 Metabolism and Excretion of Trichloroethylene after Inhalation by Human Subjects.
V. Bartonicek. *Brit. J. Ind. Med.* 19, 134-141 (Apr. 1962).

Eight volunteers were exposed to trichloroethylene vapor (1,042 micrograms/liter) for 5 hours; 51 to 64% of the inhaled trichloroethylene was retained. The concentration of trichloroethanol and trichloroacetic acid in the urine was studied daily for a 3-week period; on the 3rd day both metabolites were determined in feces, sweat, and saliva. The concentration of trichloroacetic acid in plasma and red blood cells was studied on alternate days. Of the trichloroethylene retained, 38.0 to 49.7% was excreted in the urine as trichloroethanol and 27.4 to 35.7% as trichloroacetic acid. Of both metabolites 8.4% was excreted in the feces. Sweat collected on the 3rd day of the experiment contained 0.10 to 1.92 mg./100 ml. trichloroethanol and 0.15 to 0.35 mg./100 ml. trichloroacetic acid. In saliva the concentrations were 0.09 to 0.32 mg./100 ml. trichloroethanol and 0.10 to 0.15 mg./100 ml. trichloroacetic acid. The value of the expression trichloroethanol/trichloroacetic acid calculated in the urine within 22 days was within the range 1.15 to 1.81.

-- Author's abst.

- 541 Investigations on the Toxicity of Butyloxytoluene. A. Sporn and O. Schobesch.
Igiene (Bucharest) 10, 113-119 (Apr.-June 1961).

The authors have investigated the chronic toxicity of butyloxytoluene in rats. In 16 animals given a diet containing 19.9% of casein and 0.2% of the compound over a period of 8 weeks a gain in weight from an initial value of 57 g. to 163 g. was noted compared with 147.8 g. in a control group of rats of the same initial weight which received diet alone. The average weekly amount of food taken was 57.3 g. in the treated and 54.9 g. in the control group. Growth 47% and 41% in excess of the controls was observed in 2 similar experiments carried out on 4 groups of 16 rats which received diets containing 16.6% and 9.6% of casein and the same amount of compound. Lower protein nitrogen values and an increase in lipid content were found in the livers of the treated animals, and also an increase in the weight of the adrenals and in their ascorbic acid content.

-- Bull. Hyg.

- 542 Blood Cholinesterase Inhibition after Dermal Absorption of Two Organophosphorus Agents.
M. W. Williams, R. D. Baker and R. W. Covill.
Toxicol. & Appl. Pharmacol. 4, 271-275 (May 1962).

The rate of whole-blood cholinesterase inhibition as a result of the dermal absorption of Trithion and Methyl Trithion has been studied over a 6-hour post-treatment period in the anesthetized rat. The linear regressions of mean values of delta pH plotted against time indicate that the rate of drop in cholinesterase activity is virtually identical for the two agents, despite wide differences in acute oral toxicities (6.7 times).

-- Authors' summary

- 543 Toxicologic Studies on Sodium Lauryl Glyceryl Ether Sulfonate and Sodium Lauryl Trioxethylene Sulfate. T. W. Tusing, O. E. Paynter, D. L. Opdyke and F. H. Snyder.
Toxicol. & Appl. Pharmacol. 4, 402-409 (May 1962).

The acute and chronic toxicity of sodium lauryl glyceryl ether sulfonate and sodium lauryl trioxethylene sulfate have been studied in rats, and skin tumorigenicity has been investigated in mice. LD50 values determined by oral administration to rats were 1.82 g./kg. for both compounds. Rats received the surface-active agents at levels of 0.1% and 0.5% in the diet for 2 years, with some animals sacrificed for examination at the end of one year. No adverse effects were observed in the experimental animals with respect to survival, growth, reproduction, food consumption, hematologic values, blood chemistry, or urine analyses. Microscopic evaluation of tissues revealed no pathogenic changes resulting from ingestion of the test materials. Scattered differences were found in organ: body weight ratios. No effects of the surfactants were observed in the first or second generation offspring of the original animals. Twice-weekly application, for 105 weeks, of 5% aqueous solutions of sodium lauryl glyceryl ether sulfonate and sodium lauryl trioxethylene sulfate to the skin of Swiss female mice did not lead to the development of skin tumors in any of the animals. Based on the results of these investigations, there is no evidence that exposure to these 2 surfactants poses a toxic hazard to humans.

-- Authors' summary

- 544 A Procedure for Estimating the Hepatotoxic Potential of Certain Industrial Solvents. S. D. Kutob and G. L. Plaa. *Toxicol. & Appl. Pharmacol.* 4, 354-361 (May 1962).

A screening procedure has been described for estimating the hepatotoxic potential of industrial solvents in mice. The solvents investigated were: CH_3I , CH_2Cl_2 , CH_2Br_2 , CH_2I_2 , CHCl_3 , CHBr_3 , CHI_3 , CCl_4 , and CBr_4 . Data on lethality, barbiturate sleeping time, and bromosulfalein retention, coupled with minimal histologic examination, were employed to determine the individual hepatotoxic potency and relative hepatotoxic potencies for the 9 halogenated methane derivatives listed above. A method has been described for estimating the industrial hepatotoxic hazard by these data.

INDUSTRIAL DUSTS

- 545 Improved Membrane Filter Air Sampling Methods for Environmental Control. K. J. Schiager, et al. *Health Physics (London)* 7, 185-190 (Feb. 1961).

Air sampling can be an effective tool for environmental control, especially when applied directly at the potential source of contamination. The equipment and techniques described were designed to facilitate the collection of localized samples directly at the source of potential contamination. Routine use of membrane filters was simplified by the design of a small, inexpensive filter holder, providing advantages over commercially available units, e.g., reduced size and weight, tight sealing against any filter material without the twist lock action which often damages filter membranes, and parts exposed to contamination are expendable. Techniques for determining sample collection rates directly from vacuum gauge readings and sample preparation for use with internal proportional counters are discussed. A combination alpha-gamma scintillation detector assembly, designed specifically for counting membrane filter samples was constructed.

-- APCA Absts.

- 546 Glass Fibers and Their Use as Filter Media. A. Marzocchi, F. Lachut and W. H. Willis, Jr. *J. Air-Poll. Control Assn.* 12, 38-42 (Jan. 1962).

