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Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL

MARCH, 1961
(Vol. 25, No. 3)

INDUSTRIAL HYGIENE FOUNDATION
MELLON INSTITUTE
4400 FIFTH AVENUE — PITTSBURGH 13, PA.

Industrial Hygiene Features

For a discussion on health and personality see Abst. No. 228.

What is expected of the professional person in litigation? See Abst. No. 229.

Abst. No. 233 is concerned with cardiovascular studies on lumberjacks.

Studies on occupational physical exertion and coronary atherosclerotic heart disease are presented in Abst. No. 234.

Abst. No. 238 discusses brucellosis of the bones and joints.

Centrilobular emphysema is surveyed in Abst. No. 241.

Consult Abst. No. 242 for information on the "toxin—antitoxin" phenomenon in burned and injured human subjects.

Effect of environmental temperature and humidity on lead poisoning in animals is the subject of Abst. No. 250.

The production of myocarditis by allylamines in animals is described in Abst. No. 254.

Toxic encephalopathy apparently related to the use of an insect repellent is the title of Abst. No. 256.

Data on the relation between lung dust and lung pathology in pneumoconiosis are given in Abst. No. 264.

Abst. No. 265 describes investigations on connective tissue in experimental silicosis and anthracosis.

See Abst. No. 266 for the prevention of "silica shock" by aluminum.

Abst. No. 272 is concerned with the physiological effects of carbon black.

Symptomatic pulmonary disease in arc welders is the title of Abst. No. 273.

Abst. No. 275 presents the effects of geographical origin on performance in heat.

Foundation Facts

NEWLY APPOINTED MEMBERS OF I-H-F TECHNICAL COMMITTEES:

Chemical-Toxicological	H. H. Fawcett, General Electric Co. George C. Reed, Minneapolis-Honeywell Regulator Co. William J. Wiswesser, Willson Products Div., Ray-O-Vac Co.
Engineering	P. J. Sherwin, Penna. Mfrs. Assn. Casualty Insurance Co. Herbert T. Walworth, Lumbermens Mutual Casualty Co.
Medical	Dr. J. P. Hughes, Kaiser Aluminum & Chemical Corp. Dr. S. D. Steiner, General Motors Corp.

TRANSACTIONS OF SILVER ANNIVERSARY MEETING of Industrial Hygiene Foundation held in Pittsburgh, Pa., on October 26-27, 1960, have been published as the complete March 1961 issue of the Archives of Environmental Health. Copies of these Transactions will be sent to all members of the Foundation.

NEW REPRINT: "Tuberculosilicosis: A Study of Its Synergistic Mechanisms", by P. Gross, M. L. Westrick and J. M. McNerney. Journal of Occupational Medicine 2, 571 (Dec. 1960). This reprint is available from the Foundation upon request.

26th ANNUAL MEETING
OCTOBER 25 - 26, 1961

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state and local governments 32%. The committee was appointed by Surgeon General Leroy E. Burney, at the request of Secretary of Health, Education, and Welfare, Arthur S. Flemming, after the National Conference on Air Pollution in November 1958. Copies of the report are available at the HEW Press Room, Washington 25, D.C. -- Science

214 AEC Series on Radiation.

The Atomic Energy Commission has published the first in a series of pamphlets describing its biomedical program, which is directed toward the accumulation of knowledge of the effects upon living things of nuclear radiation from any source—natural or man-made. The booklet, titled Marine Sciences Research, was prepared under the direction of the Commission's Division of Biology and Medicine. It summarizes work in progress at 13 institutions through 28 research contracts. The new publication is available at 50 cents a copy from the Office of Technical Services, U. S. Department of Commerce, Washington 25, D.C. The second and third series will be devoted to AEC genetics and cancer research programs. -- Science

215 Gerontological Journal.

The Gerontological Society, Inc., has authorized publication of a new quarterly journal to be known as The Gerontologist. It will be similar in format to the Journal of Gerontology. Publication will begin in 1961. The new publication will feature review articles, theoretical articles, historical articles, and articles dealing with current action programs. A dozen countries will be represented on the editorial board, emphasizing the international character of the enterprise. Oscar J. Kaplan, San Diego State College, San Diego 15, Calif., will serve as editor-in-chief. Manuscripts should be sent to him for consideration by the editorial board. -- Science

COMING EVENTS

216	Mar. 28-31	American Association of Anatomists, Chicago, Ill.
	Apr. 3-15	11th Medical Conference, Nassau, Bahamas
	Apr. 4-6	Electromagnetics and Fluid Dynamics of Gaseous Plasma, International Symposium, New York, N.Y.
	Apr. 4-7	Society of Automotive Engineers, Natl. Aeronautic Meeting, New York City
	Apr. 5-7	Annual Conference and Corrosion Show of National Association of Corrosion Engineers, Buffalo, N.Y.
	Apr. 5-7	Symposium on Ground Water Contamination. U. S. Public Health Service, Cincinnati, Ohio
	Apr. 6-7	Council on Medical Television, Annual Meeting, Bethesda, Maryland
	Apr. 7-8	Eastern Psychological Association, Philadelphia, Pa.
	Apr. 7-9	American Association for Cancer Research, 52nd Annual Meeting, Atlantic City, New Jersey
	Apr. 9-13	American Association of Cereal Chemists, Annual Meeting, Dallas, Texas
	Apr. 9-13	Annual American Industrial Hygiene Conference, Detroit, Michigan
	Apr. 9-14	American Industrial Health Conference, Los Angeles, Calif.
	Apr. 9-15	American Institute of Nutrition, Atlantic City, New Jersey
	Apr. 10-14	American Society of Civil Engineers, Phoenix, Arizona
	Apr. 10-15	Federation of American Societies for Experimental Biology, 45th Annual Meeting, Atlantic City, New Jersey
	Apr. 11-13	Institute of Environmental Sciences, Annual Meeting, Chicago, Ill.
	Apr. 12-13	Information and Decision Processes, 3rd Symposium, Lafayette, Ind.
	Apr. 12-14	Agglomeration, International Symposium, Philadelphia, Pa.

Apr. 13-14	Society of Technical Writers and Publishers, 8th Annual Meeting, San Francisco, California
Apr. 17-19	7th National ISA Symposium on Instrumental Methods of Analysis, Houston, Texas
Apr. 18-20	Annual Convention, American Welding Society, New York City
Apr. 18-20	Chemical Reactions in the Lower and Upper Atmosphere, International Symposium, San Francisco, California
Apr. 18-21	American Geophysical Union and American Meteorological Society, Washington, D.C.
Apr. 20-22	Association of Southeastern Biologists, Lexington, Kentucky
Apr. 20-24	Microbial Reactions in Marine Environments, International Symposium, Chicago, Ill.
Apr. 23-27	39th Annual Convention of the Oil Heat Institute of America, Washington, D.C.

OCCUPATIONAL DISEASE STATISTICS

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

	Conn. Dec.	Pa. Jan.-Feb.	Tenn. Jan.	Total
Adhesive fumes			1	1
Anthraco-silicosis		18		18
Anthraco-silicosis (suspected)		1		1
Bronchial asthma		1		1
Carbon monoxide poisoning		1		1
Dermatitis	16*	24	12	52
Fumes (unidentified)		1		1
Paint fumes			1	1
Pneumoconiosis		90		90
Pneumoconiosis (suspected)		2		2
Poison oak		1		1
Polycythemia	1			1
Silicosis	1	3	1	5
Silicosis (suspected)	1	1		2
Tuberculosis		2		2
Total	19	145	15	179

* Causes are listed as follows:

Connecticut: Occupational dermatitis due to oils and greases and metal cutting compounds 4; occupational dermatitis due to solvents 2; occupational dermatitis due to other chemicals: glues 1, synthetic resins or resin compounds 3, miscellaneous 1; occupational dermatitis—other: infection 4, miscellaneous 1.

LEGAL DEVELOPMENTS

218 Illinois Radiation Installations are Checked.

Radiation exposure, that may affect the public health and safety, is of growing concern to the State Department of Public Health. Illinois is one of the first states to enact and implement a radiation protection act (July 1959). Responsibility for radiological health lies in the Division of Sanitary Engineering. Rules and regulations are being formulated and plans made to facilitate regular and periodic investigations and inspections of all radiation installations in the State. This includes nuclear reactors as well as industrial and medical installations. Total registered installations in the State now number 7,361, which includes hundreds of users of radioactive materials, such as cobalt, radium, iodine, gold, etc. An adequate inspection system is being initiated to follow up on licensees to determine if they are performing in accordance with their license for the use and possession of the materials. Toward the immediate goal of sufficient inspectors to carry out the new law, 14 qualified x-ray technicians have been employed by the Department. Prior to being placed in the field, these technicians have undergone a comprehensive training period consisting of lectures and demonstrations, review of basic nuclear physics, mathematics and instrumentation, all necessary in thorough checking of radiation installations. -- Am. Soc. Civil Eng., Sanitary Eng. Div. News

219 Commissioners Approve Pollution Survey of Washington Air.

Dr. Daniel L. Finucane, Director of Public Health, was given responsibility by the District of Columbia Commissioners on October 25 for a project to survey and monitor air pollution in the District of Columbia. The study, to be underway in a few months, will provide a continual check against pollution buildup to hazardous levels as well as data on extent of pollution, trends in air quality, and identification of agents responsible for definite injury, damage or nuisance. The Public Health Service will cooperate with the Weather Bureau, Department of Agriculture, Armed Forces Institute of Pathology, Maryland and Virginia Departments of Health and agencies of the District Government in carrying on the project.
-- Am. Soc. Civil Eng., Sanitary Eng. Div. News

220 Massachusetts Governor Approves Air Pollution Control District.

On October 3, 1960, a bill passed by the legislature of Massachusetts was approved by the Governor, thus establishing a Metropolitan Air Pollution Control District which includes the City of Boston and adjoining Communities. The State Department of Health is given authority for control of air pollution in the District and for promulgation of rules and regulations related to such control activities. The Act, among other things, provides for reimbursement to the State by taxing the residents of the communities comprising the District. Authority is given for the formation of other air pollution control districts within the Commonwealth of Massachusetts. -- Am. Soc. Civil Eng., Sanitary Eng. Div. News

221 No Benefits Advanced.

Is danger of future disability equivalent to disability? Vincent Glodowski, a grinder and sandblaster for Universal Rundle Corporation, developed silicosis, in its early stage, as a result of his work. He was not disabled and could have continued his regular job. His physician advised him, however, in order to prevent disabling silicosis, to change jobs. The employer let him do odd jobs, like cleaning the roof and cutting weeds. This involved a wage loss of more than $1.00 an hour. Gladowski filed a claim for disability benefits. The company insisted that he was entitled to recover under the State's Non-Disability Silicosis Statute, but not

for disability, since at the time of changing jobs he was not in fact disabled. He could have continued his regular work. The danger of future, not present, disability caused the change. Glodowski insisted his present health condition forced the change in order to prevent future aggravation, and he was therefore already disabled. The court held that loss of wages is not the determining factor. Glodowski could still do his old job. His only recovery, therefore, was under the Non-Disabling Silicosis Statute. Glodowski v. Industrial Commission. Wisconsin Supreme Court, 105 N. W. 2d 833 (Nov. 1, 1960). -- Occ. Hazards

222 Personal Work Compensable?

Robert Maheaux was a handyman for Cove-Craft, Incorporated. The company manufactured wooden sporting equipment and toys. On October 9, 1957, Maheaux was making a checkerboard for his own use. He used a table saw during his lunch hour. He had never used the saw before and was not too familiar with its operation. A flying chip gave him a permanent eye injury. The company maintained that since Maheaux was on his lunch hour and engaged in a personal project when he was hurt, his injury was not compensable. Maheaux argued that he had never been forbidden to use the saw for his personal use, that it was customary for employees to do this, and that his straw boss was talking to him at the time of the accident and said nothing about stopping. The court concluded that personal use of the saw was so common a practice it was a custom. Unless the employer expressly prohibited its use, any injury like Maheaux's was work-connected. Claim allowed. Maheaux v. Cove-Craft, Incorporated, New Hampshire Supreme Court, 164A 2d 574 (Oct. 4, 1960). -- Occ. Hazards

BOOKS, PAMPHLETS AND NOTICES

223 A Progress Report on the Photochemistry of Polluted Atmospheres. E. A. Schuck, G. J. Doyle and N. Endow. Report No. 31, Air Pollution Foundation, 2556 Mission St., San Marino, California. 112 pp. (Dec. 1960). No price given.

