

NWBB-0018917

Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL

OCTOBER, 1961

(Vol. 25, No. 10)

INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE -- PITTSBURGH 13, PA.

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IN THE ABREAS November 1993

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INDUSTRIAL HYGIENE FEATURES

A discussion of the identification and control of major industrial medical cases is presented in Abst. No. 951.

Data concerning the differential diagnosis of bronchiectasis and bronchitis are given in Abst. No. 956.

Bundle branch block among employed persons is the theme of Abst. No. 958.

Consult Abst. No. 959 for information regarding the management of hypertension and "low blood pressure" in the employee.

Abst. No. 961 reports on the solitary pulmonary nodule and lung malignancy.

A study on smoking in relation to physical complaints is given in Abst. No. 964.

See Abst. No. 969 for information on skin cancer and occupation.

Consult Abst. No. 975 for details on the toxicology of selenium and tellurium.

Bone marrow changes in chronic cadmium poisoning in rabbits is the title of Abst. No. 979.

Abst. No. 980 discusses the comparative toxicology of iron compounds.

Abst. No. 995 reports on studies of experimental silicosis in dogs.

Asbestosis in a worker engaged in automobile undercoating is investigated in Abst. No. 997.

Abst. No. 1002 is concerned with medical problems of underwater depths.

Consult Abst. No. 1006 for details on the measurement of rocket engine noise.

Abst. No. 1020 reports on fallout and man's diet.

Information concerning air pollution from the grain industry is given in Abst. No. 1028.

FOUNDATION FACTS

NEW MEMBER. The Foundation welcomes to membership The Cooper-Bessemer Corporation.

26th ANNUAL MEETING THIS MONTH. The immediate response to the invitations for our 26th Annual Meeting which will be held here at Mellon Institute, Pittsburgh, on October 25-26, 1961 has been most gratifying. We trust that every member company will be represented at these conferences and are confident that those in attendance will find the meeting both profitable and interesting.

DR. PAUL GROSS, the Foundation's Research Pathologist, participated in a Post-Graduate Course on Diseases of the Chest sponsored by the American College of Chest Physicians, on September 26, in Philadelphia. He also attended a meeting of the Planning Committee for the Conference on Respiratory Disease in Industry on October 14, in Philadelphia.

THEODORE F. HATCH, I-H-F Trustee and Engineering Adviser has been appointed to the Advisory Committee to the Surgeon General on Occupational Health. This Committee meets at least once a year to advise on needs and Public Health Service activities in the field of occupational health. Members of the Committee are selected from industrial management, organized labor, State health and labor departments, and the professions in occupational health.

NEW REPRINT. "Detachment of Sections of Tissue - Its Prevention" by Ethel B. Tolker and Paul Gross. Am. J. Clin. Path. 36, 188 (August, 1961). Reprints available from the Foundation upon request.

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IN RE: ABRAHAM'S

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INDUSTRIAL HYGIENE TRAINING COURSE

Conducted by

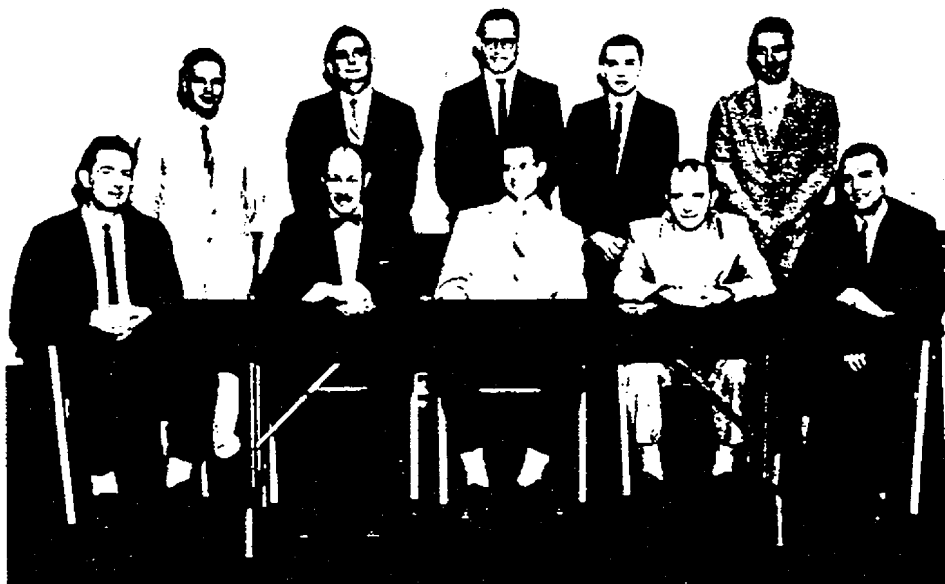
INDUSTRIAL HYGIENE FOUNDATION

and

OCCUPATIONAL HEALTH RESEARCH TRAINING FACILITY
U. S. PUBLIC HEALTH SERVICE

at

Mellon Institute, Pittsburgh, September 11-22, 1961



Engineers and Chemists attending Industrial Hygiene Training Course.
Standing - left to right - D. J. Templet, Allied Chemical Corp.; M. J. Peake, General Mills, Inc.; Charles A. Peterson, Deere & Company; John Suitless, Weirton Steel Company; R. Duane Pollock, Boeing Airplane Company.
Seated - left to right - William B. Eastman, Kaiser Aluminum & Chemical Corp.; Ralph C. Wands, Minnesota Mining & Manufacturing Company; Robert J. Heaney, Kennecott Copper Corp.; R. D. Weaver, Minneapolis-Honeywell Regulator Co.; William Milon, Bacharach Instrument Company.
(Also attended some of the courses, but not in picture: Frank Donley, Carborundum Company and Charles Haun, Union Carbide Corp.)

This was the second training course conducted by the Foundation for industrial hygiene engineers and chemists, and again, the results were most gratifying. It was an intensive two-weeks devoted to laboratory work, lectures, and homework assignments. Students personally prepared known concentrations of gases and vapors, calibrated gas sampling instruments, used gas detectors, made chemical analyses and ventilation measurements. Lectures and demonstrations covered such subjects as pneumoconioses, toxicology, radiation, noise and industrial hygiene practice. The course was completed with a final examination which was followed by presentation of Certificates of Training to this second graduating class. The attention, industrious and business-like attitude of the students was highly commendable. Again, we feel that the course served a very useful purpose and provided the participants with knowledge and experience which will serve them well. Future courses of this type are planned.

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NOVEMBER 1961

INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

936 PHS Reorganizes for Expanded Services.

Establishment of a New Division of Environmental Engineering and Food Protection in the Public Health Service has been announced by Surgeon General Luther L. Terry. The new Division, with Wesley E. Gilbertson as its Chief, was created as part of a Service-wide reorganization designed to strengthen and expand present environmental health programs, and to provide more assistance to state and local health agencies. Functions now assigned to the new Division were formerly performed by the Division of Engineering Services, which has been abolished. These programs are concerned with basic problems in environmental health and sanitary engineering, primarily those of mounting concern to local agencies, particularly in urban centers. Included are a variety of general sanitary engineering activities. For more efficient handling of public health problems created by environmental hazards, the Service has established an Office of Resource Development within the Bureau of State Services. Frank A. Butrico heads the new office, which will be primarily concerned with air and water pollution, exposure to radiation, and occupational and industrial developments. -- Civil Eng.

937 More Information Required in Labels.

Manufacturers of prescription drugs will have to furnish more information in labels, under a FDA rule slated to take effect March 5, 1962. The Food and Drug Administration will require each package of a prescription drug to contain an insert which gives complete information about the drug's use, including harmful side effects and contraindications. This information can now be omitted if the label says "literature available on request". Industry opposed the new regulation on the ground that it would substantially increase costs. But FDA Commissioner George P. Larrick says: "Furnishing reliable information for the professional use of prescription drugs in the package will constitute only a small fraction of the cost of promotion".