The use of textile glass fibers and their application in dust and fume filtration devices for air pollution abatement and product collection are discussed. In the selection of a dust collection system for a particular application, all of the filter media properties must be assessed and related to the particular application. Industry is turning increasingly to filter systems which can handle gases at elevated temperatures (300-500°F) in order to operate above the dew-point and reduce the expense of cooling the gases. Physical and chemical properties of glass fibers, installations using fiber glass filter media, carbon black, cement, steel, and other industries are discussed in detail.

-- APCA Absts.

- 547 Byssinosis in the Cotton Industry of Egypt. M. A. El Batawi. *Brit. J. Ind. Med.* 19, 126-130 (Apr. 1962).

An epidemiological investigation in 11 ginneries representing the ginning industry in Egypt demonstrated the existence of byssinosis among 38.4% of the workers. Studies of 2 pressing plants and 2 card rooms in Alexandria showed a prevalence of byssinosis of 52.6% and 26.6% respectively. The ages of those exposed and the duration of exposure were considered in relation to the prevalence of byssinosis, and it appears that a short duration of exposure in ginning may result in early manifestations of byssinosis at a relatively young age. The interruption of exposure due to seasonal activity in ginning and partially in pressing resulted in a higher proportion of workers with the early stages of the disease. This contrasted with results the carding where exposure is continuous, and a higher proportion of workers have later stages of the disease. This suggests a delay in the progress of the disease due to periodic interruption of exposure. The comparison between the prevalence of byssinosis and that of chronic bronchitis has shown that these diseases are not necessarily associated, although additional stress due to dust exposure in chronic bronchitis is not denied.

-- Author's abst.

03121045

- 548 Pneumoconiosis in Cleaners of Steel Castings. J. F. C. Du Toit, A. M. Adelstein and E. L. Moller. *Med. Proc. (Johannesburg)* 7, 462-466 (Nov. 4, 1961).

Pneumoconiosis is well known as a serious risk among steel foundry fettlers and the presumptive reasons why this should be so are indicated. A description is given of the environmental conditions in the steel fettling shop of the South African Railways at Pretoria and the results of an investigation of atmospheric dust carried out with the konimeter, thermal precipitator and electrostatic precipitator are reported. Konimeter samples taken near the breathing zone of each of 9 fettlers using pneumatic chisels had a mean count after ignition and immersion of 400 particles per cc. and 2 samples taken similarly near fettlers using grinding wheels after ignition and immersion showed 460 and 600 particles per cc. respectively. Ninety-five per cent of particles collected in the thermal precipitator after ignition were less than 2 microns in size. A sample of dust obtained in the electrostatic precipitators yielded 13% of free silica and a specimen of molding sand was shown to contain 55% quartz and 18-20% cristobalite. The total number of workers examined by x-ray was 69 and 53 of them had less than 10 years exposure; in this group only one case of pneumoconiosis was discovered. There were, however, 2 cases among the 12 men who had been exposed from 10-20 years and the 4 men who had been exposed for more than 20 years all showed radiological changes. Of these 7 cases one man with 30 years exposure died after a pneumonectomy for carcinoma of the lung and postmortem examination revealed silicotic nodules. Another man with 30 years foundry experience of which 12 years had been spent as a fettler had extensive nodulation of both upper zones with massive shadow formation, especially on the left side, consistent with tuberculosilicosis. However, cultures were negative for tubercle bacilli and he is still carrying on at work.

-- Cond. from Bull. Hyg.

- 549 Pneumoconiosis. M. S. Kapur. *J. Indian Med. Assn.* 37, 433-435 (Nov. 1961). (Journal of the Indian Medical Association, Samavaya Mansions, Corporation Place, Calcutta 13, India*).

This paper gives the details of the clinical findings and the results of laboratory investigations in 21 coal workers admitted with chest complaints to the Central Hospital, Dhanbad, India, during 1960. One of the patients was a female who had not worked underground. Shortness of breath was present in all cases, and cough in 20 cases. Fever was the chief complaint at time of admission in 10 cases; in 7 there was a history of hemoptysis of moderate to severe degree. Radiological examination revealed 2 patients with large opacities. One patient had linear opacities only, the others micronodular shadows. Ten cases were diagnosed as pulmonary tuberculosis, but in only one was the tubercle bacillus found in the sputum. -- Bull. Hyg.

- 550 Methods of Preparation of Silica-Containing Dusts for Use in Biological Research. E. Occella and G. Maddalon. *Med. lavoro* 52, 382-390 (May 1961).

The mineralogy laboratory of the Clinica del Lavoro of Milan University has prepared a series of samples of fine silica-containing or inert dusts, classified and defined granulometrically, for the study of the etiology of silicosis and for a variety of experiments in the field of biological research. The sources of origin and of synthesis of the prime materials (quartz, opal, diatomaceous earth, chalcedony, tridymite, cristobalite, silica glass) are reviewed, together with grinding techniques and methods of classification used to obtain dusts granulometrically mostly of less than 3 microns diameter. The control of the purity of the final products is also discussed.

-- APCA Absts.

- 551 Biochemical Response of the Peritoneal Mucosa to the Irritant Action of Finely Divided Silica and Other Dusts. T. R. Parsons and O. F. Denstedt. *Can. J. Biochem. and Physiol.* 39, 1515-1523 (Oct. 1961).

The biochemical effects of various dusts including quartz, carbon and carborundum were tested by the examination of the peritoneal exudates after repeated intraperitoneal injections in groups of rats. The blood serum was examined at the same time. The preparation of the materials, the analytical methods and the procedures of injection are described. The peritoneal

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exudate in the animals treated with quartz differed from that of the other group in the content of glucose, lactic acid and alpha-amino nitrogen, while there was no difference in the blood serum of the animals in these respects. The alpha-amino nitrogen was greatly increased in the exudate of the animals treated with quartz. This points to an impairment of the mechanism for removing crystalloidal and colloidal materials from the peritoneal fluid. A test was made by using phenol red: this material was retained longer in the exudate of the rats treated with quartz. Silicic acid sol was prepared by a method which is described and repeatedly injected intraperitoneally in rats. Peritoneal cavities remained normal: there was no edema. The pathogenic action of silica is therefore due to the irritant action of the particles and not to the silicic acid dissolved in the tissue fluid. The increase in the alpha-amino nitrogen in the exudate of animals treated with quartz signifies proteolysis. The antiprotease activity in the serum of animals receiving quartz and carbon was investigated. Carbon had little or no effect. Quartz induced an increase in the inhibitor activity up to the 5th day after injection; this activity returned to normal on the 9th day. The connection between these observations and the tuberculosis which often accompanies silicosis is discussed as are the cases described in workers making abrasive soaps.