During the photooxidation of olefins, 3 reactions appear important: the reaction of olefins with oxygen atoms, with ozone, and with active intermediates. Active intermediates may be free radicals or zwitterions. The rate of disappearance of olefin, over and above that accountable by reaction with oxygen atoms and ozone, has been termed the "excess rate". The importance of active intermediates in the mechanism of olefin photooxidation is suggested by these observations: (1) Some products cannot be accounted for by simple rupture of the double bond. (2) The excess rate is proportional to the square root of the light intensity and to the square root of the initial nitrogen dioxide concentration. The major products of the photooxidation are produced by rupture of the double bond, leading to various carbonyl compounds. However, significant amounts of formaldehyde and acetaldehyde are formed from olefins in certain cases in which these compounds could not be formed by simple bond rupture. Secondary photooxidation of the initial products can also contribute to the products. Alkyl nitrites were identified among the minor products of olefin photooxidation. These nitrites are probably contributing to olefin oxidation since alkyl nitrites promote destruction of olefins as well as does nitric oxide or nitrogen dioxide. Other minor products identified were alkyl nitrates and epoxides. The amount of eye irritation caused by photooxidation of auto exhaust probably may be reduced most efficiently by control of olefins rather than by control of oxides of nitrogen. Approximately 50% of the eye irritation measured in auto exhaust mixtures results from the photooxidation of ethylene and propylene. The sensitivity and precision of the present method of measuring eye irritation and of the analytical methods available for measuring products must be improved if the results from synthetic experiments are to be correlated with conditions in the Los Angeles atmosphere. -- Cond. from authors' summary

224 Alcoholism. Anon. Metropolitan Life Insurance Company, New York. 8 pp. (1959).

Alcoholism, a serious health problem, is a condition that is characterized by uncontrollable or compulsive drinking. Until very recently it was common to think of alcoholics as people to be shunned, reproached, or ridiculed. They were considered by many to be immoral, weak-willed, or obstinate. But nowadays physicians and others who have made a study of alcoholism approach the problem differently. They realize that there is no point in scolding, shaming, or urging the use of will power alone because they know that once an alcoholic has taken a drink, he is literally unable to control his drinking even though he may realize that he is harming his health, endangering his job, and hurting people closest to him. Some business and industrial concerns are aware of the necessity for the study and control of the alcoholism problem, and have encouraged employees who need it to seek help. Those firms which have maintained alcoholism programs for reasonable lengths of time agree that such programs are well worth the effort. In the absence of alcoholism programs, co-workers and supervisors often cover up for the alcoholic in a misguided attempt to help. Moreover, fear of detection and possible dismissal keep many alcoholic employees from doing anything about their problem early when there is the best chance for recovery. Companies with alcoholism programs report that the programs more than pay for themselves in: (1) increased savings in terms of higher productivity, less waste, absenteeism, and fewer accidents, and (2) the creation of better employer-employee relationships which, in turn, lead to improved morale and greater efficiency.

225 Industrial Radiography. Anon. Occ. Health Bull. New Jersey Dept. of Health, Bureau of Adult and Occ. Health 5, No. 7, 8 pp. (No date given).

Industrial radiography is fast becoming the most important means of non-destructive testing and inspection of materials for the detection of flaws in castings, forgings and welds, as compared to the fluorescent and dye penetrant or the magnetic and ultrasonic inspection methods. There are numerous reasons for this. The 2 most important are the lower cost and the fact that a radiograph not only indicates a flaw but also shows the actual nature of the imperfection. However, the uses of radiation for radiography make up only a small percentage of all the uses of radiation in industry, but probably warrant closer control and more stringent steps for safeguarding personnel than do the other uses. There are many reasons for this, some of the most important being the large quantities used, high workloads, unskilled labor which is completely unfamiliar with radiation, and the wide variation in jobs in the case of open radiography. This, however, does not offer an excuse for high exposures. Those days are over—or should be. Today, there are no martyrs to the cause of developing a new and unknown field of radiation.

226 Health Statistics from the U.S. National Health Survey. Series B-No. 25. Hernias Reported in Interviews. United States, July 1957 - June 1959. U. S. Department of Health, Education and Welfare, Public Health Service, PHS Publication No. 584-B25. 22 pp. (Dec. 1960). For sale by Supt. of Documents, U. S. Gov't. Printing Office, Washington 25, D.C. 25 cents.

This report contains estimates of the number of persons with hernias and the disability resulting from this condition. It should be noted that the estimate of the national prevalence of hernias shown in this report, 14.9 cases per 1,000 population, is based on cases reported in household interviews. Thus, it includes only cases which the respondents are aware of, and which have given them some concern. In general, these are likely to be cases in which the hernia is visible, has caused discomfort, or has been detected by a physician on physical examination. No doubt a higher prevalence rate would be obtained if physical examinations for hernia were carried out on a representative sample of the national population. No effort was made to determine the specific type of hernia, since it was believed that most respondents would not be able to provide such information. Hence, in this report all forms of hernia are grouped together.

INDUSTRIAL MEDICAL PRACTICE

227 Sickness Absence Among Forestry Workers in the North of Scotland, 1958. D. McGregor. Brit. J. Ind. Med. 17, 310-318 (Oct. 1960).

Sickness absence records of 1,115 forest workers in the highlands of Scotland during 1958 were examined. Only absences of 4 days or more were considered. Two hundred and seventy of the workers were established and were therefore entitled to retirement pensions. There was a high proportion of older men among the established workers; but the sickness record of these men was generally better than that of the unestablished workers except in respect of cardiovascular disease, rheumatism, and arthritis. Among forest workers as a whole, accidents off duty accounted for more sickness absence than accidents on duty, a reversal of the finding in the male working population at large. The second most important cause of sickness absence was back troubles of all kinds. Among the male working population at large, the second most important cause of absence was bronchitis, a disease which among forest workers comes 13th on the list. A comparison was made between the sickness absence record of the highland forest workers and a group of telephone construction gang hands performing broadly comparable work (as regards health hazards) in the same area but whose members were drawn from more urban homes. In general, fewer forest workers than telephone gang hands went sick in 1958 for all common ailments except cardiovascular disease, a finding perhaps related to the greater average age of forest workers. When this difference in age was allowed for, it was found that the greatest difference between the 2 groups of sickness records was in bronchitis, cardiovascular disease, and peptic ulcer and gastritis, in that order, and was to the advantage of the forest workers. Next came the upper respiratory tract infections. The least difference was in accidents, septic conditions, and rheumatism and arthritis. -- Author's abst.

228 Health and Personality. A. A. Hutschnecker. Ind. Med. & Surg. 30, 56-68 (Feb. 1961).

Health is a state of balanced functioning, an inner drive of adaptation to the stresses of life. As long as an individual is emotionally and physically able to adjust to stress he can maintain a state of balance and will remain whole—that is, healthy. If a situation proves to be stronger than the individual, then something in the personality must break. This can be a physical or mental break. It will depend on the individual's ability to find his way out of the dilemma, by either breaking the situation, or by a process of readjustment—which means not simple compromise but a positive acceptance of a life situation or situations—without inner rebellion, resentment, or unconscious hostility and thereby allow his system to regain a state of balanced functioning. It is safe to say that the individual who is capable of accepting responsibility and can relate to his environment will be able to fulfill himself creatively, and because these people are capable of building mature goals of themselves, the chances are that they will remain wholesome. -- Author's summary

229 What is Expected of the Professional Person in Litigation. N. S. Symons. Am. Ind. Hyg. Assn. J. 21, 502-510 (Dec. 1960).

The author discusses the subject under the following headings: Who is an expert witness? Necessity of cooperation. The meaning of "opinion". Importance of preparation. Preparation by the expert. Purposes of pre-trial conference. The hypothetical question. Qualifications of the expert. Conduct of the expert witness. Role of the industrial expert. Conduct of the lawyer. Conclusion. The author suggests that the legal, medical and other scientific professions could be more vigorous in policing their own membership in order to eliminate, or at least minimize, any tendencies toward distortion and exaggeration, and in the presentation of either spurious claims or wholly unjustifiable defenses to obviously valid

Occupational Physical Exertion and Coronary Atherosclerotic Heart Disease. D. M. Spain, J. Occ. Med. 3, 54-58 (Feb. 1961).

Current studies indicate that sedentary occupational categories are more closely associated with coronary atherosclerotic heart disease than the more physically active job categories. Sudden or excessive physical exertion prior to the onset of acute coronary occlusion does not appear with any frequency greater than one might expect from coincidence. The frequency of coronary thrombosis in coronary atherosclerosis is unrelated to occupational physical activity or physical exertion. -- Author's summary

A Study of Diet, Blood Lipids and Vascular Disease in Trappist Monks. E. P. McCullagh and L. A. Lewis. New Engl. J. Med. 262, 359 (1960).

A detailed study of the diet, blood lipid patterns and clinical findings was carried out on members of 2 Trappist monasteries. While their diet was not extremely low in fat, it did have a very low animal fat content. The blood cholesterol levels in the monks were, on the average, considerably lower than those of healthy men of comparable ages in Cleveland, Ohio. The relatively low blood cholesterol levels apparently did not spare these men from arteriosclerosis or hypertension; indeed the data suggested that hypertension was more frequent in them than in comparable men of the same age in the general American population. Though one may accept that abnormally high cholesterol levels accelerate the progress of cardiovascular degeneration and arterial hypertension, *it does not necessarily follow that*, in the average person, diets unusually low in animal fats are beneficial. In the monks subjected to this study, it appeared evident that diets low in animal fat and associated with relatively low serum cholesterol levels over a long period of years were not sufficient in themselves to offset the advance of cardiovascular degeneration and arterial hypertension. -- Gen. Mec. Assn. J. Abstr.

Coronary Atherosclerosis as a Cause of Unexpected and Unexplained Death. An Autopsy Study [illegible] 1949 - 1959. D. M. Spain, Victoria A. Bradess and C. Monr. J. Am. Med. Assn. 174, 384-388 (Sept. 24, 1960).

The frequency of coronary atherosclerotic heart disease as a cause of sudden unexplained and unexpected death in adults was determined in a series of 1,320 consecutive autopsies. "Sudden deaths" were divided into 3 categories according to the duration of the fatal episode: less than one hour, between one and three hours, and undetermined (unwitnessed). In the acute episodes lasting less than one hour, 422 of 463 adult white males and 32 of 66 white females died from coronary atherosclerotic heart disease. In the unwitnessed fatalities and where the episodes were over one hour, coronary atherosclerosis was the cause of death in more than 80%. Cerebral hemorrhage as a cause of sudden death was similarly studied. There were only 14 cases of cerebral hemorrhage of 584 witnessed sudden deaths. -- Authors' abst.