-- Chem. Eng. News

938 Methyl Ethyl Ketone.

Properties and essential information for the safe handling and use of methyl ethyl ketone are described in a new chemical safety data sheet published by the Manufacturing Chemists' Association. The vapor of methyl ethyl ketone is irritating to the eyes, nose and throat. The irritating property serves as a good warning since it occurs at concentrations below that level at which any symptoms occur. Methyl ethyl ketone is a low flash flammable liquid and its vapors form explosive mixtures with air over a fairly wide range of concentrations. Methyl ethyl ketone is also quite volatile, and the vapor which is heavier than air may accumulate in low spots or travel along the ground and be ignited by sparks or other flames at locations remote from the handling site. Safety in handling methyl ethyl ketone depends, to a great extent upon the effectiveness of employee education, proper safety instructions, intelligent supervision, and the use of safe equipment. Workers should be thoroughly informed of the hazards that may result from improper handling of methyl ethyl ketone. They should be cautioned to prevent spills and thoroughly instructed regarding proper action to take in case they occur. Each employee should know what to do in an emergency and should be fully informed as to first aid measures. Copies of Chemical Safety Data Sheet SD-83 on methyl ethyl ketone are available at 30 cents each from the Manufacturing Chemists' Association, Inc., 1825 Connecticut Avenue, N.W., Washington 9, D.C.

939 Pittsburgh Sanitary Engineering Conference.

The 3rd Pittsburgh Sanitary Engineering Conference will be held November 4, 1961 at the Graduate School of Public Health, University of Pittsburgh. The conference will be of interest to sanitary engineers, municipal officials, disposal plant operators, sanitarians, and equipment manufacture representatives. Send pre-registration fee of \$5.00 (which includes luncheon) to Dr. Eugene Weisberg, 1626 Forbes Avenue, Pittsburgh 19, Pa.

-- Chem. Eng. News

OCCUPATIONAL DISEASE STATISTICS

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

	Conn. <u>July</u>	Pa. <u>Aug. -Sept.</u>	Tenn. <u>Aug.</u>	<u>Total</u>
Allergy to flour		2		2
Asthma		1		1
Berylliosis	1			1
Berylliosis (possible)		1		1
Dermatitis	27 *	32	13	72
Insecticide poisoning		1		1
Lead poisoning		3		3
Pneumoconiosis		11		11
Pneumoconiosis (suspected)		3		3
Silicosis		20	1	21
Silicosis (suspected)		9		9
Total	28	83	14	125

* Causes are listed as follows:

Connecticut: Occupational dermatitis due to plants: wood dust 1, poison ivy 1; occupational dermatitis due to oils and greases and metal cutting compounds 5; occupational dermatitis due to solvents 4; occupational dermatitis due to other chemicals: alkalis 1, glues 1, inks 1, multiple chemicals, etc. 2, plating chemicals 2, synthetic resins or resin compounds (plastics) 3; occupational dermatitis—other: heat 2, undetermined 2; unspecified 2.

COMING EVENTS

- 941 Oct. 30-Nov. 1 Association of Official Agricultural Chemists, Washington, D. C.
 Oct. 31-Nov. 2 Interscience Conference on Antimicrobial Agents and Chemotherapy,
 American Society for Microbiology, New York, N. Y.
 Nov. 1-3 Pittsburgh Diffraction Conference, Mellon Institute, Pittsburgh, Pa.
 Nov. 1-3 Industrial Engineering & Management Clinic, 25th Anniversary. Industrial
 Management Society, Chicago, Ill.
 Nov. 1-3 Parenteral Drug Association, Annual Convention, New York, N. Y.
 Nov. 1-3 American Concrete Institute, 14th Regional Meeting, Birmingham, Ala.

- Nov. 2-3 10th Instrumentation Conference, Louisiana Polytechnic Institute, Ruston,
 Nov. 6-7 Symposium on Meteorological Air Pollution, U. S. Public Health Service,
 Division of Air Pollution, Cincinnati, Ohio
 Nov. 6-8 American Occupational Therapy Association, Detroit, Mich.
 Nov. 6-8 Atomic Industrial Forum, 8th Annual Meeting in Conjunction with American
 Nuclear Society, Chicago, Ill.
 Nov. 6-8 Chemical Institute of Canada, Chemical Engineering Division, Conference,
 Toronto, Ontario, Canada
 Nov. 6-9 Atom Fair '61, 7th Trade Fair of the Atomic Industry. Atomic Industrial
 Forum and American Nuclear Society, Chicago, Ill.
 Week of Nov. 6 9th Hot Laboratory and Equipment Conference, Joint with American Nuclear
 Society, Atomic Industrial Forum, and Atom Fair, Chicago, Ill.
 Nov. 7-9 International Conference on Measles Immunization. University of Colorado,
 National Institute of Allergy and Infectious Diseases, and Division of
 Biologics Standards. National Institutes of Health, Bethesda, Md.
 Nov. 7-10 American Nuclear Society, Joint with Atomic Industrial Forum and Atom
 Fair, Chicago, Ill.
 Nov. 8-11 Institute of Management Sciences, 2nd American Meeting, Joint with Opera-
 tions Research Society of America, San Francisco, Calif.
 Nov. 10-12 Gerontological Society, Inc., Pittsburgh, Pa.
 Nov. 13-15 American Petroleum Institute, 41st Annual Meeting, Chicago, Ill.
 Nov. 13-17 American Public Health Association, 89th Annual Meeting, Detroit, Mich.
 Nov. 14-16 American Meteorological Society, General Meeting, Tallahassee, Fla.
 Nov. 15-17 Eastern Analytical Symposium, New York, N. Y.
 Nov. 21 Manufacturing Chemists' Association, Semiannual Meeting, New York, N. Y.
 Nov. 21-Dec 1 Conference on the Uses of Radioisotopes in Animal Biology and the Medical
 Sciences. International Atomic Energy Agency, Food and Agricultural
 Organization and World Health Organization, Mexico City, Mexico, D. F.
 Nov. 24-25 American Physical Society, Chicago, Ill.
 Nov. 25-27 American College of Chest Physicians, Interim Session, Denver, Colorado

LEGAL DEVELOPMENTS

942 Compensation News. Changes in the Law.

New York, effective January 1, 1962, extends compulsory compensation and occupational disease coverage to employers of one or more. Until 1959, employers of 4 or more had to be covered. Each year since, the number of employees for required coverage has been reduced by one. During the term in office of Governor Nelson Rockefeller, 390,000 more workers have been brought under the New York compensation act. New York employers, effective July 1, may not ask apportionment of liability among previous employers if their workers contract compressed air disease. Illinois set up a trust fund to make sure the record in disputed occupational disease cases is complete before the amount paid for record copies is turned over to the state treasury. Massachusetts, effective August 21, increased death benefits for dependents other than wives or husbands and children. The same state, but effective August 24, increased death benefits to \$35 a week for the surviving spouse and \$5 for the first child (\$6 for each additional child), for a maximum of 500 weeks. Effective August 29, the state raised maximum disability benefits to \$50 a week, with an extra \$6 for each dependent. Total disability payments may not be more than average weekly wages. In Florida, Chairman, A. W. Brown of the Industrial Commission announced a reduction from 2 1/2 to 2% in the state tax rate on workmens' compensation insurance premiums. The reduction will save employers more than \$300,000 a year. Rhode Island no longer requires that \$750 be paid the second injury fund when a worker without dependents is killed, if the fund on May 1 is under \$500,000.

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Maximum total disability benefits, effective June 8, were set at \$40 a week, and the maximum period for paying total disability benefits at 1,000 weeks. If a Texas worker is killed on the job and leaves no dependents, costs of his last sickness and his burial will be paid, with a maximum of \$500. This became effective June 17.

-- Cond. from Occ. Hazards

943 Page the Wage-Loss Theory.

Marion Taber, an outside laborer, had a heat stroke and was totally incapacitated. He received compensation benefits. During his disability, Taber went to college. He got bachelor's and master's degrees, and began teaching in the public school system, at a salary greater than he formerly received as a laborer. His employer filed an application to terminate his benefits. The court held that when an employee is incapacitated to the extent that he cannot perform strenuous manual labor, as he formerly could, he is entitled to continue to receive benefits, even though he obtains full-time employment at higher wages. The loss of wages is not the determinative factor in allowing benefits. Claim allowed. Taber v. Tole. Kansas Supreme Court 362 P. 2d 17 (May 13, 1961).