-- Cond. from Bull. Hyg.

- 552 Separation and Analysis of Dust in Lung Tissue. N. A. Talvitie and L. W. Brewer. Am. Ind. Hyg. Assn. J. 23, 58-61 (Jan.-Feb. 1962).

A coordinated procedure has been developed for the separation and subsequent x-ray diffraction analysis of dust in lung tissue. The tissue, preserved in 10% formalin, is dried at 110°C. and then defatted with an azeotropic mixture of methyl alcohol and chloroform. Organic matter is destroyed by digestion on a hot plate with 30% hydrogen peroxide in the presence of an antifoaming agent. The dust, with or without added internal standard, is dispersed ultrasonically with the aid of a wetting agent and mounted for x-ray diffraction analysis by filtration of the suspension through a membrane filter disc. The method is applicable as a standard, routine technique to the analysis of relatively small specimens of lung tissue submitted for confirmation of pathologic findings.

-- Authors' abst.

- 553 Differential Diagnosis of Pneumoconiosis and Coniotuberculosis. T. S. Osetinskiy, et al. Vestnik Rentgen. i Radiol. 36, 30 (Sept.-Oct. 1961). (Vestnik Rentgenologii i Radiologii, Medgiz, Gosudarstvennoe Izdatel'stvo Meditsinskoi Literatury, Petrovka 12, Moscow, USSR*).

The authors found that tomography made it possible for the first time to detect the tuberculous changes in 12 of 131 patients with first and second degree siderosilicosis. In some patients, the roentgenographic changes attributed to tuberculosis proved to be silicotic after histologic examination. The authors concluded that tomography should be used on all patients with pneumoconiosis. The final diagnosis should be based on combined roentgenological, clinical, and laboratory findings.

-- J. Am. Med. Assn. Foreign Mail

- 554 Serum Proteins and Serum Glycoproteins in the Differential Diagnosis of Silicosis and Silicotuberculosis. H. Oyanguren, et al. Brit. J. Ind. Med. 19, 131-133 (Apr. 1962).

The serum proteins and glycoproteins in 73 males were investigated with the object of deciding which tests differentiated most clearly between "pure" silicosis and silicotuberculosis. None of the tests was entirely satisfactory as, although significant differences between the averages for the various groups were found, the scatter of the individual results was so wide that the tests were not considered useful in individual cases.

-- Authors' abst.

- 555 Dust Control in the Asbestos Textile Industry. B. F. Postman. Am. Ind. Hyg. Assn. J. 23, 67-74 (Jan.-Feb. 1962).

This presentation covers experiences in 6 asbestos textile plants during the past 25 years. Two important and moderately involved dust control problems are discussed for carding units and dry weaving looms. Invariably, permission has not been granted to obtain photos

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or to evaluate engineering performance of installed asbestos dust control installations. Information covering some modern technical advances in asbestos dust control have been provided through the courtesy of the Asbestos Textile Institute. -- Author's summary

- 556 Rheumatoid Pneumoconiosis (Caplan's Syndrome) in an Asbestos Worker. W. G. Telleson. Thorax (London) 16, 372-377 (Dec. 1961).

This case of Caplan's syndrome occurred in a man aged 39, who had been employed at one time in a factory making asbestos-cement sheets and moldings. In March, 1959 he had an attack of pneumonia; x-ray examination at that time showed unusual shadows in his right lung fields. These remained unchanged on his complete recovery from the pneumonia. In June, 1959 exploratory thoractomy was performed. Three masses were excised. The larger lesions were cavitated. Histological findings showed that this was a case of Caplan's syndrome and the presence of asbestosis bodies showed that the cause of the fibrosis was asbestosis. The patient made a good recovery, but from June, 1960 he had pains in his shoulders and in December had pain and swelling in his right index finger. The Rose-Waaler test was now positive. Comparison is made of this case with that reported by Richards and Barrett (Bull. Hyg. 34, 55, 1959) in which both the typical x-ray shadows and rheumatoid arthritis were present when the case was discovered. In the present case the pulmonary lesions may have been present without rheumatoid arthritis for less than 4 years. Comment is also made on the absence of the x-ray findings regarded as typical of asbestosis, but this is not very unusual. -- Bull. Hyg.

- 557 The Importance of Bentonite and Kaolin in Industrial Medicine, together with a Report on the Question of Intratracheal or Intraperitoneal Tests. H. Gärtner and W. Herzog. Arch. Gewerbepathol. Gewerbehyg. 18, 524-537 (1961). German.

Three problems were studied by animal experiment: whether bentonite can be dangerous in industrial conditions, whether kaolin is safe and whether dust injected intratracheally and intraperitoneally results in different reactions. The question was investigated by injecting intratracheally into rats bentonite dust containing an insignificant amount of free silica. Three days later the same animals had an intraperitoneal injection of the dust. The animals were killed at varying intervals and studied. In both lungs the peritoneum nodes were produced which showed some reticular change at the edge of the nodes. No great difference was found in the reaction of the 2 sites. Nodes in the peritoneum were perhaps larger. No collagenous fibrosis was found. The conclusion is that no danger could arise from the getting and working of bentonite. Kaolin as a cause of industrial fibrosis has been described by various authors. The present experiment made use of a kaolin dust which contained some free silica; the same procedure was followed by a practically simultaneous injection of dust intratracheally and intraperitoneally. According to the length of time between these injections and the investigation of the effects, the number of nodules in the lung increased, showed more confluence and more distinct collagenous fibrosis. In the peritoneum the picture was the same but the nodes had progressed further. The conclusion is that the findings in the lung and peritoneum differed quantitatively but not qualitatively. -- Cond. from Bull. Hyg.

- 558 A System for Exposure of Mice to an Atmosphere Containing Carbon Particles. E. G. Comstock, R. R. Rue and J. H. Gast. Am. Ind. Hyg. Assn. J. 23, 88-90 (Jan.-Feb. 1962).