[illegible] Dermatitis. G. E. Morris. New Engl. J. Med. 263, 30 (July 7, 1960).

Allergy to nylon fabric may be due to dyes, finishes, or virgin nylon. Six cases of dermatitis with positive patch tests to virgin nylon are reported. One of these cases was occupational, due to contact with a nylon telephone cord. -- J. Occ. Med. Abstr.

[illegible]osis of the Bones and Joints. F. J. Kelly, et al. J. Am. Med. Assn. 174, 347-353 (Sept. 24, 1960).

Brucellosis of the bones and joints appears to be primarily a disease affecting men engaged in occupations related to animal husbandry. No single criterion leads to the working diagnosis of brucellosis of the bones or joints before serologic or cultural methods of diagnosis are used. The presence of any inflammatory disease of the bones, joints, or bursae should alert the physician to the possibility of brucellosis, particularly if the patient is a butcher or meat handler. Perhaps in no other orthopedic infection is a careful occupational history

so important. When cultural diagnosis is necessary, tissue and not just fluid should be obtained. Anemia, leukocytosis, or a high erythrocytic sedimentation rate occurred in a small percentage of the 36 patients encountered at the Mayo Clinic. In the 32 patients with culturally proved skeletal brucellosis the agglutination titers of serum often were low or absent. Brucella suis and Brucella abortus were the strains most commonly isolated from skeletal lesions. For patients with brucellosis of the bones and joints aggressive surgical treatment is usually indicated. The one exception is patients with brucellar spondylitis, which usually responds to rest and to use of braces or casts together with combined tetracycline-streptomycin therapy and which, in the authors' experience, has seldom required surgical intervention. However, in one of the patients with spondylitis studied, a large paravertebral abscess in the thoracic portion of the spinal column needed adequate drainage. Joints and bursae respond well to excision of the synovial tissue and therapy with combinations of antibiotics. Brucellar osteomyelitis requires wide drainage, saucerization, and care to prevent secondary pyogenic infection. Osteomyelitis is the hardest of all the lesions to treat successfully. Results of treatment with a combination of tetracycline and streptomycin were satisfactory in the cases treated by the authors.

-- Authors' summary

239 Staphylococcal Wound Infection in Surgical Unit. P. Rountree, et al. Lancet 2, 1 (July 2, 1960).

During 6 months, 217 consecutive surgical wounds in one department were examined for clinical and bacteriological evidence of infection. In 198 clean wounds the infection rate was 14%, while in the 19 dirty wounds the cross-infection rate was 68%; 35 wounds were infected with Staph. aureus. Of 171 wounds covered with a plastic seal at the end of operation, 12 (7%) were infected. In 5 of these, the patient on admission was already a carrier of the organism which infected his wound. In 27 wounds dressed with a gauze pad, and in 19 wounds with draining sinuses, the infection rates were 56% and 68% respectively. Investigations in operating-theaters revealed little evidence of infection during operations. Investigations in wards showed that patients and staff often acquired antibiotic-resistant staphylococci of phage-type 47 in their noses. These strains were isolated from the ward environment and were responsible for most of the wound infections.

-- J. Am. Med. Assn. Abst.

240 Bullous Emphysema. A Long-Term Study of Natural History and the Effects of Therapy. D. J. Stone, A. Schwartz and J. A. Feltman. Am. Rev. Resp. Dis. 82, 493 (1960).

The observations in this paper suggest that bullous emphysema is an acquired disease due to imperfect communication between the bronchioles and alveolar spaces. The relationships between this air-trapping mechanism and symptoms, signs and functional abnormalities are described. Because of the many individual variations, long-term observation is stressed, and this has revealed inconsistency between symptomatology and the extent of bullous emphysema. This has been related to the significant role that bronchitis plays in many of these patients, and a method for appraisal of this factor is suggested. Detailed serial pulmonary function studies reveal that ventilatory insufficiency and hyperventilation are the most consistent findings. A significant, although mild, defect in gas exchange may accompany large air-trapping bullae, but greater abnormalities are undoubtedly due to generalized bronchitis or obstructive emphysema. Serial observations in some patients suggest that medical therapy designed to control bronchial inflammation may be of definitive value. It has also proved to be of adjuvant value in surgically treated patients. The decision to perform resectional surgery on a patient with bullous emphysema must be carefully considered on the basis of numerous variables and theoretical factors.

-- Can. Med. Assn. J. Abstr.

241 Centrilobular Emphysema. J. P. Wyatt, V. W. Fischer and H. Sweet, Lab. Invest. 10, 159-177 (Jan.-Feb. 1961).

The purpose of this study was to determine the existence, morphogenesis, natural history, and heart-lung interrelationships of centrilobular emphysema as observed in a geographic area, where the clinical diagnosis of chronic bronchitis is made infrequently but the

autopsy label of emphysema is relatively common. Using the whole-lung parchment and the supplemental techniques of corrosion castings, post-mortem bronchoangiography, serial histologic examination of the diseased lungs, and ventricular-septal weight ratios of the associated heart specimens a more penetrating analysis of this distinctive form of emphysema has been possible. The subject is discussed under the following headings: materials and methods; macroanatomy of the secondary lobule of the lung; macroanatomy of centrilobular emphysema; microanatomy of centrilobular emphysema; and cardiovascular lesions. -- Authors' summary

SKIN DISEASES AND BURNS

242 The "Toxin-Antitoxin" Phenomenon in Burned and Injured Human Subjects. S. R. Rosenthal, J. B. Hartney and Wilma S. Spurrier. J. Am. Med. Assn. 174, 957-965 (Oct. 22, 1960).

The presence of toxins in the blood of burned or otherwise injured patients was indicated by the demonstration of cytotoxic effects on HeLa cells, cytolytic effects on red cells of other burned or injured patients, and precipitogens against serums from patients with healed burns. Such serums were shown to contain antitoxic-antibody-like substances by demonstrating their ability to neutralize the cytotoxic effect on HeLa cells and by demonstrating the presence of hemolysins and precipitins. In preliminary clinical trials and transfusion of blood or plasma from donors with healed burns to critically toxic burned or injured patients was followed by prompt improvement. Serums obtained from the recipients after such transfusions were no longer toxic to tissue cultures. The authors recommend further clinical trials of antisera of known titer from persons with healed burns. -- Authors' abst.

243 Dihydroxyacetone: A Suntan-Simulating Agent. H. I. Maibach and A. M. Kligman. Arch. Dermatol. 82, 505 (Oct. 1960).

A recent cosmetic development indicates the possibility of acquiring a suntan without exposure to the sun. Dihydroxyacetone, the active agent in these suntan-simulating proprietaries, is a triose sugar, which is an intermediate in the metabolism of carbohydrates in higher plants and animals. Dihydroxyacetone is a colorless substance which was found to combine with some mainly water-soluble component on or near the surface of the skin to bring about a brownish discoloration of the horny layer. This is a chemical staining reaction which does not involve any normal physiologic activity of the skin as synthesis of melanin, enzymic reactions, or microbial action. Some vitiligo patients found it a useful concealing agent. It did not act as a sun screen, nor were sensitization or toxicity noted. -- J. Am. Med. Assn. Abstr.

244 Cutaneous Porphyria in Turkey. R. Schmid. New Engl. J. Med. 263, 397 (Aug. 25, 1960).

About 5,000 cases of cutaneous porphyria have occurred in the Turkish provinces since 1955. The syndrome resembles porphyria cutanea tarda and consists of bullae and epidermolysis of the exposed skin, hyperpigmentation, hypertrichosis, hepatomegaly, and porphyrinuria. Epidemiologic studies incriminated hexachlorobenzene, a fungicide used treatment of seed wheat. The wheat had been used for human consumption instead of for planting purposes. Laboratory studies showed that 0.2% hexachlorobenzene, when fed to rats, produced urinary excretion of uroporphyrin and coproporphyrin. -- J. Occ. Med. Abstr.

245 Extensive Dermatitis due to Warfarin Sodium (Coumadin). C. W. Adams and B. J. Pass. Circulation 22, 917 (1960).

This report describes a case of severe dermatitis, involving the skin and mucous membranes which followed the use of Warfarin sodium (Coumadin). The lesions disappeared with corticosteroid therapy but recurr d upon challenge with Warfarin sodium. Upon elimination of this drug, the skin and oral lesions disappeared. The patient had no allergic manifestations following the administration of dihydroxycoumarin. -- Can. Med. Assn. J. Abstr.

246 An Unusual Occurrence of Sporotrichosis. H. D. Garrett and J. B. Robbins. Arch. Dermatol. 82, 570 (Oct. 1960).

Several cases of occupational sporotrichosis occurred in a group of Mexicans from injuries received while unpacking pottery. The pottery had been packed in a native grass contaminated with Sporotrichum schenckii. -- J. Occ. Med. Abstr.

CHEMICAL HAZARDS

247 Poisoning by Nitrous Gases. A. Propst. Wien. med. Wochschr. 110, 591-596 (July 9, 1960). German.

Poisoning by oxides of nitrogen—NO_2, N_2O_4, NO and N_2O_3—and also by the formation of nitrous and nitric acids may be a risk to workers in many industries. Numerous fatalities in industrial workers have been reported in the literature. Opinions on the toxicology of these substances are not in entire accord. Some observers consider that the chief effect is on the pulmonary system through the local formation of nitric acid which causes pulmonary edema, but others take the view that a general systemic poisoning is brought about by the formation of nitrite. This paper contains a detailed report of a man aged 45 years who was engaged at a steel works in cleaning out a drainage pit which contained some steel plate, with nitric acid and additions of salt and sulfuric acid. After the end of his shift he was taken ill with giddiness and some difficulty of breathing and cough. His condition deteriorated rapidly and he died after 3 days from pulmonary edema. There is a full account of the post-mortem findings, including photographs of the microscopic appearances of the lung and the results of spectrophotometric examination of blood taken from the heart. The chief toxic changes were found to be those of local pulmonary irritation caused by the formation of nitric acid. Evidence of systemic poisoning, however, was found in the general dilatation of blood vessels, blood stasis and fatty changes in the liver which resulted from the formation of methymoglobin, nitrogen oxide hemoglobin and nitrite demonstrated by spectrophotometry. -- Bull. Hyg.

248 Bone-Marrow Activity and Erythrocyte Destruction in Chronic Cadmium Poisoning. Studies with Fe-59 on Rabbits. M. Berlin and L. Friberg. Arch. Environmental Health 1, 478-488 (Dec. 1960).

This investigation showed that accelerated destruction of the erythrocytes and deficiency of iron in the bone-marrow contribute to the anemia of cadmium poisoning in addition to the earlier demonstrated increase in the volume of blood plasma. No evidence was found for diminished bone-marrow activity with respect to erythropoiesis. Some of the observations suggested increased bone-marrow activity. The reduced life span of the erythrocytes was not in essential degree attributable to toxic influence on erythropoiesis. The authors' studies did not elucidate whether the iron deficiency in the bone-marrow is caused by increased utilization of iron as a result of the intensified erythrocyte destruction and consequent loss of iron or by disturbance of the mechanism for transportation of iron. It was demonstrated, however, that such disturbance in iron transportation was not situated between the blood and the bone marrow. -- Authors' conclusions

249 The Use of Dimercaprol (BAL) in the Treatment of Cadmium Oxide Fume Poisoning. H. N. MacFarland. Arch. Environmental Health 1, 487-496 (Dec. 1960).