-- Occ. Hazards

944 Silicosis and Anthracosis—Liability of Last Employer—Evidence of Injurious Exposure.

Claimant was not entitled to compensation from his last employer for disability due to silicosis or anthracosis because he did not sustain an injurious exposure while in that employment. Claimant, a 57-year old worker in the coal fields, was forced to quit work after 14 months of employment by the defendant as a hauler of coal. He previously had been employed for over 35 years in various capacities by other employers in the coal mining industry, over thirty years inside the mines and later years on the outside. Without detailing the evidence; the court ruled that the record overwhelmingly supported the board's conclusion that the claimant's occupational disease antedated his employment with the defendant, and that there was no evidence whatsoever that the claimant had an injurious exposure during his employment with the defendant which would independently of any other cause whatsoever, produce or cause the disease for which claim is made." Affirmed. Webb v. Elkhorn Coal Company, Kentucky Court of Appeals. November 23, 1960.

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945 Liver Ailment—Exposure to Lacquer and Thinner.

Claimant was awarded compensation for disability due to a toxic inflammation of the liver which the board held to be an occupational disease. In her employment for some six years, the claimant was exposed to lacquer and thinner kept in open containers upon a table about 12 feet from where she worked. The medical testimony was in sharp conflict but the board was warranted in accepting the testimony of the claimant's medical expert who was of the opinion that the claimant's disability was due to such exposure. The record also supported a finding of occupational disease. Claimant's exposure to the fumes of the volatile chemicals constituted the essential "recognizable link" between disease and employment. Affirmed. Zecca v. J. Levinsohn & Company, Inc. New York Supreme Court, Appellate Division, Third Department, No. 2194, December 2, 1960.

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BOOKS, PAMPHLETS AND NOTICES

- 946 You and Your Hearing. N. Canfield. Obtainable from: Public Affairs Committee, Inc., 22 East 38th Street, New York 16, N. Y. 20 pp. (July 1961). 25 cents.

In a mechanism which is as complicated as that of hearing there are many parts that can go wrong. Sometimes nature plugs our ears with wax, thus impairing our hearing. This type of hearing loss is called conductive. Sound waves are blocked before they reach the inner ear. A more serious type of hearing loss, known as perceptive deafness or nerve deafness, results when something goes wrong inside the inner ear or in the nerve that carries the signals to the brain. Hearing aids perform less satisfactorily in this type of hearing loss. Most hearing losses occur gradually, unnoticed by the person affected. Once a loss is detected, the doctor will decide what treatment to prescribe. Malnourishment, chronic infection in the ears, nose or throat, an allergy, or a combination of these conditions will respond to medical treatment. In addition to treatment by medicine, certain types of hearing loss can be alleviated by surgical operation. In perceptive deafness, the structure of the ear deep in the skull or the nerve to the brain or the brain itself is affected and hence not accessible to surgical procedures. For these people a regimen of rehabilitation such as is described in the pamphlet is required.

- 947 Selected Topics in Radiation Dosimetry. Proceedings of the Symposium on Selected Topics in Radiation Dosimetry Sponsored by The International Atomic Energy Agency and held in Vienna, June 7-11, 1960. Obtainable from: National Agency for International Publications, Inc., and Unesco Publications Center, 801 Third Ave., New York 22, N. Y. 685 pp. (June 1961). \$9.50.

Reliable methods measuring the intensity of the radiations from radioactive materials and from nuclear reactors are essential to the safety of all workers in atomic laboratories and industrial plants and equally so, in the therapeutic use of radiation in hospitals, for the protection of patients, doctors, nurses, and all handlers of radioactive materials. Safety regulations are in force but cannot be effective without a wide variety of instruments and methods to measure the actual amount of radiation present, varying all the way from very faint radiations that may be present in food, air and water, to the intense radiations in a nuclear reactor. The International Atomic Energy Agency in Vienna conducted an important symposium on this subject in June 1960. For one week, 171 scientists from 28 countries described and discussed modern methods and equipment for this task. Aside from two general surveys, one by Dr. K. Z. Morgan of the Oak Ridge National Laboratory in Tennessee and the other by three French scientists from the Center of Nuclear Studies at Saclay, the papers come under the following headings: Ionization Chambers; Scintillation Devices; Photographic Dosimetry; Chemical Methods; Threshold Neutron Detectors; Counting Devices and Ionization Chamber for Neutron Dose Determination; Solid State Dosimeters for Gamma and Neutron Radiation; Special Methods for the Dosimetry of Radiation from Accelerators or Reactors; Dosimetry on Critical Assemblies. The symposium is an important one for physicists, chemists, biologists, and physicians who are engaged in work with any type of radiation.

- 948 Sprinkler Systems. NFPA No. 13. Obtainable from: National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass. 160 pp. (1961). \$1.25.

A newly revised standard for the installation of sprinkler systems has been released by the National Fire Protection Association. Providing detailed guidance on this subject, the 1961 edition of the NFPA Standard on Sprinkler Systems incorporates a substantial number of changes from earlier issues. Among the most important is provision for extended spacing of sprinklers in ordinary hazard occupancies regardless of the type of construction. Similar extended spacing is also allowed in some light and extra hazard occupancies. The NFPA Sprinkler

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Standard is almost universally used as the authoritative guide to proper sprinkler installation practices. The revised text, prepared by a representative committee under the chairmanship of Gordon F. Price of the South-Eastern Underwriters Association, Atlanta, was adopted at the recent NFPA annual meeting in Detroit.

- 949 Oil Burning Equipment. NFPA No. 31. Obtainable from: National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass. 70 pp. (1961). 75 cents.

A revised edition of the NFPA standard for the installation of oil burning equipment has just been released by the National Fire Protection Association. Adopted at the international fire safety organization's recent annual meeting, the revision permits the use of approved Type L ventilating systems in certain fuel-burning appliances. Other significant changes incorporated into the new revision include cancellation of approval of use of barometric-fed oil stoves and heaters, and a complete revision of the standard's section on air for combustion and ventilation. Widely adopted by states and municipalities to regulate the installation of oil-burning equipment, the standard also covers grade of fuel oil, design, construction, and installation of storage tanks, and many other related items. It was developed by the NFPA Sectional Committee on Liquid Fuel Burning Equipment, chaired by E. F. Tabisz, general manager of Underwriters' Laboratories of Canada.

INDUSTRIAL MEDICAL PRACTICE

- 950 Industrialization—Its Challenge to Medicine. S. Greenhill. *Lancet* 1, 1181 (June 3, 1961).

The double edged impact on a society's disease pattern is outlined. This change in disease pattern can be observed in both developed and developing countries. The societal stresses produced by industrial evolution are contrasted with those produced by technologic revolution. Hypotheses are advanced to account for these differences. Broader concepts of disease etiology and wider understanding of symptom complexes by the medical profession are considered necessary. It is suggested that future medical curricula must take these changes into account, if the role and status of the doctor is to be maintained in this era of social and technologic upheaval.

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

- 951 Identification and Control of Major Industrial Medical Cases. M. F. Bruton and R. S. Rosenbusch. *Ind. Med. & Surg.* 30, 218-220 (June 1961).

The authors have developed a control concept for the Chrysler Corporation Medical Department which fulfills a three-fold need: (1) a simple system of obtaining current information on over-all Medical Department activity and needs; (2) a means of detection and study of cases which present major elements of time-loss, disability, and high cost, and (3) an efficient method by which the industrial physician can keep posted on the progress of those patients who are beyond his direct control because of absence from work, or treatment in outside facilities.

-- Authors' summary

- 952 The Pregnant Woman in Industry. A Report from the State of Illinois Department of Public Health. Anon. *Ind. Med. & Surg.* 30, 238-240 (June 1961).

Normally, the pregnant woman may continue employment, being transferred, if necessary, to lighter or more sedentary type of job. The work should meet these requirements: (1) Pregnant women should not be employed between 12 midnight and 6:00 a.m. They should not work more than 8 hours a day, and preferably not more than 40 hours per week.