A simple laboratory system and method of exposing small animals to varying concentrations of carbon particles in the atmosphere are described. The system requires no expensive, special equipment and, at the same time, permits selection of different particle-size ranges and particulate concentrations. Carbon particles may function as carriers of gaseous toxicants and thus the system permits of studies of this mechanism. -- Authors' abst.

03121048

IN RE: ABRAMS November 1962

NW88-0019108

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 559 Effects of High Temperature Environmental Conditions on Human Performance. C. R. Bell and K. A. Provins. *J. Occ. Med.* 4, 202-211 (Apr. 1962).

The degree to which difficulty experienced in performing a task contributes to the effects of an uncomfortably warm environment has not been adequately examined by many investigators. The lack of satisfactory indices of experienced effort or cost of performing psychological tasks under adverse environmental conditions leads to difficulty in trying to assess the effects on the subject of climate. Experimenters have in the main, paid little attention to subjective assessments of the cost of performance in high-temperature conditions, whether or not deterioration in performance scores has been recorded. Where heat effects on sensory-motor performance has been found, it appears that heat may directly influence the muscular aspects of performance and produce a deterioration by reducing the manipulative ability of the subject. In most studies the results support the general hypothesis that performance deterioration in heat is dependent upon the cost of performance to the subject. In vigilance tasks, the deterioration in performance in prolonged exposure to heat may be related to the subject's feelings of "sluggishness and fatigue", reported by Viteles and Smith, which could lower alertness and "irritability and discomfort", which could distract attention from the task. When, on the other hand, exposure to, or performance in, adverse environmental conditions is relatively brief, a demonstrable deterioration in performance appears less probable because: (1) continued exposure may be necessary for thermal imbalance of the body and feelings of discomfort to reach significant levels; (2) exposure to the experimental conditions may have a temporary incentive effect on performance. There are 80 references to the subject in the bibliography.

-- Cond. from authors' conclusions

- 560 Physiological Hazards of Skin Diving. G. D. Davis. *Med. J. Australia* 2, 1035 (Dec. 30, 1961).

The majority of problems encountered in diving are either a direct result of water pressure, or the effect of a combination of water pressure and inhaled gases. The physiological hazards of skin diving are discussed in such a way that the general practitioner, faced, as he will be, by an increasing number of patients inflicted with injuries from the sport, will be able to recognize and treat the injuries, and perhaps more important, will be able to advise how to avoid further injury. The dangers discussed are pressure effects on the eardrums and sinuses, ruptured alveoli and air embolism, pneumonitis, carbon dioxide accumulation, nitrogen narcosis, diver's paralysis, oxygen poisoning, accidental drowning, and the rare but dangerous accidental filling of cylinders with the wrong gas. Precautions are suggested for minimizing these hazards.

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

- 561 Observations on Personnel Working with Fluorine at a Gaseous Diffusion Plant. J. S. Lyon. *J. Occ. Med.* 4, 199-201 (Apr. 1962).

No impairment to health of people working in fluorine concentrations probably considerably in excess of 0.1 ppm has been demonstrable from their medical records at the installation investigated in this paper. It is recognized that this is not a definite epidemiological study and that there are many sources of possible error. It is hoped that the magnitude of the differences found lend the results sufficient validity to encourage the re-evaluation of the presently recommended exposure limit for fluorine in air.

-- Author's comments

03121019

- 562 USAF Environmental Health Laboratory in the Missile Program. R. L. Peterson.
J. Occ. Med. 4, 252-255 (May 1962).

The United States Air Force in recognizing the advantages of, and need for, a comprehensive environmental health laboratory capable of supporting its occupational and preventive medicine program, has maintained such services for many years. Some of the technical problems currently being solved by these laboratories have been discussed. In the missile program a continuing series of environmental health programs are anticipated with the advent of each new operational concept, new apparatus, new configuration, and change in propellants.

-- Author's summary

RADIOACTIVITY AND X-RADIATION

- 563 Radioactivity in Foods. II. Evidence of Fallout Contamination During 1958 and 1959.
E. P. Laug, et al. J. Assn. Offic. Agr. Chem. 44, 523-530 (Aug. 1961). (Journal of the Association of Official Agricultural Chemists, Box 540, Benjamin Franklin Station, Washington 4, D. C.*).

During 1958 and 1959, approximately 5,000 samples of 50 different human and animal foods were examined for total radioactivity resulting from fallout. Highest total concentration was found in animal fodders and tea. Among the animal fodders, the alfalfas were about 4 times as radioactive as the corn ensilages. In the case of tea, the imports from Japan, Formosa, and India carried the greatest amount of radioactivity. Significantly lower concentrations were noted in African and Brazilian teas. Lower, in comparison by factors ranging from 1/10 to 1/100 of the above but still measurable, was the radioactivity in fresh vegetables. Most of the contamination was found in spinach, celery, lettuce, and greens in that decreasing order. As compared to fresh vegetables, fruits were on the average only 1/7 as radioactive. Measurable quantities of radioactivity were found only in plumes, prunes, and strawberries, in that decreasing order. As noted in an earlier surveillance study, significant radioactivity continued to be detected in dairy products; also in oysters and clams. Insignificant traces of radioactivity were found in salmon and tuna, and none whatsoever in meat and poultry. Nearly all total beta concentrations declined from 1958 through 1959, reflecting the cessation of weapons testing late in 1958. Analyses showed that on the average, about 10% of the total beta level in a food could be accounted for by the presence of strontium-90. Ten tables are included in this report.

-- Nuclear Sci. Absts.

- 564 Use of Statistical Methodology in Environmental Monitoring. G. W. Kerr.
Am. Ind. Hyg. Assn. J. 23, 75-82. (Jan.-Feb. 1962).

The objectives of the environmental monitoring program conducted at the Connecticut Aircraft Nuclear Engine Laboratory are presented with a description of the program as it is presently being conducted. Information on the selection of sampling locations and of a proper sampling frequency is given. Some new approaches using statistical methods in the analysis of environmental monitoring data are presented. Statistical methods including quality control techniques, "t" tests and analysis of variance are described in relation to the analysis of data to detect significant changes and trends.

-- Author's abst.

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- 565 Removal of Radioactive Contaminants from Water. D. C. Lindsten, R. P. Schmitt and W. J. Lacy. Military Engr. 53, 368-369 (Sept.-Oct. 1961). (Military Engineer, Society of American Military Engineers, The Mills Building, 17th and Pennsylvania Avenue, N.W., Washington 6, D.C. *).