Dosage-mortality data have been obtained from 200 g. Wistar rats subjected to a single, 15-minute exposure to arc-produced cadmium oxide fume. Analysis of the results by the probit technique yielded an estimate for the L(Ct)50 of 666 mg. min./cu.m., with confidence limits of 533 and 764 at the 95% level of probability. For the L(Ct)95, an estimate of 1088 mg. min./cu.m. was obtained, with limits of 896 and 2,265. The efficacy of dimercaprol in reducing mortality and in prolonging survival time of rats exposed to 3.1 to 4.5 times the L(Ct)95 of cadmium oxide fume has been examined in 3 factorially-designed experiments. Nearly complete protection against the lethal effect was obtained with a daily dose of approximately 100 mg. of dimercaprol administered subcutaneously in divided doses. Two factors, amount of dimercaprol per injection and frequency of injections per day, were varied in these experiments; however, the protection afforded was found to depend on the total daily dose of dimercaprol. These results have been discussed along with other relevant published data, and it is concluded that a reconsideration of the clinical use of dimercaprol in acute cadmium oxide fume intoxication is warranted. -- Author's summary

250 Effect on Environmental Temperature and Humidity on Lead Poisoning in Animals. A. M. Baetjer, S. N. D. Joardar and W. A. McQuary. Arch. Environmental Health 1, 463-477 (Dec. 1960).

Mice exposed to an environmental temperature of 95°F when injected with lead intraperitoneally or intravenously began to die sooner, had a higher mortality and shorter average survival time than mice at 72°F. This effect of high temperature on acute lead poisoning was more marked when the exposure followed immediately after the injection of lead than when exposure to heat also preceded the lead poisoning. The results were similar whether a high or low humidity accompanied the high temperature. Prolonged exposure to heat preceding the injection of lead did not reduce the harmful effect of heat exposure. Removal from heat at nights alleviated the effect to some extent. Exposure of rats to high temperature similarly increased their mortality following the intravenous injection of lead. Mice exposed to an environmental temperature of 60°F had a higher mortality and longer average survival time than those exposed to 72°F temperature when injected intraperitoneally with lead, but no significant differences were found when the lead was injected intravenously. Mice with chronic lead poisoning, produced by repeated injections of lead, began to die sooner and had a higher mortality when exposed to a high temperature following cessation of lead injections. Severe dehydration produced by restricting water consumption increased the mortality of mice from acute lead poisoning at all temperatures. The effect was much more marked when the lead was injected intraperitoneally than when injected intravenously. Weight loss and decrease in activity which occur upon exposure of mice to heat, when produced at normal temperature by food restriction and isolation, did not increase their susceptibility to lead. -- Cond. from authors' conclusions

251 Determination of Lead in Paint Scrapings as an Aid in the Control of Lead Paint Poisoning in Young Children. E. Kaplan and R. S. Shaull. Am. J. Public Health 51, 65-69 (Jan. 1961).

In order to prevent lead poisoning in children caused by ingesting paint from surfaces coated with paint containing lead, public health authorities are requiring warning labels on paint with lead in excess of 1%, they are prohibiting the interior painting of dwelling units with such paint and they are ordering the removal of paint containing lead where it presents a hazard to young children. A simple and inexpensive procedure is described for rapidly screening paint scrapings at the 1% level to determine compliance with these regulations. -- Authors' abst.

252 Parkinsonism due to Manganese Poisoning. D. L. Ovedoff and F. Reinhold. Med. Proc. (Johannesburg) 6, 195-197 (May 7, 1960).

The history and neurological findings described in 5 patients show that parkinsonism developed after relatively short exposures, from 6 to 24 months, to manganese fumes in a factory in Johannesburg where ferromanganese steel is produced. Apparently the oldest was

a European aged 43. His neurological symptoms had appeared suddenly when he had a severe cough, and the possibility of manganese pneumonitis is mentioned. When seen 9 months after exposure had ceased, the neurological disease appeared static. Of 5 Africans, 2 had signs of peripheral neuritis, not previously described in manganese poisoning; no other etiological factor was found, though there was a possible history of alcoholism in one. The characteristic features were excessive tiredness and sleepiness, muscular pains, impairment of speech and difficulty in swallowing, and abnormal gait and extreme facial immobility. Several of the features are uncommon in postencephalitic and arteriosclerotic parkinsonism, though typical of manganese encephalopathy, and some are usually only seen, in the degree described, in the final stages of extra-pyramidal disease, and not in relatively early cases such as these.
-- Bull. Hyg.

253 The Response of Guinea Pigs to Inhalations of Formaldehyde and Formic Acid Alone and with Sodium Chloride Aerosol. Mary O. Amdur. Intern. J. Air Poll. 3, 201-220 (Oct. 1960).

One hour exposures of guinea pigs to formaldehyde or formic acid produced an increase in resistance and a decrease in compliance which were statistically significant at concentrations as low as 0.3 ppm. A decrease in respiration rate and minute volume also occurred, but these factors did not change significantly until concentrations above 10 ppm were used. An increase in respiratory work was observed, the greater proportion of the increase being in the resistive component. These changes became statistically significant at 1 to 3 ppm. Evaluated by these criteria, formic acid is a more potent respiratory irritant than formaldehyde. The resistance values returned to pre-exposure control values by the end of an hour after exposure except at the highest concentration used (40 to 50 ppm). When the protective effect of the upper airway was by-passed with a tracheal cannula, the response to a given concentration of formaldehyde was increased. The resistance change was again reversible in an hour after the exposure ended. The response to formaldehyde was potentiated by the presence of an aerosol of sub-micron particle size sodium chloride which was itself inert. The response to this combination was greater than the response to the gas alone breathed through a tracheal cannula. A tracheal cannula used with the gas-aerosol combination produced an increase exactly accounted for on the basis of the increased response to that concentration of gas alone. The submicron sized aerosol would not be removed by the upper respiratory tract, hence, the potentiation due to the aerosol entity would be the same in normal and tracheotomized animals. Formaldehyde was used with 3 different aerosol concentrations, 3, 10, and 30 mg. cu.m. The potentiation increased with increasing aerosol concentration, but attained a limiting value at each aerosol level once a critical gas concentration was reached. The response to formic acid during exposure was not potentiated by the aerosol. -- Cond. from author's abst.

254 Myocarditis Produced by Allylamines, Experimental. R. J. Guzman, et al. Arch. Environmental Health 2, 62-73 (Jan. 1961).

The authors have demonstrated, for the first time, consistent production of myocardial lesions in rats and rabbits by exposure to the vapors of organic compounds. The effective compounds were monoallyl, diallyl, and triallyl amines, and bis(2-ethylhexyl)allylamine. The lesions had both a vascular and a muscular component, the former occurring earlier and giving way to myocardial degeneration. In the experience of the authors these lesions were confined to the vessels of the myocardium and not found in the aorta or elsewhere. These lesions could be produced by relatively short-term exposure to low concentrations, but there was definite individual as well as species and routine variation. The lesions were accentuated by physiologic or other stress. So far, the effect has been shown only with allylamines and not with other closely related amine analogues or allyl compounds. Electrocardiographic abnormalities, characterized by elevation of the ST segment, occurred when the lesions were extensive enough; transaminase levels were not elevated sufficiently to be of diagnostic value. Good industrial hygiene control should be exercised in order to prevent undue exposure. -- Authors' summary

255 Spectrophotometric Determination of Cyanamide. D. A. Buyski and V. Downing. Anal. Chem. 32, 1798-1800 (Dec. 1960).

Cyanamide in blood, urine, and soil is determined by spectrophotometric procedure. The sample is reacted with pentacyanoammineferrate in a carbonate buffer at pH 10.5. The color produced is measured at 530 millimicrons. The usual impurities and additives found in cyanamide preparations do not interfere. -- AC Briefs

256 Toxic Encephalopathy Apparently Related to the Use of an Insect Repellent. Joyce Gryboski, D. Weinstein and N. K. Ordway. New Engl. J. Med. 264, 289-291 (Feb. 9, 1961).

A case of encephalopathy is reported in a 3-year-old girl that may have been brought about by an agent in an insect repellent. Signs were disorientation, staggering gait, slurred speech and episodes consisting of stiffening into a sitting position, crying out, extending the extremities, flexing the fingers and dorsiflexing the toes. Therapy consisted of intravenous infusion of fluids and anticonvulsant medication. The assumed toxic agent was N-N-diethyl-m-toluamide, which, in considerably higher doses, had produced similar signs and death in laboratory animals. -- Authors' summary

257 Some Effects of Epoxy Compounds on the Blood. J. K. Kodama, et al. Arch. Environmental Health 2, 50-61 (Jan. 1961).

The less complicated polyfunctional epoxides, and monofunctional epoxides with auxiliary active groups, were shown to be capable of producing deleterious effects on the hemopoietic system. Erythrocytes were sharply decreased by 5 of the 13 compounds, one of which did not alter the leukocyte picture or decrease the number of nucleated marrow cells. Six compounds decreased the leukocyte count significantly, and 4 decreased the number of nucleated cells in the femoral marrow. It was possible for a compound to decrease the number of nucleated marrow cells without decreasing the number of circulating leukocytes and vice versa, under the conditions of the experiment. The authors recommend that the radiomimetic effects of these epoxides be considered when assessing the hazards involved in their application and handling. -- Authors' summary

INDUSTRIAL DUSTS

258 Field Evaluation of Ragweed Pollen Samplers. E. C. Ogden and S. Raynor. J. Allergy 31, 307-316 (July-Aug. 1960).

The authors' experiments have shown that pollen capture by the standard Durham sampler is determined by several factors, in addition to the concentration of pollen in the air. Aerodynamic factors are responsible for the greater collecting ability of the slide when its long axis is placed parallel to the air flow. Orientation of the slide with respect to wind direction may result in a 5 to 1 difference in catch between adjacent slides. It was also found that the amount of pollen captured is a function of the amount of air passing over the slide as well as the concentration of pollen in the air. Thus, an increase of 3 to 4 mph in wind speed may give more than 50% increase in the pollen captured. Since wind speed normally increases with height, elevation of the sampler above the ground determines the wind speed to which the slide is exposed and effects the count. Tests of a filter sampler showed that this device was also affected by wind speed but in an opposite manner, since efficiency in capturing particles in the pollen size range decreases with increasing wind speed. Improvements in the standard sampling technique might include vane orientation of the slide sampler and measurement of the air flow which could be used to correct the count, or the use of round or square slides with similar correction of wind speed. -- Public Health Engr. Abstr.

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259 Industrial Gas Cleaning. N. Pilpel. Brit. Chem. Eng. 5, 542-550 (Aug. 1960).

There are 5 principal methods which are employed on an industrial scale for removing small particles and liquid droplets from gases and vapors. These are filtration, electrostatic precipitation, inertial separation, wet scrubbing and agglomeration. The purpose of the present article is to review recent developments in the theory underlying these methods and to describe equipment which is in current use in industry for the treatment of smokes, dusts and mists. -- Public Health Eng. Abstr.

260 Experimental Byssinosis. P. Tuffnell. Brit. J. Ind. Med. 17, 307-309 (Oct. 1960).

The symptoms of byssinosis were produced experimentally in 1 of 3 cotton-mill workers with pronounced byssinosis, by a dust prepared from the leaves of cotton plants. Dusts of calcium carbonate, bacteria, and fungi did not reproduce the symptoms. Two mill cases of byssinosis and 2 cases of chronic bronchitis did not react specifically to any of these dusts. -- Author's Abst.