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(2) Every pregnant woman should have at least two 10-minute rest periods during her work shift, properly spaced to avoid situations that create a hazard, such as crowding at lunch time and quitting time. There should be adequate facilities for resting and opportunity to secure nourishing food. (3) Pregnant women should not be employed in the following types of work, but should be assigned to non-hazardous jobs: (a) jobs that require strain of muscles or joints, such as heavy lifting, stretching, continuous standing, prolonged sitting, stooping or walking, stair climbing many times a day or when carrying materials where the hands are not free for holding to railing; (b) jobs that require good sense of bodily balance, such as work on scaffolds or stepladders; (c) jobs in which there is a marked vibration, as well as danger of severe injury, such as near power presses, power-driven woodworking machines, or polishing machines; (d) jobs involving exposure to lead and mercury compounds, aniline, benzol and toluol, nitrobenzol and other nitro compounds, carbon tetrachloride, ionizing radiation, and other toxic substances considered to be extra hazardous during pregnancy.

- 953 Dysmenorrhea—Can be Costly. H. R. Mushlin. *Ind. Med. & Surg.* 30, 241-244 (June 1961).

Dysmenorrhea is a syndrome which occurs to a varying degree in an industrially important percentage of women in the childbearing age. There are many theories of causation, and probably more than one factor is operative in each case. The present study shows that other symptoms besides pain itself, particularly those affecting the central nervous system and the gastrointestinal tract, must be taken into consideration in treatment. Medication which can control this syndrome with a minimum of side reactions can effectively reduce disability, increase productivity, and reduce absenteeism.

-- Author's summary

- 954 Suicide Attempts with Ingestants. The Experience at a Municipal General Hospital. J. Hirsh, H. L. Zauder and B. M. Drolette. *Arch. Environmental Health* 3, 212-216 (Aug. 1961).

Of the emergency admissions to Jacobi Hospital from January, 1955, through April, 1960, of patients who had ingested toxic substances, more than 50% of them were determined by psychiatric evaluation to be cases of suicidal attempts. These 232 cases include 178 females (76.7%) and 54 males (23.3%) or a male to female ratio of 1 to 3.3. The predominant agents were barbiturates, which were used by 61.1% of the males and 57.3% of the females, or 58.2% of the total patients. The next most common agent was meprobamate (Equanil), used by 9.9% of the patients. All other agents were used less frequently and about equally.

-- Authors' conclusions

- 955 Upper Limb Damage in Pneumatic Drill Workers. L. Roche, J. Maitrepierre, E. LeJeune and J. Mermet. *Arch. maladies profess.* 22, 57-61 (Jan.-Feb. 1961). French.

The investigations described here were undertaken to study the frequency of the disabilities of the upper limb in miners which might be due to their work with pneumatic tools. In the first investigation, 93 miners were examined clinically and only those in whom signs of arthritis existed were submitted to x-ray of wrist and elbow. In 50 of these workers there were no symptoms. Among the remainder there were vasomotor symptoms in 32 chiefly of tingling and paraesthesia (25). Trophic changes existed in 4. Symptoms referable to the joints occurred in 31 miners but these were due to simple arthralgia in 21 of the men and definite arthritic changes were found in only 10 men—5 in the elbow, 4 in the wrist, and 1 case of Kienböck's disease. In the second investigation systematic x-ray examinations of wrist and elbow were carried out on 157 miners. The findings, which are set out in a table and discussed, were that definite arthritic changes were present in the elbow in 11, and in the wrist in 15 instances. In conclusion, the opinion based on the findings of these two investigations is that although it is clear that there is a relation between the work with pneumatic tools and the articular lesions, nevertheless, the resulting disability is by no means severe.

-- Bull. Hyg.

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- 956 Differential Diagnosis of Bronchiectasis and Bronchitis. J. E. Rayl, E. D. Peaseley and J. T. Joyner. Diseases of Chest 39, 591 (June 1961).

Bronchial deformity or dilatation occurs in bronchiectasis, as well as in acute and chronic bronchitis. Bronchiectasis consists of a permanent saccular or fusiform bronchial deformity following a previous pneumonia in the same area, whereas acute bronchitis has a reversible cylindrical dilatation of the dependent bronchi following an acute respiratory infection. Chronic bronchitis has diffuse bronchographic features. Preliminary clinical studies suggest that these features may be due to elevated intrabronchial pressure produced by an obstructing mechanism during cough. -- J. Am. Med. Assn. References & Reviews

- 957 Coronary Artery Disease. 2: Age-Specific Incidence of First Myocardial Infarction in White Males. R. A. Wise, et al. Am. J. Public Health 51, 866-872 (June 1961).

Data on the incidence of myocardial infarction per annum per each year of life from 30 to 64 in a known white male population has been described. The wide variation in specific age data has been smoothed by grouping in 5-year-age increments. A parabolic curve has been fitted to the data as mathematically described as reasonably accurate from ages 30 to 60 and possibly through 64. A formula $Y=0.16(X-30)+0.006(X-30)^2$ for computing the incidence of first myocardial infarction in a population similar to the one used has been presented. The incidence of myocardial infarction in women below the age of 60 is very low and in the authors' limited study was zero. The study covered a 4-year period and involved about 13,000 men and 2,400 women. -- Authors' conclusions

- 958 Bundle Branch Block Among Employed Persons. T. G. Elias. Arch. Environmental Health 3, 140-145 (Aug. 1961).

Bundle branch block alone, without signs or symptoms of organic heart disease, has a reasonably good prognosis. Right bundle branch block has a somewhat better prognosis than left bundle branch block. Myocardial infarction can be diagnosed with accuracy in right bundle branch block. In left bundle branch block, however, it is very difficult to make the diagnosis with present criteria. Care must be taken in evaluating newly diagnosed bundle branch block not to unduly alarm the patient and risk iatrogenic disease. -- Author's summary

- 959 The Management of Hypertension and "Low Blood Pressure" in the Employee. H. E. Dickson. Ind. Med. & Surg. 30, 195-199 (May 1961).

The fact that there is no specific etiology of hypertension complicates a control program in the field of Occupational Health Services. There must be an effective program of early detection, counseling, referral, and follow-up. Among 3,930 employees screened in the Georgia State Employees' Health Service, the author has found an over-all prevalence over a 4-year period of 8.3% hypertensives. Of this number, 38.7% were overweight. During the first battery of multiphasic health tests offered in 1957, 1,500 employees participated. That year, there was a prevalence of 9.6%. By the third series in 1959, this figure had been reduced to 3.3%. In 1957, 0.2% knew they had an elevated blood pressure. Of the prevalence of 3.3% hypertensive in 1959, 1.9% knew of their history. While statistical evaluation of blood pressure readings are difficult for group analysis, part of the above decreased prevalence can be attributed to the program of early detection, referral, counseling, and follow-up on the multiphasic health screening tests offered in the Georgia State Employees' Health Service. -- Author's conclusions

- 960 Atherosclerosis in India. K. S. Mathur, N. L. Patney and V. Kumar. Circulation 24, 68 (July 1961).

The extent and severity of atherosclerosis in the aorta and the coronary, cerebral, renal, and pulmonary arteries were determined in 500 medicolegal autopsies. Earliest evidence of atherosclerosis in the form of lipid spots were seen in the aorta at the age of 2 1/2

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years, in the coronary and renal arteries in the 2nd decade, and in the cerebral arteries in the 4th decade. Atherosclerotic indices rose progressively with age, showing a steep rise after the 4th decade in the aorta and the coronaries. Pulmonary arteries showed no atherosclerosis. As compared to the United States, the extent and severity of atherosclerosis after the age of 30 years was markedly low in India and significantly lower than in Japan and Jamaica. It is concluded that factors which initiate atherogenesis differ from one geographic region to another, and that the factors which initiate it are different from those influencing more advanced stages. Sex differences are apparent early in life, these are most marked at the age of 30 years, and diminish after the 5th decade. Inborn basic differences in the two sexes are suggested.

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

- 961 The Solitary Pulmonary Nodule and Lung Malignancy. C. D. McClure, et al. Arch. Environmental Health 3, 127-139 (Aug. 1961).