A study was made to evaluate field water treatment procedures for removing radioactive contaminants from a natural water source. Although the water treatment equipment was designed for support of military operations, the basic processes of coagulation, filtration, and ion exchange make it suitable for use in civilian installations. -- Nuclear Sci. Absts.

- 566 Food and Water Supply in Nuclear War. T. R. Ostrom. Military Med. 126, 767-771 (Oct. 1961).

With existing supplies, it is possible to provide food and water for military and civilian populations after a nuclear attack. There are extant methods for decontaminating water, livestock, and packaged foodstuffs. -- Nuclear Sci. Absts.

- 567 Is All Nuclear Radiation Harmful? H. F. Henry. J. Am. Med. Assn. 176, 671 (May 1961).

Examination of the available data does not support the hypothesis that decreased longevity will result from continuing low-radiation exposure. Human and animal studies for detection of somatic injury as evidenced by life shortening indicates there is an exposure threshold below which radiation exposures may be safely received. Animal data suggest this threshold is about 0.5 - 1.0 rem. per day. This conclusion of a possible threshold effect is of particular interest for many nongonadal depositions of internal emitters, such as alpha-emitting uranium, plutonium, and thorium which are of concern primarily, for somatic effects. In genetic-effect experiments on mice, which are probably the most nearly applicable to man at present, it has been shown that increased mutation rates which vary with the rate of exposure occur at levels down to 10 rad. per week. In recommendations for safe exposures to penetrating radiations, the consideration of genetic mutations and their over-all effect on race survival are most important even though based largely on speculation. -- J. Occ. Med. Absts.

- 568 Medical Supervision of Workers Who May Be Exposed to Radiation. G. L. Voelz. J. Occ. Med. 4, 212-220 (Apr. 1962).

A review of recommended practices for medical supervision of workers potentially exposed to radiation does not disclose significant differences from standard comprehensive industrial medical practice. The areas of special interest on pre-placement and periodic examinations are primarily an evaluation of previous radiation exposures and the diagnosis of certain conditions which may be confused with delayed radiation effects. Physical requirements of the job, apart from radiation considerations, often become more important in job placement and work limitations than the problems associated with radiation. The number of medical conditions which require that the employee be limited with respect to potential radiation exposure are surprisingly small. The radiological health program must put major emphasis on establishing adequate means for measuring external and internal radiation doses, since clinical changes as such occur only after acute excessive exposures. Careful monitoring of radiation levels in the plant is essential to keep exposures at minimal levels. In the final analysis, however, careful medical supervision remains the essential means of evaluation; this, combined with the health physics data, will allow the physician to attest to the health of his patient.

-- Author's summary

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03121051

- 569 Radiation Fallout and Its Health Implications. R. D. Connor.
Can. J. Public Health 52, 333-337 (Aug. 1961).

Discussion is given on the natural settling and decay patterns of fission products resulting from nuclear detonations. The effects of nature in reducing radioactive concentration levels, the relationship of fallout effects to population with respect to the somatic and genetic considerations, and the possible need for re-evaluation of radiation effects is also indicated, particularly in the area of low level irradiation of general population.

-- Nuclear Sci. Absts.

ENVIRONMENTAL MEASUREMENTS

- 570 Flame Ionization Hydrocarbon Analyzer. R. A. Morris and R. L. Chapman.
J. Air Poll. Control Assn. 11, 467-469, 489 (Oct. 1961).

The instrument, operation, sample conditions, and application are discussed. The principle is based on the ionization produced when even trace quantities of organic compounds are introduced in a flame of pure hydrogen which contains essentially a negligible number of ions. At constant flow rates, the ion current from a collector electrode is proportional to hydrocarbon concentration. Determinations from 0.1 ppm to 25% are possible, but accurate analysis below 20 ppm requires an experienced operator.

-- Public Health Eng. Absts.

- 571 Low Velocity Gas Liquid Impinger for the Continuous Estimation of Sulfur Dioxide and Other Atmospheric Pollutants. T. Nash. J. Sci. Instr. 38, 480-483 (Dec. 1961).

The instrument records sulfur dioxide conductimetrically in the range 0.01 - 10 ppm where rapid changes in concentration can be expected but the accuracy required is not more than 1 in 20. Sampling is continuous and cumulative, with a return to initial conditions 2 or 3 times an hour. The principle of operation is the removal of a soluble vapor from an air jet impinging on to an unbroken liquid surface. One modification of the instrument measures light absorption instead of conductivity, permitting the use of colorimetric reagents.

-- APCA Absts.

- 572 Gas Chromatographic Analysis of Aromatic Hydrocarbons at Atmospheric Concentrations Using Flame Ionization Detection. A. P. Altshuller and C. A. Clemons.
Anal. Chem. 34, 466-472 (Apr. 1962).

The hydrogen flame ionization detector is used in the gas chromatographic analysis of C₆ to C₁₀ aromatic hydrocarbons in automobile exhaust. Sensitivity is great enough to permit analysis of dilute exhaust and synthetic "smogs". Photochemical reaction due to solar radiation reduces the hydrocarbon concentration in air.

-- AC Briefs

- 573 Atmospheric Ozone in Northern Greenland. H. C. McKee.
J. Air Poll. Control Assn. 11, 562-565, 584 (Dec. 1961).

An investigation was made for the U.S. Army Ordnance Corps to determine the reason for excess rubber cracking in Greenland. Meteorological conditions are discussed. Experimental procedures are outlined. Rapid changes in weather conditions interfered with some sample runs. Ozone determinations using phenolphthalin methods produced best results and potassium iodide method was unsatisfactory. Ozone concentrations are given for Camp Tuto, Greenland.

-- Public Health Eng. Absts.

03121052

- 574 Modern Concept of Analytical Chemistry in Industrial Hygiene and Problems for the Future. J. Cholak. *Am. Ind. Hyg. Assn. J.* 23, 26-29 (Jan.-Feb. 1962).

The role of chemistry in the practice of industrial hygiene is discussed. Responsibilities of the industrial hygiene chemist in the day's work and his participation in planning of investigations are outlined. Specific techniques and current trends are also described.

-- Author's abst.

- 575 A Simple Carbon Dioxide Analyzer. J. P. Lodge, Jr., Evelyn R. Frank and J. Ferguson. *Anal. Chem.* 34, 702-704 (May 1962).