261 Experimental Bagassosis. (2) Enzymes of Lung In Vitro. V. N. Singh, et al. Enzymologia 21, 350-355 (1960).

The present investigation on the effects of bagasse (sugar cane fiber) dust on the enzyme systems of guinea pigs in vitro is meant to form a background against which the effect of bagassosis on the enzymatic pattern of the lung in vivo could be reviewed. Using a Warburg respirometer and freshly-prepared guinea pig lung, studies were made of the effect of bagasse dust on the respiratory quotient and on the activity of malic dehydrogenase, lactic dehydrogenase, cytochrome oxidase, fumarase, adenosine, tryphosphatase, and transaminase. There was no noticeable change in the respiratory quotient or the activity of the first 4 enzymes but there was an appreciable enhancement of the latter 2 enzymes in the presence of 1% bagasse dust. In the case of succinic dehydrogenase the effect of the whole bagasse, as well as the water-soluble extract, was studied. The former inhibited but the latter did not have any effect at all on the activity of the enzyme. -- APCA Abstr.

262 The Relationship of Byssinosis to the Bacteria and Fungi in the Air of Textile Mills. P. Tuffnell. Brit. J. Ind. Med. 17, 304-306 (Oct. 1960).

The principal causative agent of byssinosis lies in the dust of cotton mills. This dust contains bacteria and fungi. An attempt has been made to determine whether any association could be established between the numbers of viable bacteria and fungi in the air of 2 cotton and 2 jute mills, and the prevalence of byssinosis. No association was found except between the numbers of live organisms of B. pumilus and B. Subtilis, and the occurrence of byssinosis. This association does not establish a causal relationship, but it is suggested that an attempt should be made to produce typical symptoms in byssinotic subjects by means of organisms of the genus Bacillus. -- Author's abst.

263 Dust Diseases in Dundee Textile Workers. An Investigation into Chronic Respiratory Disease in Jute and Flax Industries. A. Mair, D. H. Smith, W. A. Wilson and W. Lockhart. Brit. J. Ind. Med. 17, 272-278 (Oct. 1960).

A survey of respiratory symptoms and function was carried out in Dundee among 123 men and women in the jute industry and 242 in the flax industry. The selection of workers was biased in favor of those working in the dustier departments as judged by eye and those in the older age groups. A group of 72 men in a heavy engineering firm were also selected as controls for comparison. Chronic bronchitis, as defined by Ogilvie and Newell (1957), was recorded in 27% of those interviewed, whose average age was 49. Byssinosis of various grades was recorded in 30% of all working in flax; of these 35 had cough alone worse on Monday, 34 had other respiratory symptoms worse on Monday and in only 4 persons did the exacerbation persist long

in the week. In spite of the occurrence of byssinosis, chronic bronchitis was no more prevalent among flax workers than among the others, the average ventilatory function was no worse, and radiographs of the chest revealed no differences. The characteristic fall in expiratory flow rate during the course of exposure to flax dust on Mondays is similar to that found in cotton workers, and is absent in jute workers and in flax workers not admitting to symptoms of byssinosis. -- Authors' abst.

264 The Relation Between Lung Dust and Lung Pathology in Pneumoconiosis. G. Nagelschmidt. Brit. J. Ind. Med. 17, 247-259 (Oct. 1960).

Methods of isolation and analysis of dust from pneumoconiotic lungs are reviewed, and the results of lung dust analyses for different forms of pneumoconiosis are presented. A tentative classification separates beryllium, aluminum, abrasive fume, and asbestos, which cause interstitial or disseminated fibrosis from quartz, coal, hematite, talc, kaolin, and other dusts, which cause a nodular or local fibrosis which may change to forms with massive lesions. The data suggest that in the first, but not in the second, group the dusts are relatively soluble; only in the second group do amounts of dust and severity of fibrosis go parallel for a given form of pneumoconiosis. In classical silicosis the quartz percentage is higher, and the amount of total dust much lower than in coal miners' pneumoconiosis. Mixed forms of both groups occur, for instance, in diatomite workers. The need for more research, especially in the first group, is pointed out. -- Author's abst.

265 Connective Tissue in Experimental Silicosis and Anthracosis. Histochemical Features of Development. A. I. Strukov and N. T. Raikhlin. Arch. Pathol. 71, 142-150 (Feb. 1961).

The development of the connective tissue in experimental silicosis commences with the appearance at the sites of silicon deposition of non-differentiated fibroblasts rich with ribonucleic acid, which is rapidly transformed into fibrocytes. Apparently, in connection with the features specific to the mucopolysaccharides—component of the complex procollagen—the surface of the collagenous fiber has weak bonds with the rest of the fiber. In the silicious connective tissue there occurs formation of incomplete collagenous fibers, as a result of which they undergo considerable readjustment and become disarranged. Accumulation in the tissue of products of the collagen complex and their subsequent combination are conducive to conditions favorable for the appearance of hyalinosis. Necrosis of silicious nodules is closely connected with poorly formed collagenous fibers, which are produced under pathologic conditions. During experimental anthracosis the development of sclerosis proceeds at a low rate and never reaches the degree attained in silicosis. The manifestations of hyalinosis are also pronounced to a lesser extent, while necrosis of the fibrous-dust foci is of very rare occurrence. Of major importance in the mechanism of collagenous fiber production is the acellular type of sclerosis. Procollagen (the surface phase of collagenous fiber) is united more strongly with the remaining portion of the fiber (collastromin) and is not removed by collagenase. The disclosed features peculiar to the connective tissue in experimental silicosis and anthracosis are of importance for the classification of certain aspects of pathogenesis in pneumoconiosis.
-- Authors' conclusions

266 Prevention of "Silica Shock" by Aluminum. G. W. H. Schepers and A. B. Delahant. Arch. Environmental Health 2, 9-15 (Jan. 1961).

The intracardiac injection of 40 mg. of particulate quartz causes splanchnic hyperemia and death in guinea pigs. This silica "shock" can be prevented by adding from 4 to 26 mg. of colloidal aluminum hydroxide to the suspension. When precipitated aluminum hydrate is added to the silicon dioxide the splanchnic vascular reaction is intensified. Metallic aluminum particulates, oxidized or unoxidized, are inadequate antidotes against silica "shock" though capable of preventing silicosis when inhaled as aerosols. Colloidal aluminum hydroxide is nontoxic on intracardiac injection within a therapeutically effective dose range. This fact, coupled with its proved antidotal action against the circulatory disturbance induced by silicon dioxide, suggests that aluminum hydroxide may mitigate disabling bronchiolar spasm and pulmonary hypertension in silicotic patients. -- Authors' summary

267 The Classification of Chest Radiographs for Coal Workers' Pneumoconiosis. A Study of the Performance of Two Readers Over a Period of Six Years. J. R. Ashford. Brit. J. Ind. Med. 17, 293-303 (Oct. 1960).

This paper is concerned with the performance over the past 6 years of the 2 doctors responsible for the classification of chest radiographs obtained by the National Coal Board's Pneumoconiosis Field Research. A brief description is given of the categories of pneumoconiosis used in the Research and of the procedures adopted to decide the final or "definitive" classification. The readings obtained are then considered in detail and 3 main points emerge from the analysis. First, it is shown that there have been marked systematic fluctuations in the reading levels of these 2 very experienced observers. In spite of these individual variations it is found that the standards applied on the definitive readings, which are based on the joint discussion by the 2 doctors of films on which their individual readings are inconsistent, remain remarkably constant over a period of several years. The third main feature of the analysis is the considerable differences in the magnitude of the reading errors between the various categories of pneumoconiosis. It is concluded that, although the existing procedures provide a satisfactory way of estimating the prevalence of pneumoconiosis, it would be desirable to increase the number of film readers. The beneficial effect of the system whereby a running check is kept on film reading standards is also established. -- Author's abst.

268 Emphysema, Soot, and Pulmonary Circulation. Macroscopic Studies of Aging Lungs. C. P. Oderr. J. Am. Med. Assn. 172, 1991-1998 (Apr. 30, 1960).

Two hundred lungs, obtained from persons dying of diseases other than pulmonary tuberculosis, were fixed in the inflated state to permit study of the relation between emphysema and deposits of soot. The evidence showed that chronic emphysema usually develops first in small areas of trapped parenchymal soot deposits; it is manifested by abnormal fenestrations in the interalveolar septums and by increased diameter of the alveolar ducts. The emphysema accompanying deposits of soot can be explained as resulting from tissue defects and disarrayed mechanical forces. Precapillary vessels are found protruding into the air spaces of the alveolar duct level, providing a possible mechanism for correlation between aerodynamics and hydrodynamics in the lung parenchyma. The morphological basis for an extensive semishunt mechanism is demonstrated in the periphery of each lobe. -- APCA Abstr.

269 Radiological Diagnosis in Asbestosis. R. Williams and P. Hugh-Jones. Thorax (London) 15, 103 (June 1960).

The authors studied the lung function in 40 patients at the Royal Free Hospital, London, who had been exposed to asbestos dust in their work for varying periods of time. Of these, asbestosis had been certified by the pneumoconiosis medical boards in 21; 10 patients with a prolonged exposure did not have definite roentgenographic signs of asbestosis; in the remaining 9 patients the diagnosis of asbestosis was doubtful. The changes of pulmonary function observed in the patients with asbestosis were those common to patients with other interstitial fibroses, and consisted of a lowered diffusing capacity together with a reduced inspiratory capacity, hyperventilation (often accompanied by arterial desaturation) on exertion, with no evidence of air-flow obstruction except in patients in whom asbestosis was complicated by asthma or emphysema. Many patients also showed inequality of ventilation and ventilation-perfusion ratio. These functional changes were related to an independent grading of physical signs and roentgenographic appearances. Changes in lung function, specific for an interstitial fibrosis, often precede definite changes in the chest roentgenogram, so that finding them in patients with a history of exposure to asbestos is suggestive evidence of asbestosis whatever the roentgenographic appearances may be. -- J. Am. Med. Assn. Abstr.

470 Asbestosis and Abdominal Neoplasms. E. E. Keal. Lancet 2, 1211-(1960).

In 1953, an impression was formed at the London Hospital that women suffering from pulmonary asbestosis had ovarian neoplasms more often than other women. On the basis of this suspicion and because of the occurrence of other cases, the hospital records since 1948 were investigated. During that period, 23 women and 17 men were admitted with a diagnosis of asbestosis. In this series, there were 30 deaths (15 men and 15 women). Of these, 14 died with lung cancer (10 men and 4 women). This high incidence in men is partly due to selection, but this does not apply to the women, who were all non-smokers. Death occurred in one man with peritoneal cancer and in 9 women with ovarian or peritoneal cancer. This appeared to be more than a chance association, and spread from undiagnosed lung cancer seemed unlikely. At least 4 of the tumors were not of ovarian origin. Some evidence of hematogenous spread of asbestos fibers was adduced and it was suggested that a combination of mechanical and chemical factors may determine the peritoneum as the site of inflammatory and subsequent neoplastic change. No single satisfactory explanation for these cases could be drawn from the available material though they appeared to form a clinical entity of statistical significance.
-- Can. Med. Assn. J. Absts.

471 Occupational Medical Investigation in Cement Works. Jenny M. Battig, et al. Schweiz. med. Wochschr. 90, 705-709 (June 25, 1960). German.