While a 5-year follow-up of 551 residents of Allegheny County identified by survey readers as having vaguely defined non-calcified solitary pulmonary nodules revealed only 13 (2.4%) microscopically confirmed primary malignancies, 11 of these were included in the 184 cases actually referred as having solitary nodules, giving a yield of 6.0% primary malignant lesions. Ten, or almost 1/3, of the 32 nodules diagnosed surgically were primary malignancies. A more precise definition of "solitary pulmonary nodule" applied by two expert readers enhanced the yield of primary malignant lesions to a range from 10.6% to 16.5% of the solitary nodules "referred" by either expert. If the approach is taken that initial dual readings by experts should be used to designate cases for immediate follow-up, a primary cancer yield of 4.5% would have resulted when either or both expert readers identified solitary nodules on "blind" readings of the original 70-mm. films only. When both readers agreed on the presence of a solitary nodule, this yield rose to 11.5%, but this was accompanied by a loss of sensitivity of the method. Among the 146 solitary nodule cases selected for "referral" by either or both experts were all 13 primary malignancies (a yield of 8.9%), and all but one (a hamartoma) of the 32 surgically diagnosed cases. From this study it is apparent that solitary nodules initially delineated on the basis of minifilms by fast tempo survey readers to really yield less than 5% of primary lung cancer. After a meticulous 5-year follow-up only 32 out of 551 survey-detected solitary nodules came to surgical diagnosis, and only 10, or about a third, proved to be primary malignancies—a figure consistent with reports of surgical series. This suggests that clinicians must have considerable skill in evaluating the clinical significance of lesions designated as solitary nodules in a survey. There was no clinical or histological evidence of a primary lung cancer arising from any of the 261 calcified pulmonary nodules within 5 years.

-- Authors' summary

- 962 Results of a French Survey on the Role of Tobacco, Particularly Inhalation, in Different Cancer Sites. D. Schwartz, et al. J. Natl. Cancer Inst. 26, 1085 (May 1961).

The authors report on a retrospective study of 3,937 patients with cancer who were compared with 3,614 controls, including patients with various other diseases or healthy persons. A list of cancer sites associated with smoking was established, including the lip, tongue, oral cavity, oropharynx, hypopharynx, larynx, lung, esophagus, and bladder. By considering the different criteria of tobacco consumption it was possible to separate these sites into two groups: (1) in cancer of the lip, oral cavity (excluding the tongue), oropharynx, hypopharynx, and esophagus, neither inhalation nor preference for cigarettes seemed to be significant. (2) inhalation and preference for cigarettes were significant for cancer of the lung, larynx and probably bladder. Concerning the sites listed in (2), inhalation was an important factor, independent of the amount smoked or the method of smoking. The particular significance of the cigarette was less definite; it depended, in part, on inhalation, which was associated with this type of smoking. Smokers of cigarettes-only, pipe-only, and pipe-and-cigarette smokers differed in certain respects and perhaps in their manner of smoking in general. The effect of inhalation appeared to be specific; it proved to be significant in some sites of cancer but not in others.

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

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- 963 Changes in Bronchial Epithelium in Relation to Cigarette Smoking and in Relation to Lung Cancer. O. Auerbach, et al. New Engl. J. Med. 265, 253-267 (Aug. 10, 1961).

From the standpoint of carcinogenesis, what impressed the authors most was the tremendous increase in the number of atypical cells with the increased amount of cigarette smoking. The number of sections of atypical cells in the bronchial epithelium of heavy smokers who died of diseases other than lung cancer approximated the number of sections of atypical cells in the remaining bronchial epithelium of men who died of lung cancer. In studying thousands of sections with atypical cells present, the authors observed what has the appearance of a continuous gradient from areas with a few atypical cells but otherwise normal to lesions composed entirely of atypical cells with cilia absent and a thickness of 5 or more cell rows in average depth to primary invasive carcinomas of microscopic size composed entirely of atypical cells with cilia absent and a depth of many cells from the surface to the point where invasion occurs. In the opinion of the authors the histologic evidence from this study greatly strengthens the already overwhelming body of epidemiologic evidence that cigarette smoking is a major factor in the causation of bronchogenic carcinoma.

- 964 Smoking in Relation to Physical Complaints. E. C. Hammond. Arch. Environmental Health 3, 146-164 (Aug. 1961).

A study has been made of physical complaints in relation to smoking habits in 18,697 men and 24,371 women over the age of 30. The information was obtained by questionnaire. Many different complaints were found to be associated with smoking habits. These include cough, hoarseness, shortness of breath, pain or discomfort in chest, loss of appetite, nausea and vomiting, pain in stomach, pain or discomfort in lower abdomen, diarrhea, loss of weight, easy fatigue, insomnia, and several other complaints. Some of these complaints showed a high degree of association with smoking (notably coughing, shortness of breath, and loss of appetite) while others (including some not listed above) showed only a relatively small degree of association with smoking. Cigarette smoking showed a far higher degree of association with physical complaints than did cigar or pipe smoking. The frequency of physical complaints increased with amount of cigarette smoking. Coughing was reported less frequently by people who smoke cigarettes with a low tar and nicotine content than by people who smoke cigarettes with a high tar and nicotine content. It is suggested that smoking produces coughing, shortness of breath, loss of appetite, and certain other complaints in susceptible individuals. It is also suggested that these complaints sometimes have the effect of inducing individuals to smoke less, inhale less, switch to low nicotine cigarettes, or give up smoking. Among women between the ages of 30 and 49, irregularity of menstruation was reported somewhat more frequently by smokers than by non-smokers. Nervous tension was found to be associated with smoking. It may be that nervous tension increases the tendency to smoke heavily, but it may also be that smoking increases nervous tension in some individuals (both could be true).

-- Author's summary

- 965 Heated Fats and Allied Compounds as Carcinogens: A Critical Review of Experimental Results. E. Arfmann. J. Natl. Cancer Inst. 25, 893 (Nov. 1960).

A critical review of the literature shows no valid evidence that heated fats are carcinogenic on oral administration, and chemical studies have failed to show known carcinogens in heated fats. Further, feeding experiments on rodents are considered inadequate for the demonstration of carcinogenic components in human food. Results on subcutaneous and cutaneous application of heated fats, cholesterol, and other unheated lipids are variable and inconclusive. It is concluded that subcutaneous application is not suitable to disclose dietary carcinogens.

-- J. Occ. Med. Absts.

- 966 Conceptual Changes in the Challenge of Cancer Therapy. The 1961 W. H. McGuffin Memorial Lecture. N. C. Delarue. Can. Med. Assn. J. 85, 362-371 (Aug. 12, 1961).

Until recent years, attention has been directed, in the treatment of cancer, at the control of the local primary disease. In many cases, this was a worthwhile emphasis, but it has become increasingly apparent that if the present picture is to be improved, as far as "cure"

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is concerned, means of systemic attack on the disseminated disease must be found. Methods by which deoxyribonucleic acid (DNA) changes can be induced bring into sharp focus the potential significance of selective chemotherapy, particularly when used in combination with other agents or other methods of cancer treatment. Provided the main mass of the primary tumor can be controlled by such maneuvers as surgical excision or radiotherapy, chemotherapy becomes an attractive concept in managing the asymptomatic foci of metastatic disease. As Rhoads points out, we may be already on the brink of tremendous advances in this field and the fundamental features of chemotherapy must be clearly understood by all. Until recently also only animal cancer cells have been available for the evaluation of chemotherapeutic agents, and since DNA is both species and strain specific, it is only good fortune that any of the knowledge obtained in these studies has had an effective bearing on the treatment of human tumors. However, we now have human cancers in mass production and have shown that these cultured or inoculated cells maintain the specific nucleotide sequences of the human DNA from which they developed. Knowing what to anticipate, therefore, from animal studies, it may not be long before many agents of increasing effectiveness will be available for clinical trial. This is a stimulating and exciting outlook. In animals several types of transplantable tumors can be wholly destroyed by systemic chemotherapy, bringing the magic of "cure" almost within our grasp. Why not anticipate chemical magic for therapy of human cancer also?

-- Author's conclusions

- 967 The Collagen and Elastin Content of the Lung in Emphysema. J. A. Pierce, J. B. Hocott and R. V. Ebert. *Ann. Internal Med.* 55, 210-222 (Aug. 1961).