A device for the measurement of carbon dioxide in gases has been adapted for measurement of carbon dioxide at atmospheric concentrations. Fine marble chips are suspended in continually aerated distilled water, and the equilibrium pH is measured by an expanded-scale pH meter. Performance of the device has been compared with that of a nondispersive infrared analyzer and found to be substantially equivalent. The cost of the device is markedly less, however, than that of the infrared instrument.

-- Authors' abst.

- 576 An Improved Continuous Internal-Electrolysis Analyzer for Gaseous Fluorides in Industrial Environments. O. H. Howard and C. W. Weber. *Am. Ind. Hyg. Assn. J.* 23, 48-57 (Jan.-Feb. 1962).

An improved, inexpensive analyzer has been developed for the continuous determination of gaseous fluorides in industrial environments. The instrument records concentration peaks not detectable by conventional methods. Fluorides, absorbed from the air by a dilute acid solution, produce an electric current in a sensitive, aluminum-platinum, internal-electrolysis cell. The continuous signal is readily recorded, or is indicated, without amplification, on a microammeter. The range of the analyzer, which responds to all substances which will yield fluoride ion in the scrubbing solution, is 0.05 to 80 micrograms of fluoride per liter of air. The initial-response time of the analyzer is about 30 seconds at 2 micrograms F- per liter. Elemental fluorine is determined up to 10 micrograms per liter by the addition of an iodide reductant to the scrubbing solution. The only recognized interference is chloride which contributes a significant positive bias when fluoride is at low concentrations. The instrument is readily calibrated with standard aqueous solutions of fluoride. The analyzer-recorder will operate unattended for extended periods; normal maintenance consists of replenishment of the scrubbing solution and renewal of the recorder chart.

-- Authors' summary

- 577 Laboratory Evaluation of Sulfur Dioxide Methods and the Influence of Ozone-Oxides of Nitrogen Mixtures. F. P. Terraglio and R. M. Manganeli. *Anal. Chem.* 34, 675-677 (May 1962).

A laboratory evaluation of three wet-chemical methods used to measure atmospheric sulfur dioxide concentrations showed that the acidimetric and spectrophotometric methods gave comparable average recoveries over the concentration range of 0.3 to 3.78 mg. of SO₂ per cubic meter. Recoveries by the iodimetric method over the same concentration range were lower than the spectrophotometric method. The presence of ozone-oxides of nitrogen mixtures interfered with all three methods.

-- Authors' abst.

- 578 Determination of Antimony by the Ring Oven Technique. P. W. West and A. J. Llacer. *Anal. Chem.* 34, 555-558 (Apr. 1962).

The development of the ring oven technique now offers the possibility of providing relatively simple and rapid methods for separating, concentrating, and determining trace amounts of antimony collected during air pollution and industrial hygiene studies. The maximum allowable concentration for antimony has been given as 0.1 mg./cu.m. of air. For convenience in sampling, a method sufficiently sensitive for samples of 1 cubic foot would be ideal. In terms of absolute amounts of antimony, this requires a sensitivity of 2.8 micrograms. A sensitivity of 1 microgram per cubic foot as a minimum sensitivity would be more realistic so that an amount substantially less than the maximum allowable concentration could be determined easily.

-- APCA Absts.

03121053

- 579 Modern Concepts of Air Sampling and Problems of the Future. H. F. Schulte.
 Am. Ind. Hyg. Assn. J. 23, 20-25 (Jan.-Feb. 1962).

Air sampling is still an empiric art rather than a science. Its basic principles need to be elucidated. New developments in the field include detector tubes whose limitations must be recognized, personal samplers to be worn by an individual, installed sampling systems, selective size samplers and much associated equipment. Future work must associate the sample with the exact disease-producing environmental factor. More information is needed on movement of particles with reference to air flow line and on the application of statistics to sampling techniques and evaluation of data.

-- Author's abst.

PREVENTIVE ENGINEERING

- 580 In-Service Solvent Cleaning of Electric Motors. D. L. Stoddard and W. R. Wells.
 Am. Ind. Hyg. Assn. J. 23, 62-66 (Jan.-Feb. 1962).

Safe handling of large amounts of hazardous cleaning solvents and the resultant vapors made possible the development of a method for cleaning electric motors while in service under normal load, without interrupting their operation, thereby extending their expected "use life". The cleaning was done successfully with several different solvents. Motors as large as 200 horsepower were cleaned with the expenditure of approximately 2 man hours of labor and \$7.35 for materials per motor.

-- Authors' conclusions

- 581 Better Ventilation for Close-Quarter Work Spaces. R. S. Brief, et al.
 Air Cond. Heat. & Vent. 58, 74-88 (Sept. 1961).

The authors made a study of the ventilation requirements for welding and torch cutting within oil refinery equipment, especially refinery towers of considerable height. The work was done in 2 refineries of the Humble Oil & Refining Company—one in Baton Rouge, La., during the summer, and another in Bayway, N. J., during the winter. In the first plant, the evolution of heat during operations was a factor which was studied in relation to the ventilation which was provided. Fume concentrations during work on carbon and stainless steels was the major subject of investigation in both refineries. As might be expected, ventilation was most efficiently applied when the fumes were removed in a direction away from the welders. It was found that upward flow of air was best when overhead welding was being done, and that down draft ventilation produced the best results when down hand welding was performed. When several welders were working at different levels within the same vessel, the problem of keeping the fumes produced by one welder from entering the breathing zone of the other offered some difficulty. The rate of ventilation and the concentrations of fumes with various ventilation arrangements was determined. The concentrations represent steady states during which time the quantity of fume produced was approximately equal to that removed. On the basis of these data, a nomograph was devised which makes it possible to determine in advance the ventilation required for various kinds of welding and torch cutting. It was found that providing sufficient ventilation for particulate welding fumes was also sufficient to control heat produced when ambient temperatures were below 90°F. Additional air or cooled make-up air would be necessary for prolonged torch cutting.

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

- 582 Planning Ventilation for Nuclear Reactor Facilities. B. J. Held.
 Am. Ind. Hyg. Assn. J. 23, 83-87 (Jan.-Feb. 1962).

The problems and waste which result from poor design and lack of forethought in planning ventilation of industrial operations are discussed. A 4-point program to achieve good initial design is presented: (1) written required design criteria, (2) review by separate responsible specialists for health and safety, (3) periodic surveys and review of modifications, and (4) written operating requirements.