This is the first systematic investigation in Switzerland into the possibility of respiratory complaints arising from the inhalation of cement dust. No free silica is present in Swiss cement, so silicosis is not a risk, a fact confirmed by the radiological examination of some of the workers. In all, 488 employees at 3 factories were studied. The absentee rate at one of the factories was much higher than at others; the percentage of men complaining of cough and of those with sputum was also higher in this plant. The cause of this might be partly due to social factors, epidemics, etc. A study of smoking habits shows that exposure to cement dust does not increase coughing in smokers. It is suggested that those who are resistant to smoker's cough are also resistant to dust. Non-smokers show a surprisingly high proportion with chronic cough as compared with figures given by another author. Perhaps a better comparison would have been with a non-occupational group studied by the authors themselves. However, it is concluded that this shows that cement dust is irritating to the respiratory passages. Physical signs found did not lead to any definite conclusion. Vital capacity was not influenced by the length of dust exposure. In a few workers the maximum expiratory force was reduced. An attempt was made to relate the findings to the intensity of exposure by dividing the workers into 3 groups. The 2 groups most exposed to dust showed a tendency to increased pathological signs, but the difference was not statistically significant. -- Bull. Hyg.

472 A Study of the Physiological Effects of Carbon Black. (3) Adsorption and Elution Potentials; Subcutaneous Injections. C. A. Nau, J. Neal and V. A. Steinbridge. Arch. Environmental Health 1, 512-533 (Dec. 1960).

Neither blood plasma nor gastric juice elutes any significant adsorbed component when a channel black is suspended in either medium for as long as 7 days. Neither blood plasma nor gastric juice elutes any significant adsorbed component when a furnace black is suspended in either medium for as long as 7 days. Channel black "binds" benzpyrene adsorbed "artificially" so firmly that it cannot be removed "in toto" by benzene extraction. No significant extraction of either channel or furnace carbon black was accomplished with gastric juice to which 10% cooking oil was added when contact was maintained for 7 days. Subcutaneous or intraperitoneal injection in mice of channel or furnace carbon black leads to no significant changes from the normal. Benzene extractives of furnace blacks when injected in oil into mice lead to tumor formation. Carbon blacks, channel or furnace, can absorb and bind known carcinogens so effectively that no tumors are produced when the adsorbed material is injected subcutaneously. Tricaprylin when injected subcutaneously in mice may cause tumor formation.
-- Authors' conclusions

PHYSICAL ASPECTS OF THE ENVIRONMENT

273 Symptomatic Pulmonary Disease in Arc Welders. E. Friede and H. O. Bachow. Ann. Internal Med. 54, 121-126 (Jan. 1961).

A case of symptomatic lung disease in arc welders has been discussed. The clinical picture is that of pulmonary fibrosis and advanced emphysema, with polycythemia, secondary features of pulmonary hypertension, and right heart failure. There is evidence that the explanation for the lung changes is excessive and prolonged exposure to fumes containing a combination of iron and *free silica*. -- Authors' summary

274 Old Age and Hypoxia. N. N. Sirotinin. Klin. Med. No. 8, 72 (1960). Russian.

Certain observations suggest important similarities between mental and even physical changes occurring in old age and the changes in people who are exposed to high altitudes or to hypoxia of other origin. The author suggests that periodic living in high altitudes is one explanation for the longevity of some shepherds in mountainous regions. He points to the unusual energy and endurance shown by Swiss mountain guides, 75 to 78 years old, who are *still* carrying out their work. Acclimatization to high altitudes may contribute to longevity. Recently the author received a communication from the laboratory of E. M. Krebs, where it was found that rats exposed to long periods of hypoxia are known to live longer than control rats. -- Can. Med. Assn. J. Abstr.

275 Effect of Geographical Origin on Performance in Heat. C. P. Yaglou. Arch. Environmental Health 2, 1-8 (Jan. 1961).

A comparison of the performance of young, southern Floridians with that of a similar group of New Englanders, walking in the humid heat of *Homestead, Florida*, indicated that the Southerners had a more efficient heat regulating system, which enabled them to perform the standard exercises with distinctly less sweating, and a smaller rise of body temperature and heart rate. The Southerners required a shorter period for physical conditioning in the heat, and lost acclimatization at a slower rate than the Northerners during periods of cool, rainy weather. The *superior performance of the Southerners* is ascribed to their long-term acclimatization, and their knowledge of living and working in their accustomed warm climate. It would seem that in selecting personnel for duty in hot areas, the geographical origin of the individual should be given a high priority, possibly next to that of physical fitness. -- Author's summary

276 Ecological Factors Affecting Efficiency and Health in Warships. F. P. Ellis. Brit. J. Ind. Med. 17, 318-326 (Oct. 1960).

The environment of those who live and work in warships is closely related to the way the ships are built and employed. In stating the requirements for the atmosphere between decks the emphasis has swung during the past 50 years from the need for controlling the chemical constituents to the control of the factors which comprise the thermal environment, and now, with the advent of the nuclear-powered submarine, to the need for achieving, as nearly as possible, complete physical, chemical, and microbiological control. Between 1944 and 1953 the thermal factors between decks were investigated in a series of studies carried out in H.M. *Ships*. The average effective temperatures on the mess decks and in the work places of 11 ships in the Eastern Fleet in 1944 exceeded 84°F (28.9°C). In compartments where radiant heat was an added factor the average corrected effective temperature levels were 1° or 2°F (0.55 to 1.1°C) higher than the corresponding effective temperatures. The effects of climatic

conditions on naval personnel were investigated by psychological studies to determine the levels of warmth at which performance deteriorated; by physiological experiments to show the levels of warmth at which the collapse of men working at different work rates might be expected; by comfort surveys in ships and on shore to determine the levels of warmth at which the majority enjoyed optimum comfort; and by relating the monthly incidence of the common causes of ill-health to the average monthly upper-deck temperature as recorded at noon each day in order to determine the temperature level above which sickness increased. It was concluded that the upper desirable level of warmth to consider when designing ships for hot climates was an effective temperature of 78°F (25.5°C).

-- Cond. from author's abst.

277 The Tonometer in the Early Diagnosis of Glaucoma. S. M. Drance. Can. Med. Assn. J. 84, 224-225 (Jan. 28, 1961).

Routine use of the Schiotz tonometer in people over 40 years of age will bring to light very early cases of glaucoma and will result in a better prognosis. As an aid to making a correct interpretation of the tonometric reading the common causes of error in interpretation have been outlined. Two of these arise from the nature of the disease and one from the method of tonometry itself. A raised intraocular pressure almost always means glaucoma. A normal reading, though reassuring, does not exclude glaucoma. -- Author's summary

RADIOACTIVITY AND X-RADIATION

274 A Study of Two-Stage Air Samplers Designed to Simulate the Upper and Lower Respiratory Tract. E. C. Hyatt, H. F. Schulte, C. R. Jensen, R. N. Mitchell and G. H. Ferran. LA-2440. Los Alamos Scientific Lab., New Mexico. 50 pp. (June 1960). Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D.C.

Industrial hygienists have recognized for many years that there is a need for a suitable air-sampling device that could, in effect, be used to simulate man as a dust sampler. Such a device should be capable of distinguishing between the fraction of inhaled dust which would be retained in the upper respiratory tract and that in the alveoli. This study was made to determine the effectiveness of sturdy, low-volume two-stage air samplers suitable for environmental air sampling. Four two-stage air samplers utilizing inertial collection were studied with uranium aerosols. The standard against which the samplers were evaluated was the selective action of the respiratory system in dealing with dust particles of different aerodynamic sizes. The first stage of the two-stage sampler should be 90 to 100% efficient in the range 5 to 10 microns and approximately zero at 1 micron. Detailed results are presented, giving particle-size data obtained on each fraction of the two-stage samplers studied and the efficiency of the first stage in the range 0 to 10 microns. -- Nuclear Sci. Abstr.

275 Reduction of Fetal Irradiation in Pelvimetry. T. A. Kendig. Radiology 75, 608-611 (Oct. 1960).

It is important to recognize the growing concern as to the possible significance of general body irradiation of the fetus in the course of pelvimetry. To reduce this appreciably there are only 2 really satisfactory alternatives, either to eliminate the procedure entirely or to refine the technique so that the fetus obtains only a fraction of the exposure incident to the more conventional method of pelvimetry. This latter object was achieved to a highly satisfactory degree by precision coning, precision centering, masking the area where the fetal head lies, and protecting the remainder of the fetus by a leaded apron placed over the maternal abdomen. -- Nuclear Sci. Abstr.

280 A Prospective Study of the Leukemia Mortality of Children Exposed to Ante-Natal Diagnostic Radiography. A Preliminary Report. W. M. G. Brown and R. Doll. Proc. Roy. Soc. Med. 53, 761-762 (Sept. 1960).

A survey was made of the mortality from leukemia of children exposed in utero to diagnostic x-rays. It was concluded that if a leukemogenic risk is incurred by prenatal x-ray exposure, the risk is very small. -- Nuclear Sci. Abstr.

281 Practical Application of Radioactive Metals. L. E. Farr, et al. Bull. N. Y. Acad. Med. 36, 510-537 (Aug. 1960).

The transcript of a panel discussion on the practical applications of radioactive metals in medicine is given. The effects of radioisotopes on tissues; their therapeutic usefulness; some specific approaches used in isotope therapy; the properties that make isotopes desirable or undesirable; the control and care of malignant diseases through the use of radioisotopes; and the development of methods leading to more precise localization of radioisotopes for therapeutic purposes and resulting in a better understanding of the effects of radioisotopes should they contaminate body structures were discussed. -- Nuclear Sci. Abstr.

282 Urine Radiography of Excreted Iodide, A New Renal Function Test. B. P. Grant and R. Wi[illegible]. J. Am. Med. Assn. 174, 1304-1307 (Nov. 1960).

A new technique, excretory urine radiography, for estimating organic iodide excretion after its intravenous injection is simple and inexpensive. Its accuracy was proved by comparison with chemical and isotopic measurements of iodide excretion. It facilitates measurement of glomerular filtration. It adds to excretory urography an important needed feature or may be employed as a separate renal function test. The range of normal values is provisionally considered as those above 20% excretion of diatrizoate in 30 minutes. -- Nuclear Sci. Abstr.

283 An Industrial Gamma Irradiator for Medical Supplies. J. H. Frankfort, S. Haram and S. Wallach. NYO-9433. Associated Nucleonics, Inc., Garden City, N.Y. 139 pp. (Feb. 19, 1960).

Criteria were developed for the gamma sterilization of medical supplies and pharmaceuticals. Preliminary design data and cost figures are presented for a gamma irradiator. Both Co-60 and Co-137 are considered as gamma sources. Photographs of a model of a proposed irradiator and diagrammatic sketches of design details are included. -- Nuclear Sci. Abstr.

284 An Experimental Gamma Irradiator for Hospital Sterilization. J. H. Frankfort, S. Haram and S. Wallach. NYO-9432. Associated Nucleonics, Inc., Garden City, N.Y. 94 pp. (March 7, 1960).

Preliminary design data are presented for a gamma irradiator for use as an experimental hospital sterilizer. A photograph of a scale model and schematic sketches of design details are included. Initial-cost and operating data are considered for both Co-60 and Co-137 sources. Among the materials particularly suited to gamma sterilization are bone transplants, rubber gloves, dressing packs, petrolatum gauze, and mattresses. -- Nuclear Sci. Abstr.

285 Environmental Radioactivity Prior to Nuclear Power Plant Operation. J. V. Nehemias, G. H. Whipple and N. C. Kothary. J. Am. Water Works Assn. 52, 1291-1302 (Oct. 1960).

When any major nuclear production facility is planned, the possibility that radioactive materials may be inadvertently released into the environment must be considered. Evaluation of the impact of plant operation on the levels of radioactivity in the environment implies know-

ledge of radioactivity levels present before operation begins. A pre-operational survey of environmental radioactivity has been in progress for 2 years in the vicinity of the power reactor being constructed in Southeastern Michigan by the Power Reactor Development Company. Environmental radioactivity has demonstrated a general increase throughout 1958, continuing into the spring of 1959, and a general decrease thereafter throughout 1959.
-- Nuclear Sci. Abstr.