Collagen and elastin measurements were compared in severely emphysematous and in normal lungs. The alkaline extraction method of Lowry was employed. Morphologic alterations were assessed on air-dried connective tissue skeletons of the lungs prior to analysis. The presence of emphysema was not associated with any significant alteration in collagen or elastin, or the ratio of these substances. It was concluded that pulmonary emphysema does not result from any primary dissolution or loss of lung collagen or elastin.

-- Authors' summary

- 968 Summary of the Third Conference on Research in Emphysema. Anon. *Am. Rev. Resp. Dis.* 83, 402-431 (Mar. 1961).

Chronic pulmonary insufficiency is a broad title tentatively chosen for a group of diseases which are generally labeled emphysema in the United States and chronic bronchitis in the United Kingdom. On the basis of pathologic and epidemiologic observations, various British observers believe that the disabling and frequently lethal phases of emphysema and cor pulmonale are late manifestations of a disease, chronic bronchitis, whose cause to them is known, i.e., polluted air, of both the community and the individual tobacco smoking varieties, plus recurrent bronchial infection. It has also been suggested that a genetic or acquired defect, in one or more of the pulmonary connective tissues (elastic, reticular, collagenous, cartilagenous) may play a contributing or even a primary role in these diseases. In summary, it is stated that emphysema may prove to originate from one or more of the following: chronic recurrent irritation; chronic or recurrent infection; recurrent temporary or permanent, diffuse or patchy paralysis of the cilia; overproduction and increased viscosity of bronchial mucus; abnormally prolonged retention of various inert or chemically active atmospheric pollutants; an acquired or congenital defect or abiotrophy of one or more of the pulmonary connective tissues; injury from violent coughing. The clinical manifestations of this group of diseases seem best explained by postulating individual differences in the influence of these various factors of irritation, infection, trauma, and tissue defects. The introduction is followed by summaries, prepared by the participants themselves, of the first 19 papers arranged in the order of their presentation at the conference held June 10-12, 1960, at Aspen, Colorado. -- APCA Absts.

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SKIN DISEASES AND BURNS

- 969 Skin Cancer and Occupation. A Review of Newer Concepts of Carcinogenesis Based on Animal Experimentation with Potential Occupational Skin Carcinogens. L. J. Miedler. Arch. Environmental Health 3, 276-280 (Sept. 1961).

Bringing together selected newer data on carcinogenesis, the cancer cell may be regarded as exhibiting a hereditary defect in the normal mechanism of control of cell division. Nucleic acids are basic hereditary units in the cell, and alterations therein might reasonably be suspected to occur in carcinogenesis. This concept implies a qualitative alteration in the intracellular information transfer system, and evidence has been presented suggesting the manner in which some of the carcinogens found in an occupational environment may affect the genetic material within the cell. Included in this series of agents potentially capable of affecting human skin are the polycyclic hydrocarbons, sunlight (ultraviolet radiation), x-ray, and other ionizing radiation. The bibliography contains 31 references to the subject.

-- Author's summary

- 970 Treatment of Superficial Fungous Infections with Griseofulvin. R. Q. Crotty. Ind. Med. & Surg. 30, 331-333 (Aug. 1961).

Griseofulvin (Fulvicin) was used to treat superficial fungous diseases of the scalp, skin, or nails in 14 children and 40 adults. The usual dosage was 250 mg. four times daily. Cures, apparently permanent, occurred without side effects in 34 patients. Results were unsatisfactory in one patient because of side reactions, in 3 patients who did not improve after a reasonable period of therapy, and in 3 patients who had recurrences of the infection several weeks after griseofulvin was discontinued. Therapy was not completed in the other 13 patients. The author's results indicate that tinea capitis, corporis, and cruris usually can be cleared in one month; tinea pedis requires up to 2 months, and tinea unguium must be treated for at least 4 months.

-- Author's summary

- 971 Ventricular Fibrillation in a Burned Boy. C. M. Allan, et al. Can. Med. Assn. J. 85, 432-434 (Aug. 19, 1961).

It would appear from the literature that the incidence of ventricular fibrillation in burn patients is higher than the general incidence. It is suggested that more attention should be paid to electrolyte balance than has been in the past. Potassium balance is of particular importance in this regard. From the reported cases in the literature and from other local hospitals, it would seem that in the burned patient in whom there is prolonged catabolism and chronic infection the stage is set for the production of ventricular fibrillation during the induction of anesthesia.

-- Authors' summary

- 972 Allergy to Stinging Insects. R. L. Etter, W. J. Rayner and R. H. Jackson. Ind. Med. & Surg. 30, 213-217 (June 1961).

Although the problem of insect sensitivity affects only a small portion of industrial patients, those affected are usually emergency cases. Diagnosis is often confusing and the etiology can be even more of a problem. The patient, if carried successfully through the emergency stage, should be told that he can be helped; in fact, it is the physicians' obligation to so inform him. This effect on the doctor's part may be life saving.

-- Authors' summary

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CHEMICAL HAZARDS

- 973 Benzpyrenes in Soil. M. Blumer. *Science* 134, 474 (Aug. 18, 1961).

Benzpyrenes appear to be common and fairly abundant constituents of soils. Both the carcinogenic 3,4-benzpyrene and its inactive 1,2-isomer have been detected spectroscopically in extracts of soils from rural areas of the eastern United States. -- Author's Abst.

- 974 Skeletal Sclerosis due to Chronic Fluoride Intoxication. Cases from an Endemic Area of Fluorosis in the Region of the Persian Gulf. H. A. Azar, et al. *Ann. Internal Med.* 55, 193-200 (Aug. 1961).

Marked diffuse skeletal sclerosis was observed in 8 adult tuberculous patients treated in a Lebanese hospital for chest diseases. Each had lived more than 10 years in Qatar, an oil-rich Arabian sheikdom in the region of the Persian Gulf. No similar osteosclerotic changes were noted in other patients in the same hospital. Rib specimens were obtained during thoracotomy from two Qatari patients showing diffuse skeletal sclerosis. Osteosclerosis appeared to be the result of successive linear zones of cortical and lamellar new bone formation simulating histologically the sclerotic changes seen in Paget's disease. The fluoride content of defatted and ashed rib samples from the two Qatari patients ranged between 0.843 and 1.052% compared to fluoride values ranging between 0.038 and 0.041% in control ribs obtained from Lebanese patients. The fluoride concentration in drinking water samples obtained from Qatar ranged between 0.80 to 3.45 ppm. No detectable fluorides were found in Beirut domestic water. These observations indicate that there is an area of endemic fluorosis as manifested by diffuse osteosclerosis in the region of the Persian Gulf where the fluoride concentration in drinking water is less than 4 ppm. In the United States, osteosclerotic changes attributable to chronic fluoride intoxication have been observed only in communities which use a water supply containing fluoride in concentrations exceeding 4 ppm. It is postulated that certain local factors, such as hot climate, malnutrition, and excessive drinking of tea, all contribute to the severity of fluorosis.

-- Authors' summary

- 975 Toxicology of Selenium and Tellurium and Their Compounds. E. A. Cerwenka, Jr. and C. Cooper. *Arch. Environmental Health* 3, 189-200 (Aug. 1961).

Selenium and its compounds have a toxicity to humans which varies widely from one substance to another. Although the toxicity of elemental selenium is rather low, inhaled selenium dust and fumes have given rise to irritations of the respiratory tract. If such exposure is frequent, severe pneumonitis and irritation of the lungs might result. Selenium dioxide causes dermatitis and burns when in contact with the skin. Hydrogen selenide is very toxic, causing severe irritation of the respiratory organs. Long-term systemic effects might possibly result if the exposure is repetitive. Selenium oxychloride is a severe vesicant capable of causing severe and slow-healing burns of the skin. The selenium in this compound is capable of penetrating the skin and has been found in the liver of experimental animals. Although selenium and its compounds can present an industrial hazard, this hazard can be readily overcome by providing adequate ventilation of the working area and by protection of the skin. Tellurium and its compounds are less toxic than selenium, although tellurites seem to be an exception to this rule. In industry, tellurium is usually not very hazardous. Nevertheless, care must be exercised where the element or its compounds are used. The garlic odor of the breath is a good indication of the absorption of tellurium into the system. However, the susceptibility to tellurium breath varies widely among individuals. The elimination of tellurium breath by ascorbic acid seems to be possible although this procedure might not be completely harmless. The toxicity of hydrogen telluride resembles that of hydrogen selenide in a number of respects. There are 67 references on the subject in the bibliography. -- Cond. from authors' conclusions

- 976 The Elimination of Nitrous Fumes from Blasting Gases. S. R. Rabson, J. H. Quilliam and E. Goldblatt. *J. South African Inst. Mining and Met.* 61, 152-182 (1960). (Journal of South African Institute of Mining and Metallurgy, Kelvin House, Johannesburg, South Africa *).