-- Author's abst.

03121054

COMMUNITY AIR HYGIENE

- 583 Air Contamination: A Respiratory Hazard. S. M. Farber and R. H. L. Wilson.
J. Am. Med. Assn. 180, 362-366 (May 5, 1962).

Health hazards due to contamination of the atmosphere are not limited to the immediate effects of severe episodes. Air pollution plays an important role in the etiology of lung cancer and is linked to cancer of other sites. It is a major cause of bronchitis and can be implicated in many other diseases of the respiratory tract. Continued study of the mechanisms involved demonstrate that these effects are not due to single factors in most situations but to multiple components differing widely from one city to another. Statistical and experimental studies of chronic exposure to common ambient levels of air pollution clearly demonstrate the serious health hazard represented by air contamination. -- Authors' abst.

- 584 Air Pollution and Public Health. W. McDermott. Sci. Am. 205, 49-57 (Oct. 1961).
(Scientific American, Inc., 415 Madison Avenue, New York 17, N. Y. *).

The author describes bronchitis-emphysema, a common disorder of the lungs and bronchial tubes. There is no solid evidence that bronchitis-emphysema is caused by any particular air pollutant, but it is aggravated by air pollution. Air pollution may, however, be a factor over a long period of time in causing this lung condition. Statistical evidence is cited from the Donora, Pennsylvania, disaster of 1948 and the London disaster of 1952, to demonstrate the aggravation of bronchitis-emphysema by air pollution. The contribution of the automobile to air pollution is mentioned. In urban areas there are significant amounts of hydrocarbons and nitrogen oxides and amounts of carbon monoxide, sulfur oxides and other compounds of doubtful significance. Highly pulverized rubber and asphalt resulting from auto tire abrasion is believed to contribute appreciably to air pollution. The effect of air pollution on the incidence of lung cancer is sought in statistics of cigarette-smoking British emigrants to New Zealand who have a higher lung cancer rate than smokers native to New Zealand. The sociological problems of instituting air pollution control laws are mentioned. -- Public Health Eng. Absts.

- 585 Area Meteorology, a Component of Air Pollution Studies. L. Greenburg and F. Field.
Arch. Environmental Health 4, 477-486 (May 1962).

An analysis of an air pollution incident in November, 1953, indicates that the weather pattern conducive to the unusually high air pollution levels in New York City, at that time, also influenced a major portion of the Eastern Atlantic Seaboard. Air pollution episodes of this nature wherein a stagnating anticyclone, great stability of the air mass, and inversion phenomena play an important role, have in the past been regarded only as local phenomena by nonmeteorologists. Because of the large area often involved in such meteorological patterns, it is suggested that in the conduct of epidemiologic studies greater consideration be given to the total geographic area involved. The effect of air pollution on morbidity and mortality, because of such meteorology, may be far greater than it has been suspected in the past.

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

- 586 Advantages of District Heating Schemes in Combatting Atmospheric Pollution. H. J. Herskind.
Fuel Econ. Rev. 40, 119-125 (1962).

In principal towns the added advantage of keeping air pollution at a low level is by cleaning the smoke as well as discharging it at such an altitude that it has no injurious influence. Another advantage is that the transmission of heat takes place in underground ducts which together with the location of the central heating station, must help to a degree in relieving traffic

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congestion by eliminating transport of solid fuel to inhabitants and removal of the ashes. In the establishment of the many district heating plants on the continent the initial steps have been made by governmental or municipal authorities, by the power stations, the suppliers of fuel, engineering firms, or contractors. The result of all these common interests becomes apparent in the many district heating plants which have been built upon the continent. -- APCA Absts.

MANAGEMENT ASPECTS

- 587 Periodic Health Examination: Evaluation of Routine Tests and Procedures. T. W. Clark, et al. Ann. Internal Med. 54, 1209 (1961).

The present study was made on the basis of clinical and laboratory findings in 1,513 persons who participated in the periodic health examination program of the Diagnostic Clinic of the University of Pennsylvania. The following results were analyzed: determination of hemoglobin; counting of leukocytes; examination of urine for sugar, protein, erythrocytes and leukocytes; determination of postprandial blood sugar; serologic test for syphilis; electrocardiogram; chest radiograph; and sigmoidoscopic examination. These diverse tests and procedures were evaluated on the basis of abnormalities ascertained by their performance, the contribution made by them to the ultimate clinical diagnosis, and the costs of the tests. It was concluded that, in the population studied, the serologic test for syphilis contributed little; that the urinalysis was useful in certain cases, especially when it revealed the presence of glycosuria; and that the determination of hemoglobin and the enumeration of leukocytes were useful in certain cases only. The usefulness of the determination of postprandial blood glucose, the electrocardiogram, the radiograph of the chest and the sigmoidoscopy was clearly demonstrated. A high percentage of false positive results were encountered in all the procedures with the exception of sigmoidoscopy. The impression was that, in general, if an abnormal report supported a clinical suspicion, it was accepted by the examiner, whereas if it came as an unexpected finding it might well be rejected. The "cheaper" tests frequently emerged as the more expensive ones, when viewed in terms of effectiveness in identifying disease. -- Cond. from Can. Med. Assn. J. Absts.

- 588 The Alcoholic in Industry—A Challenge. An Editorial. J. F. Jellema. J. Occ. Med. 4, 282 (May 1962).

The key to A.A.'s success has been the simple recognition that alcoholism is a problem in motivation, that its best treatment is "a way of life". Local A.A. groups are good clinics. The industrial physician can help with understanding, encouragement, treatment of secondary effects, and careful administration of the patient's program for sobriety. For the latter, Antabuse is an invaluable adjunct—but only when it is administered regularly by a scrupulously firm "collaborator". The conditions of industrial medical practice are ideal for the treatment of alcoholism. Statistically, industrial medicine is in the vanguard. Led by such firms as Consolidated Edison of New York, DuPont, New England Electric, and General Mills, to name a few, industry is approaching an impressive 80% effectiveness in treating alcoholism. That encouraging figure brings to mind what may be the most important characteristic of industry's treatment of alcoholism: it is ambulatory, on-the-job treatment. The fact suggests that the alcoholic can best be rehabilitated to the world by staying in the world. He does better without beds, social workers, desks, handlooms, forms-in-triplicate. The plant physician can check on his progress daily. This trend toward effective ambulatory treatment is not just good news for company economy. It is also significant to an understanding of alcoholism, it is a kind of vindication of the A.A. approach.