ENVIRONMENTAL MEASUREMENTS

Improved Smoke Density Recorder. R. Lambie.
J. Sci. Instr. 37, 144-146 (Apr. 1960).

A smoke density recorder is described in which high stability is achieved by the use of stabilized circuits for the light source and head amplifier. A method of calibration by means of optical density screens standardized for the type of photocell used is given. Drift caused by deposition of smoke on the optical system was overcome by the use of hot air jets. During extended tests on laboratory and industrial installations, stable operation with negligible drift was obtained.
-- APCA Abstr.

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

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

PREVENTIVE ENGINEERING

Solving Your Air Pollution Problem. G. Gould. Power 104, 69-71 (July 1960).

Typical partial analyses of coals, oil and gas are given. Pollutants accompanying combustion include smoke and fumes, fly ash, various gases, organic vapors and acid mists. The 2 basic techniques for air pollution abatement are to minimize formation of these and to minimize those formed. Variation of heating values in coals is significant—in gas and oil it is of much less importance. Sulfur in coal occurs as iron sulfide and organic forms—in oil as mercaptans, sulfides and disulfides. Sulfur dioxide is obnoxious and can be detected in concentrations as low as 1 ppm. Sulfur trioxide reacts with moisture to form sulfuric acid. This is irritating to the respiratory system in concentrations of 3 ppm. Some relationship exists between volatile content of fuel and smoke. Rapid and complete combustion of fuel is essential. High ash content increases the air pollution possibilities of the fuel. Dust from coal storage and handling is a problem. Wetting or treating with oil will assist in controlling this nuisance. High moisture content in coal can cause heavy smoking.
-- Public Health Eng. Abstr.

289 New Advances in Fly-Ash Control. H. B. Alford. Combustion 32, 45-49 (July 1960).

The ever increasing demand for cleaner stacks, to meet anti-air pollution regulations, has resulted in improved boiler and fly ash collector design. Resistivity of the ash particles is one of the major factors which determines the ease of electrostatic collection. Particles of over 20 microns are easily removed by mechanical cyclonic collectors but electrostatic collectors are required to remove particles of smaller size. New precipitator design provides maximum electrical stability, minimum dust erosion, maximum thermal stability and better gas distribution qualities. Recent improvements on "Rapper" controls, power controls and mechanical power controls provide an impetus of major significance in the constant advances in fly ash collection. -- Public Health Eng. Abstr.

290 Garage Health Hazards and Ventilation. C. R. Ross and L. Rispler. Occ. Health Rev. (Ottawa) 11, 2-6 (1960).

Carbon monoxide exists in gasoline engine exhaust gases in concentrations ranging from over 10% at idle speed to about 3% at full speed. The amount of carbon monoxide in the exhaust of diesel engines is less than in gasoline engines. Local exhaust systems remove air contaminants at their points of origin before they can escape into the general atmosphere. These systems should be considered because they obtain positive control of contaminants with a minimum amount of air. An exhaust system consists of hoods or enclosures at the sources of air contamination, branch and main ducts through which an air stream transports the contaminant outdoors, a fan to produce the required air flow, and in some cases an air cleaner. -- APCA Abstr.

291 Activated Carbon Filters Control Radioactive Vapors. T. T. Porembski. Air Cond. Heat. and Vent. 57, 97-98 (Nov. 1960).

A newly designed activated carbon and stack system to handle radioactive iodine vapor is operated in conjunction with existing air cleaning facilities at the Radioactive Materials Laboratory. The new facility will permit immediate sectioning and chemical and corrosion testing of irradiated samples which otherwise could not be handled until the samples had sufficiently decayed and are safe to handle. Proper operation of the ventilation system depends upon the following factors: (1) Assurance that all isolation boxes are sealed. (2) Proper equipment operation. (3) Proper air balancing. (4) Assurance that the isolation boxes are under negative pressure. The activated carbon filters, 95% efficient, used 2 in a series, provide a concentration reduction of 4×10^4. The system has been found very satisfactory for the containment of radioactive effluents. -- APCA Abstr.

COMMUNITY AIR HYGIENE

292 Evaporated Metal Films as Indicators of Atmospheric Pollution. J. P. Lodge, Jr. and Bernice R. Havlik. Intern. J. Air Poll. 3, 249-252 (Oct. 1960).

As a substitute is proposed for present techniques of measuring atmospheric corrosiveness, namely the use of evaporated metal films a few hundredths of a micron in thickness. Glass slides covered with films of aluminum, iron, lead, copper and silver were prepared and exposed in the Cincinnati area. Corrosion products were identified by means of x-ray diffraction and microchemical methods. Corrosion results in an increase in light transmission by the film, which can be taken as a quantitative measure of corrosion. Preliminary results showed aluminum to be the most dependable indicator of general atmospheric corrosiveness, although silver appeared specifically sensitive to a small group of pollutants, such as

halogens, ozone, and sulfur compounds. Lead corroded so rapidly as to be difficult to interpret while iron was shown to be responsive primarily to relative humidity. Fair correlations were obtained with independent measures of pollution level. Some exploratory work was done on the measurement of the electrical resistance of the films. Authors' abst.

293 "Invisible Injury" of Bush Beans by Atmospheric and Aqueous Fluorides. H. G. Applegate and D. F. Adams. Intern. J. Air Poll. 3, 231-248 (Oct. 1960).

Bush beans, Phaseolus vulgaris var. humilis, when subjected to either gaseous fluoride or solutions containing fluoride, have abnormal oxygen uptake when compared with similar plants not subjected to fluoride. Plants given gaseous fluoride for 24 hours prior to harvest consistently had greater oxygen uptake than their control counterparts. Plants given continuous fluoride from time of germination had, with the exception of a short period around the fifth day, greater oxygen uptake than their control plants. Between the fourth and sixth days, continuously fumigated plants had a lower oxygen uptake than the unfumigated control plants. There appeared to be little difference in respiration patterns between gaseous fluoride-mediated respiration and aqueous fluoride-mediated respiration. This physiological disturbance induced by fluoride which has been demonstrated is considered to be an example of "invisible injury", by classical definition. -- Authors' abst.

294 The Influence of Smelter Fumes Upon the Chemical Composition of Lake Waters Near Sudbury, Ontario, and Upon the Surrounding Vegetation. E. Gorham and A. G. Gordon. Can. J. Botany 38, 477-487 (July 1960).

Analyses for sulfate, calcium, and pH have been made on surface waters from 102 lakes and ponds in the Sudbury metal-smelting district, and data are presented for 35 of these. Sulfur pollution is frequently high within 5 miles of the 3 smelters, many ponds exhibiting more than 3 times the sulfate concentration normal for this area, and 3 waters more than 10 times this level. Outside about 15 miles distance the influence of smelter pollution upon sulfate concentrations in surface waters is negligible. As expected, many of the most polluted waters are strongly acid, with pH values going as low as 3.3. Sulfuric acid from air pollution has also led to increased weathering of calcium from soils and rocks, so that this ion tends to rise in concentration not only in waters above pH 6 but also in those below pH 5. Damage to terrestrial vegetation is frequently marked within 5 miles of the smelters, while it is seldom obvious to the untrained eye beyond this distance. Severe damage occurs chiefly within about 2 miles of the smelters. -- Public Health Eng. Abstr.

295 Why Industry Needs Performance Standard Zoning. Dorothy A. Muncy. J. Air Poll. Control Assn. 10, 282-284 (Aug. 1960).

Zoning controls are required to guide the development of open land in the suburbs which still lack the protection of an air pollution agency. The use of performance standards in a zoning ordinance is a necessary measure to protect vacant land for future industry. Eight trends in industrial land use are significant to the prevention of air pollution and to the protection of land for future industry; 4 of these trends result directly from industrial management decisions and should guarantee the comparability of future plants. The next 3 trends in suburban growth could handicap industry's efforts to improve its location. The 8th trend in suburban growth illustrates the critical need for performance standards in land use zoning. These trends are discussed in detail.—Standards formulated now to guide new industrial growth can be a major preventive measure, until the time when the whole region is protected by a full-scale air control agency. -- APCA Abstr.

296 Studies on the Sanitary Nuisance of Smoke-Gases from a Sulfate Cellulose Factory. (1) An Interview Study. L. Friberg, E. Jonsson and R. Cederoflof. Nord. Hyg. Tidskr. 41, 41-50 (1960).

This article presents the results of an interview study covering about 400 persons selected at random from the population living within 20 km. (12.5 miles) of a sulfate cellulose factory. The main purpose of the investigation was to study the inconvenience caused by air pollution from the factory. The "sulfate smell" disturbed 36% of those interviewed, and one-third of those interviewed described their discomfort as severe. Despite the complaints only 5% considered it disadvantageous that the factory was situated in the tract. Comparisons between different parts of the area investigated indicated the existence of a correlation between the situation of the residence of the individual interviewed in relation to the factory and the comparative incidence of persons disturbed. The investigation showed that certain groups of people were more discomforted than others. Women were disturbed more than men and younger more than older. Moreover, there was some relation between the discomfort caused by the odor and discontent. It was also evident that persons disturbed by the sulfate odor complained about the odor from the factory in the area to a greater extent than persons not disturbed by the sulfate odor. -- APCA Abstr. 30

297 Studies on the Sanitary Nuisance of Smoke-Gases from a Sulfate Cellulose Factory. (2) Determination of the Olfactory Threshold for Smoke-Gases. L. Friberg, R. Cederoflof and E. Jonsson. Nord. Hyg. Tidskr. 41, 51-62 (1960).

A comparative investigation was made of the intensity of the odor of 5 smoke-gases of varied character and deriving from different processes in the production of pulp in a sulfate cellulose factory in Southwestern Sweden. The investigation was carried out to provide a basis for the technical planning of rational air-purification measures aimed at decreasing the distressing odors emanating from the industrial area. Twenty men and 20 women living in the area, half of whom were under 50 years of age and half over that, were selected as test subjects. The olfactory threshold determinations were based on so-called paired comparison and each subject needed only to decide whether one of the gases in a given pair smelled more strongly than the other or if they were of equal strength. The comparisons were made between the different gases, 2 by 2, in concentrations corresponding to their volumetric proportion (from 10^{-7} to 10^{-2}) in the mixed gas emitted from the top of the chimney, and fresh air. The results showed that it is possible with this simple method to determine the relative intensity of the odor of the gases and that an approximate measure of the olfactory threshold for the different gases could be obtained with a degree of precision that satisfied the practical demands placed by the technical problem to be solved. -- APCA Abstr. 301

298 Absolute Judgment of Odor Quality. T. Engen and C. Pfaffman. J. Exp. Psychol. 59, 214-219 (Apr. 1960).

A series of experiments were carried out to determine how well the human subject can identify odor qualities by label (the subject's own association to the odorant) with different kinds, intensities, and numbers of odorants. Analysis of these identifications yielded approximately 4.0 bits of information. The results were influenced by variations in the sample of odor qualities but not appreciably by intensity characteristics of the odor qualities. The information transmitted for a combination of 1.5 bits obtained for intensity earlier and the 4.0 bits obtained for quality did not exceed that for quality alone. The discussion of the results compared the span of absolute judgment in olfaction and other sense modalities with respect to unidimensional and multidimensional stimuli. -- APCA Abstr.

299 Experimental Research on the Link Between Atmospheric Pollution and Lung Cancer. L. M. Shabad. Intern. J. Air Poll. 3, 221-230 (Oct. 1960).