The detonation of blasting explosives underground is accompanied by the liberation of toxic gases and dusts. The design of a suitable underground plant to extract fumes and dust is described. For the elimination of the blasting dust many filters have been used, including vertical multi-tube, horizontal bag, self collapsing, sawdust filters, and electrostatic precipitators. The gases produced by blasting were investigated by the bubbler method of analysis to establish the proportions of the individual oxides NO, NO₂, N₂O₄, and N₂O₃. A comprehensive investigation was conducted on the amount of the various gases released from the type of explosives available. Experiments were carried out in a test tunnel under practical mining conditions.

-- APCA Absts.

- 977 The Effect of Sodium Carbonate on Packers. Girault. *Arch. maladies profess.* 21, 747-750 (Dec. 1960). French.

Since preventive measures were taken 12 years ago, there have been no further cases of nasal perforation in this soda packing factory. After complaints of nose bleeding, 21 perforations were found among 160 employees, mainly among dockers and packers, especially among those handling powdered soda. Periodic examination showed that congestion of the nasal mucosa was followed by ulceration and perforation sometimes accompanied by total cartilage destruction. Friction lesions of the skin, caused by the rough fibers of sisal sacks, were common, and the combination of sweat and soda caused ulcers similar to the brine holes of salt workers. Soda holes were mostly on hands and wrists, though the dockers who carried the sacks on their arms and not on the shoulders, had them on the trunk and arms. Those with fair skin were more prone. Eczematous dermatitis affected a few workers who handled crystals as well as a few exposed to powder. No other effects were found on bronchoscopy or annual x-ray examinations of the chest. The incidence of pulmonary tuberculosis, 5 in 15 years, was less than among a comparable number in the factory not exposed to soda. Some powder collected around the filling machines, but the greatest danger was from the powder which escaped through the wide mesh of sisal sacks on to conveyor belts, runways, wagons and barges. This was overcome by the use of jute sacks and paper containers. In 1946, nasal douching followed by the application of a hemostatic salve to the nostrils, before and after work, was started. Bleeding and ulceration have been cured by this threatment.

-- Bull. Hyg.

- 978 The Action of Arsine on Reduced Glutathione. L. Arnante, M. Magistretti and B. Pernis. *Med. lavoro* 52, 11-13 (Jan. 1961).

The authors have shown that hemolysis induced by arsine is related to a fall in reduced glutathione in the erythrocytes concerned, the glutathione being converted into oxidized glutathione. This reaction requires the presence of oxygen and shows no stoichiometric relation between arsine concentration and the amount of glutathione which disappears from the erythrocytes. The present work establishes that it is possible to restore the initial concentration of glutathione, after its disappearance, induced by arsine, by means of electrolytic reduction. This observation permits the authors to state that the action of arsine on erythrocyte glutathione is not based on the formation of a compound of arsine and glutathione, but rather arsine or one of its oxidation products (e.g., elementary arsenic) acts catalytically, on the reversible conversion of glutathione into oxidized glutathione.

-- Bull. Hyg.

- 979 Bone Marrow Changes in Chronic Cadmium Poisoning in Rabbits. M. Berlin, B. Fredricsson and G. Linge. *Arch. Environmental Health* 3, 176-184 (Aug. 1961).

Cadmium poisoning produces microcytic hypochromic anemia in rabbits. Parenteral administration of iron is followed by regression of this anemia. Femoral bone marrow was

* Address not in current List of Periodicals.

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studied quantitatively in cadmium-poisoned and control rabbits with and without iron therapy. The frequency of erythropoietic cells was calculated in relation to the total of myelopoietic cells, and the cellularity of the marrow per unit of area was determined. From these values the number of erythropoietic cells per unit of area was computed. This was not significantly changed in any group of rabbits. The histologic pattern of myelopoiesis was grossly altered by cadmium poisoning, and a mucoid type of connective tissue degeneration was seen. In the rabbits which had received only cadmium the bone marrow was very rich in cells, but administration of iron produced regression of this hypercellularity. In groups which were not injected with iron, the reticular marrow cells showed more stainable iron in the cadmium-poisoned rabbits than in the controls. Cadmium poisoning thus had caused hypochromic anemia without depletion, but rather increase, of the depots of iron in the bone marrow. The beneficial effect of parenteral iron in the intoxicated animals may therefore indicate that some form of inhibition in the transfer of iron to the hemoglobin-synthesizing cells is induced by cadmium.

-- Authors' summary

- 980 Comparative Toxicology of Iron Compounds. L. C. Weaver, et al.
Am. J. Med. Sci. 241, 296 (1961).

Studies performed in mice and dogs suggest that iron carbohydrate complex is less toxic than ferrous sulfate, ferrous gluconate, ferrous fumarate, ferroglycine sulfate complex, ferric choline citrate and iron polysaccharide complex by the oral and intraperitoneal routes. Intravenously, the iron polysaccharide complex was the least toxic and iron carbohydrate complex was next in order. Iron carbohydrate complex produced the least gastrointestinal irritation as indicated by emesis in the dog. Doses of iron carbohydrate complex equivalent to 1 g. elemental iron per day for a month failed to produce local irritation or systemic alterations in dogs. Reservations and caution are indicated in extrapolating these findings to humans.

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

- 981 Nickel in Cigarettes. F. W. Sunderman and F. W. Sunderman, Jr.
Am. J. Clin. Pathol. 35, 203-209 (1961).

The authors measured the nickel content of cigarettes. Six common American brands contained 1.59 to 3.07 micrograms per cigarette. Of the total nickel content, 20% was recovered from the main stream smoke. The amount of nickel that a heavy cigarette smoker inhales in a year is roughly 3 times the amount of inhaled nickel reported to be carcinogenic for the rat, an animal notably resistant to pulmonary cancer. In the light of these investigations, attempts should be made to remove nickel from tobacco smoke.

-- World Wide Absts. of General Med.

- 982 Treatment of Inorganic Mercury Poisoning with N-Acetyl-D, L-Penicillamine.
A. D. M. Smith and J. W. Miller. Lancet 1, 640-642 (March 25, 1961).

Rapid recovery followed treatment with this chelating agent which is therefore advocated for further trial in mercurialism. After 15 years work in a London factory where his predecessor had died from mercury poisoning with nephrosis and uremia, a hand-gilder, aged 56, developed classical chronic mercury poisoning when the articles to be gilded increased in number and size because of orders from new African states for various state insignia. The gilding was done twice each week by possibly the only hand-gilder in Britain. Exhaust from his charcoal fire was inadequate; the paste-like mercury-gold amalgam was handled and applied to the article which was heated and repeatedly brushed. Gross intention tremor of the hands for 3 months before admission did not result in the patient's giving up work, but did result in his breaking most of the household crockery. He was only slightly irritable. There was milder tremor of head and eyebrows and ataxia; dysphonia was demonstrated to be due to jerky vocal cord movement. Slit-lamp examination showed blue-gray mottling of the cornea and polychromatic luster of the post-lens capsule. Electroencephalograms showed a mild paroxysmal instability only, retained after treatment. All other investigations, including chromatography of urine for amino acids, were normal, except urinary

excretion of mercury. This before treatment was 1,369 micrograms daily and during three 10-day courses of treatment at 17 to 19-day intervals, it became: 1,828 and 1,639; 600 and 420; and finally 290 micrograms. The dose of N-acetyl-D, L-penicillamine was 250 mg. 4 times daily. Improvement after the second course permitted discharge, and there was almost complete recovery one month later.

-- Bull. Hyg.