03121056

- 589 Sickness Absence in Teachers. J. Simpson. Brit. J. Ind. Med. 19, 110-115 (Apr. 1962).

This paper is based on the records of 738 male teachers and 1,084 female teachers employed by the Edinburgh Corporation during the academic year September 1, 1954 to July 31, 1955. The amount and distribution of sickness absence has been assessed by age and sex; and comparisons have been made with similar rates in the academic year 1950-1951 to determine trends in absence. An interesting feature is that the amount and duration of sickness absence experienced by single and married women teachers is equivalent. One finding of importance is that in both male and female teachers the highest inception rates for sickness are found at the beginning of a career in teaching. It is suggested that this supplies additional evidence that man's reactions to the situations he encounters in his daily life may affect his internal processes; that man's susceptibility to illness during adult life, is to a large degree, influenced by his relation to the society in which he works. The influence of promotion has been assessed in terms of this hypothesis.

-- Author's abst.

- 590 Sickness Absence in the Three Principal Ethnic Divisions of Singapore. C. P. Collins. Brit. J. Ind. Med. 19, 116-122 (Apr. 1962).

Records of sickness for all employees of H.M. Dockyard, Singapore, were analyzed over a calendar year, 1955-1956, with a view to producing a standard rate for sickness absence in the three main ethnic divisions of this area, with particular reference to age. Other factors, such as form or grade of employment and residence, were considered in order to test their effect, if any, upon sickness absence. The principal diagnostic groups were separated to give a general picture of the trends of sickness. The reactions of Chinese, Indians, and Malays to disease or to any of the associated factors were found to be totally dissimilar, and the possibility of this being due to chance is so slight as to be negligible. Comparisons are subsequently made with the other rather scanty record of another organization in South East Asia, and with detailed modern analyses of sickness absence in England. Again, it is found that absence rates for inceptions per 1,000 workers and days lost per worker differ entirely both as regards the total and individual disease groups and also in the effect of age. It is evident that the ethnic grouping of the population concerned must be taken into consideration in studies of sickness absence.

-- Author's abst.

- 591 Control of Absenteeism—A Cooperative Effort. H. R. Mushin. J. Occ. Med. 4, 256-257 (May 1962).

There is no one answer to the problem of absenteeism. The control of this expensive problem should begin at the school level and continue through the early years of work. The most stable employees appear to be those who have had several years of service. After age 25-35, there is again a considerable loss of time from work, but it derives from prolonged illnesses which are a consequence of many health factors. The role of the supervisor with his day-to-day, person-to-person contact with the employee is the key to absence control, but the team effort of management, supervisor, and medical department is necessary to be effective.

-- Author's conclusions

ACCIDENTS AND PREVENTION

- 592 The Discovery and Control of Ejection in Automobile Accidents. 792 Lives May be Saved Yearly if Properly Constructed Door Locks are Utilized in Automobiles. R. A. Wolf. J. Am. Med. Assn. 180, 220-224 (Apr. 21, 1962).

This paper collates results of 4 Cornell University studies of automobile accidents. Ejection of passengers was discovered to be a major cause of injury in 1954. Two "cures" for ejection were introduced: safety door latches and safety belts. A 1958 study estimated that

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5,500 lives could theoretically be saved annually in the United States if ejection could be eliminated. An evaluation of safety belt effectiveness in 1960 showed that major-fatal injuries could be reduced by 35% by using safety belts. Evaluation of safety door latches indicated that they were attaining about 32% of their ideal effectiveness. Calculations now indicate that door latches may actually be saving about 792 lives per year, while safety belts are saving about 64 lives per year.

-- Author's abst.

- 593 Hazards to Health. Missile Injuries Due to Power Lawn Mowers. E. M. Chazen and J. L. Chamberlin, III. New Engl. J. Med. 266, 822-824 (Apr. 19, 1962).

It has been estimated that sales of power lawn mowers in this country increased from 3,500,000 in 1947 to over 12,000,000 in 1958. Twenty million mowers are now thought to be in use. Of these, over 90% are of the rotary type, and less than 10% of the reel variety. Rotary mowers are by far the more dangerous type. The cutting bars rotate at 2,400 to 4,000 revolutions per minute. Objects in contact with the blades are hurled with velocities up to 300 feet per second. Injuries resulting from these machines are of 2 types: direct cutting; and contused or penetrating wounds from flying objects. Approximately 30% of all power-mower injuries are of the missile type. A survey of 241 such injuries by McClure, et al., revealed the lower extremities to be involved in 69%, the head, neck, and eyes in 23% and the trunk in 2.5% of the cases. Chief causes of injury by power mowers are faulty design of the mowers, with poorly designated danger points, carelessness on the part of the operator and missiles. Injury from flying objects is often to persons other than the operator. Awakening public awareness of the danger of power mowers has prompted a local ordinance in Louisville, Kentucky, that makes it illegal to employ anyone under the age of 18 to operate a power mower. Similar legislation has been proposed in New York, New Jersey, and California. In recognition of such a problem, the Outdoor Power Equipment Institute has suggested that a safety campaign be directed toward junior and senior high-school students. A seal of approval would be placed on every mower that measured up to the Institute's specifications. In the present paper, 4 cases of missile injury from power mowers are reported.

-- Cond. from authors' discussion

- 594 Development of Safety Performance Tests for Radioisotope Sealed Sources and Devices. P. C. Aebersold and J. W. Hitch. Health Physics (London) 7, 117-119 (Dec. 1961).

Discussion is given on a program aimed at anticipating possible hazards from the many types of sealed sources, as well as isotopic devices, and to perform tests aimed at providing information for more accurate assessment of the risks involved in permitting wide beneficial usage. It is suggested that such information should lead to safer sources and devices and yet not cause unnecessarily strict standards for fabrication or use. The program consists of development and testing of radioisotope sources to assure: integrity of containment of radioactive material within the sealed capsule or imbedding matrix, and that, should the integrity of containment fail, the source material itself will constitute a minimal risk of dispersal or biological absorption; and development and testing of isotopic devices to assure: integrity of source within the device against accidental loss or willful pilfering, and maintenance of an adequate degree of shielding under probable conditions of use or accident.

-- Nuclear Sci. Absts.

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