In this paper the experimental study of the carcinogenic effect of air pollution and its role in the etiology of cancer of the lung is discussed with particular reference to the work in the U.S.S.R. The carcinogenic hydrocarbon 3:4 benzpyrene has been shown to be present in

the atmosphere and in the smoke from Russian cigarettes. Tarry products from air pollution have been tested by skin painting and subcutaneous experiments in mice and malignant tumors were obtained in about 8% of the cases. Adenomatous lung tumors were also produced in mice. Earlier experiments had also shown that painting the skins of mice with tar increased the number of lung adenomas. Further, when the progeny of these painted animals were themselves painted with tar, lung adenomas occurred twice as frequently as in the parents.

-- Author's abst.

MANAGEMENT ASPECTS

300 Health Insurance and Comprehensive Medicine. M. R. Stalker. Can. Med. Assn. J. 84, 155-158 (Jan. 21, 1961).

A successful program of comprehensive health insurance cannot be provided without sound basic medical service. The development of such a service requires a new outlook in undergraduate and postgraduate training of the basic physician. As the pattern of specialized medicine was developed in the field of education, so the leadership in this new outlook must be educational. Adoption of these concepts of medical education and practice will provide for a united profession which, in conjunction with the economists of organized medicine, will be in a sound position to negotiate with government. In this changing and troublesome world scientific medicine has made and is making remarkable progress in the healing of the sick. Through the long pages of history, the medical profession has maintained a revered and preferred position because of its integrity, humanitarian outlook and intimate association with people. This will be continued with unity and sympathetic understanding. -- Author's summary

301 Unemployment Experiences of Older Workers—Impact on Political and Social Attitudes. H. L. Sheppard. Geriatrics 15, 430 (1960).

This paper reports a study sponsored and financed by the Joint Institute of Labor and Industrial Relations of the University of Michigan—Wayne State University. It concerns the unemployment and re-employment experiences of 500 workers over 40 years of age who lost their jobs in 1956 owing to the permanent shutdown of a large American automotive company. Among the factors involved were age, skill and race. The major automotive companies in the area discriminated against older workers. The group hardest hit were those between 55 and 64 years of age. Their chances of obtaining employment were one-quarter of those for the worker under 45. Moreover at least 40% of those workers fortunate enough to find some type of work again, regardless of whether they kept it, were required to accept jobs at skill levels below their previous jobs. Race seemed of no significance, possibly because discrimination on racial ground is prohibited in Michigan. Their experiences had a deteriorating effect on their morale, expectations, and feelings of importance in the community. The decrease in personal morale was just as great for those re-employed at a lower skill level as for those not re-employed at all. The feelings of social alienation were positively correlated to length of unemployment. The responsibility for such a situation is a social one. Suggested remedies include a program of adequate unemployment compensation, a program of special retraining and counseling for older workers, and the outlawing of discrimination on a national level because of chronological age. -- Can. Med. Assn. J. Abstr.

302 Safety—Its Relation to Cost and Production. A. L. Anthony. Natl. Safety News 83, Journal 6—Journal 10 (Feb. 1961).

There are 2 costs involved in any personal injury accident—the direct cost, and the indirect cost. The direct cost is also known as the "insured" cost. For the present purpose this can be considered as the amount of money paid to insured employees for workmen's compensation benefits as established by state law, plus the cost of medical treatment. The indirect cost, which can also be called the "uninsured" cost, may be, and usually is greater than the direct cost. It is "hidden" or "incidental" and thus indirect, because much of it cannot be easily determined in dollars and cents. Many years ago a study was made which revealed that on national averages, the indirect costs are 4 times greater than the direct costs. In recent years, there have been articles in trade journals which indicate that this 4 times factor may no longer be true. They indicate that in most cases, this figure is conservative. Safety men who have made studies of their operations have stated that this factor is now between 7 and 14 times greater than the direct costs. This becomes a very significant cost of operation, and one which can easily be overlooked unless safety accepts its responsibility to make it recognized. Ten items concerning indirect costs are presented. The paper further includes the following topics: Who pays for accidents? Ten-year frequency, severity rates; increase in workmen's compensation; compensation rate index; provide management with loss data; and safety, cost and production. Data are illustrated by graphs and tables.

303 The High Cost of Slips and Falls. Anon. Occ. Hazards 23, 37-39, 60 (Feb. 1961).

Falls from one level to another are the most expensive accidents in industry. Experience in 6 states shows injuries caused by this kind of fall cost roughly twice as much as injuries involved in other accidents. However, slips and falls that take place on the same level should not be discounted. Accidents to people who skid on grease or trip over pallets that stick out into aisles can cost plenty. Their compensation demands slightly more per case than ordinary accidents, and there are 12% more same-level falls than falls from one level to another. The number of claims due to falls on the same level about equals the number caused by accidents with machinery. Even compensable automobile accidents take less per case than falls. In Florida, Illinois, Minnesota, New Jersey, New York, and North Carolina, compensation benefits for injuries from falls between levels averaged $1,129 per case several years ago; benefits for injuries from motor vehicle accidents averaged $1,066. Costs are higher now, because of increased benefits; but proportions probably remain the same. All this does not consider the human factor. It does not tell how much pain, paralysis, wage loss, personal bankruptcy, family upheaval, emotional and mental wear and tear, comes to those who get hurt in falls. Yet the human cost is, in the long run, more important than the immediate financial costs of falls. Business and society alike suffer with the injured workers and their families.

304 How Much Safety Factor? R. F. Schoof. Natl. Safety News 83, Journal 11—Journal 14 (Feb. 1961).

Many safety requirements have been established by governmental bodies, standards associations and industry groups to protect the public against injury and loss. In addition to complying with prescribed safety requirements, the designer must provide an acceptable product having a long service life. At the same time, the designer is called upon to make efficient use of materials. The author presents a simple six-part analysis in which the following factors are discussed: (1) Loss factor. (2) Load factor. (3) Stress analysis factor. (4) Fabrication and assembly factor. (5) Time factor. (6) Economy factor. This six-step analysis of a spe-

application can give a definite basis for the selection of a safety factor. Where large production volumes are being contemplated, there is often a desire to reduce a factor of safety and thereby cut initial costs. Any reduction from established norms should be made only with a full understanding of all the factors involved. A major decrease in a previously accepted factor of safety can rarely be made. However, decreases of 10 to 15% are often feasible and safe. For common designs, experienced designers develop standard stress levels based on accepted *safety factors*. *These factors may be established from a variety of sources.* The selection of a safety factor is frequently governed by accepted standard design stresses or by municipal or state codes. However, many times, particularly on machine parts and devices, the selection of a safety factor is required in the early design stages. By reference and use of the six factors listed, this choice can be made using a comprehensive methodical analysis. True safety factors relating the damaging stress to the actual design stresses can be established, accurately representing the safety level intended by the designer.

305 Eye Injuries Due to Power Lawn Mowers. D. Barsky. Arch. Ophthalmol. 64, 385 (Sept. 1960).

Five cases of missile eye injuries due to power lawn mowers are reported, covering a 4-year period beginning September 1955. In 3 cases, vision was totally lost. The need for safety features in the rotary type power lawn mower is stressed. Public awareness of the eye hazard should be aroused. -- J. Am. Med. Assn. Abstr.

MISCELLANEOUS

306 Research in Water Pollution. F. G. Livingstone. Water & Sewage Works 107, 126-128 (Mar. 1960).

This is a brief report of the research being conducted in a special laboratory for water pollution research of the Department of Scientific and Industrial Research in Great Britain. Tests were made on a new anionic surface-active material that had been developed by detergent manufacturers seeking to find a biological soft substance. In trickling filter pilot plants, it was found that about 90% of the new type of detergent was removed as compared with about 68% of the material presently being marketed. Owing to the fact that the new laboratory is situated in a community where domestic sewage and industrial wastes can be kept completely separate, precise studies were made of the characteristics and rate of flow of domestic sewage. The laboratory has investigated possible methods of pre-treatment of tannery wastes to remove suspended matter, toxic metals, and sulfide, and also to neutralize excessive alkalinity. Waste flue gases could be used to form calcium carbonate, to strip out the hydrogen sulfide, and to neutralize alkalinity. The waste gases containing hydrogen sulfide could then be passed through coke-packed filters irrigated with weak tannery wastes. Hydrogen sulfide is absorbed and oxidized biologically to sulfuric acid. Studies are also being made of treatment of tannery wastes by trickling filters. Simple cyanides and less stable complex cyanides may be treated with ferrous sulfate and an alkali prior to discharge to a municipal sewer. Where a higher degree of treatment is needed, chlorine and caustic are used. Almost complete removal of cyanide was affected from a solution of NaCN equivalent to 90 mg./liter HCN at a flow rate of 700 gal./cu. yd./day, with temperatures above 10°C.
-- Cond. from Public Health Eng. Abstr.

307 Chemical Coagulation and Pressure Flotation for Aircraft Oil Wastes. E. J. Malhood. Wastes Eng. 31, 434-437 (Aug. 1960).

The waste flows in the United Air Lines Maintenance Base at San Francisco International Airport originate from numerous cleaning operations of engines, engine parts, accessories and air frame parts as well as paint stripping. The average workday wastes flow

was 190 gpm with peak flows reaching 290 gpm. The wastes had a concentration of total oil varying from 500 to 1,200 ppm of which 250 to 700 ppm were highly stable emulsified oil. To break and separate the oil, a number of commercial coagulant aids were tested and found to be ineffective, as were simple acid or alkaline treatments. Eventually pressure flotation, preceded by chemical coagulation with alum and activated silica was found to be effective and selected as the appropriate treatment. A flexible, compact, and neat plant, designed to carry out the process, occupies a site 92 feet by 45 feet and has been in operation successfully for a year. A flowing-through diagram is presented. Design requirements and details are briefly described. -- Public Health Eng. Abstr.

308 Plating Waste Treatment—No Longer a Necessary Evil. L. A. Greenburg. Ind. Eng. Chem. 52, 33A-34A (Aug. 1960).

A process is described for simultaneous treatment and removal of the liquid film of plating solution which adheres to the part as it is removed from the plating bath. A treatment wash tank is substituted for the first rinse tank. For cyanide plating wastes, the wash solution is maintained at pH 10 to 11 by addition to the caustic and chlorine feed rate which is set to maintain 300 to 500 ppm available chlorine to completely oxidize the cyanide waste on the work piece. The wash solution then flows into a reservoir tank where the insoluble metal hydroxides and oxides settle out. An integrated treatment system, providing for continuous addition of chemicals and recirculation of the wash solution, is more economical to construct and operate than a batch unit. Non-toxic salts slowly accumulate in the treatment solution, and a fresh solution is made up after 2 to 4 months. -- Public Health Eng. Abstr.

309 What About Laundramat Detergents? Anon. Wastes Eng. 31, 338 (July 1960).

Laboratory tests were sponsored by the New York State Water Pollution Control Board as described in detail in their Research Report No. 5, which indicated that by batch tank chemical treatment with alum, soda ash, and activated carbon, the effluent concentration of synthetic detergent can be reduced to 1 to 2 ppm. -- Public Health Eng. Abstr.

310 Glass Drainlines for Disposal of Corrosive Wastes. E. K. Lofberg. Ind. Wastes 5, 62-63 (June 1960).

Pyrex glass drainlines are now available which are guaranteed against corrosion or joint leakage for the lifetime of the building. The glass pipe is resistant to all corrosive agents except hydrofluoric acid or hot alkalis. Corrosion-resistant teflon is employed as the gasketing material. Glass piping is easy to assemble, readily dismantled, transparent, and everlasting. Over-all cost is low. The use of glass pipelines has been approved by the Western Plumbing Officials' Association. -- Public Health Eng. Abstr.