- 983 A Rapid Procedure for Determination of Mercury in Urine and Kidney. E. J. Cafruny. J. Lab. Clin. Med. 57, 468-472 (Mar. 1961).

A rapid and simple procedure for the determination of mercury in urine and kidney tissue is described. Potassium bromide is used to liberate mercuric ion from organic complexes and renders unnecessary any of the laborious manipulations usually employed in preparing samples for analysis. Free mercuric ion is then extracted in chloroform solutions of dithizone. The colored mercury dithizonate complex formed can be determined spectrophotometrically. Results using this method are equivalent to those obtained with a polarographic procedure. Renal and urinary mercury concentrations after administration of therapeutic doses to rats and dogs are comparable to those reported in the literature. The method may be used to study excretion of mercury in patients treated or poisoned with organic mercurial diuretics or inorganic mercury. As little as 10 micrograms of mercury per milliliter of urine may be detected but, with minor changes, sensitivity can be adjusted for measurement of 1 microgram of mercury.

-- Bull. Hyg.

- 984 Endogenous Pyrogen in the Pathogenesis of Zinc Fume Fever. B. Pernis, et al. Med. lavoro 51, 579-586 (Oct. 1960).

In the present paper the hypothesis is advanced that metal fume fever is due to the direct action of zinc oxide fume on the endogenous pyrogen contained in the polymorphonuclear leukocytes. This hypothesis has been put forward because all the previous explanations of the pathogenesis of zinc fume fever are open to serious criticism because of the following experimental results: (1) Attacks of zinc fume fever can be elicited in rabbits by inhalation of diluted acetic acid aerosol followed by inhalation of zinc oxide fume. A rapid tolerance is induced by inhalation of zinc fume repeated for two or more consecutive days but not by pretreatment with bacterial endotoxins. (2) An immediate attack of fever can be elicited in normal rabbits by the transfusion of 10 ml. amounts of blood serum of rabbits with zinc fume fever. (3) Microscopic observation of lungs of rabbits with zinc oxide fume fever show an intensive filling of the capillaries with polymorphonuclear leukocytes. The conclusion is drawn that zinc fume does not act through the liberation of endotoxic lipopolysaccharides, but probably through a direct release from the leukocytes of an endogenous pyrogen which is demonstrable in the blood of rabbits, and that the contact between zinc fume and leukocytes in rabbits is facilitated by the accumulation of these cells in the lung capillaries due to the irritant action of acetic acid aerosol.

-- APCA Abst.

- 985 Methyl Chloride Intoxication. I. J. Mackie. Med. J. Australia 1, 203-205 (Feb. 11, 1961).

An unusual case of methyl chloride intoxication would very likely have been fatal had it not been for the administration of adrenal steroids. The patient, aged 40, had worked in his refrigerating plant for 18 years with methyl chloride which, he complained, had been marked "Non-Toxic". For 6 months the exposure had been heavy and, after good health except for recent impotence, during this time he became weak, thin and pale. He developed pyrexia, vomiting, muscle pains and jaundice; the urine was dark and the feces pale. Transient erythemia, revulsion for alcohol and smoking, headache, thirst and polyuria preceded admission to the hospital 6 weeks after jaundice started. Tachycardia, deep jaundice, profound pallor and enlargement of the liver and spleen were noted. The urine contained protein, bile pigments and salts and no abnormal metals. The blood contained 3.2 g. hemoglobin per 100 ml; the white cell count was raised with a leukemoid response; blood urea was raised; Schumm's

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test and liver function tests were positive. Tests for hydatid disease, syphilis and malaria were negative. Liver biopsy one month later showed necrosis with regeneration, mainly in the center of the lobules, and early reticulin formation, and 4 months later was normal. By this time, the only abnormality was a palpable liver. The patient was strong and well, though still taking a reduced dose of prednisone. Improvement had begun after this was given 2 days after admission when even slow transfusion of packed red cells rendered digitalization necessary.

-- Cond. from Bull. Hyg.

- 986 Accidental Vapor Exposure to Anesthetic Concentrations of a Solvent Containing Tetrachloroethylene. R. D. Stewart, et al. *Ind. Med. & Surg.* 30, 327-330 (Aug. 1961).

The clinical course of a worker accidentally overexposed to anesthetic concentrations of an industrial solvent containing tetrachloroethylene and Stoddard solvent is presented. While the duration of exposure was brief and apparent clinical recovery rapid, the tetrachloroethylene vapor concentration in the patient's expired air diminished exponentially over a 2-week period. Liver function studies became abnormal during the second and third postexposure weeks. This suggests that an acute exposure to this solvent has a chronic effect upon the liver and is capable of producing a mild hepatitis. Determination of the concentration of tetrachloroethylene in expired air at any time during the 2-week postexposure period would have demonstrated that overexposure had occurred. Thus, analysis of expired air offers a method whereby the magnitude of exposure may be reasonably estimated long after suspected overexposure has occurred. The use of infrared spectroscopy to analyze the expired air provided for absolute identification of tetrachloroethylene, and proved to be a sensitive, rapid method with which to measure the compound.

-- Authors' summary

- 987 Two Case-Notes of Poisoning by Methyl Sulfate. M. Gaultier, et al. *Arch. maladies profess.* 21, 744-746 (Dec. 1960). French.

Post-mortem analysis in one of these cases showed that the blood contained 0.17 g. ethanol, and 0.052 g. methanol, per liter; the viscera contained 0.4 and 0.06 g. per kg. respectively, and 0.01 g. acetaldehyde, and 0.375 g. sulfates, per kg. Though the post-mortem findings of purulent bronchitis, pulmonary congestion, atheroma and slight fatty degeneration of the liver were attributed to natural causes, it was concluded that the methanol found was consistent with hydrolysis of dimethyl sulfate from accidental exposure 12 hours before death. The blood sulfate was normal (0.75 g. per kg. in text) but the viscera contained more than generally found. This was the case of a man aged 69 with a past history of bronchial trouble, who became ill 5 hours after a 10-liter carboy of dimethyl sulfate was broken, with escape of 50-100 ml. He washed his skin but did not remove towels from the workroom and refused to stop work. Clothing was not splashed. He was admitted to the hospital 8 hours after the accident. His companion, aged 72, was admitted at the same time, having developed, as usual some hours after exposure to this irritant, symptoms of eye, nose, larynx and lung irritation. This man's course, investigations and treatment are described. He recovered a month later. The toxic effects outlined and the MAC of 1 ppm give emphasis to precautionary measures which especially are necessary in laboratories. Workers should be trained to leave the area if dimethyl sulfate escapes. Splashed clothing should be removed. An exposed person, after eye lavage, should be removed by ambulance, and bed rest for 3 days enforced. The difficult problem of treating pulmonary edema in the presence of hypertension is discussed and also the question of assisted respiration.

-- Bull. Hyg.

- 988 Investigation of the Effect of Toluene on the Blood Picture of Rotogravure Printers and Auxiliary Workers. W. Bänfer. *Zentr. Arbeitsmed. u. Arbeitsschutz* 11, 35-40 (Feb. 1961). German.

Benzene, toluene and xylene have been widely used in color printing on account of their speed of evaporation and good solvent capacity, but benzene, the best technically in these respects, has, owing to its hemotoxic action, been generally replaced by toluene and xylene. Commercial toluene and xylene contain a certain amount of benzene (up to 15% for toluene) but pure preparations of both are now available. The present investigation on toluene containing

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only 0.3% benzene included blood examinations of a large number of workers employed for more than 3 years in rotogravure printing. They were carried out every 3 months in young persons under 18, and every 6 months in adults, and included enumerations of erythrocytes, total leucocytes, polymorphonuclear leucocytes, and estimation of hemoglobin. Analysis of the air of the workroom revealed no benzene or xylene. In 3 samples the toluene content was less than the MAC, in one equal to it and in one reached 400 ppm. Results of blood examinations showed that only 3 times in all was the total white count less than 4,000, the polymorphs were never lower than 2,000, and there was no absolute or relative lymphocytosis. The red cells and hemoglobin showed only slight occasional variations. Sternal puncture of 5 workers with a total white count of less than 5,000 showed no pathological changes. Comparison with control workers having at the time no contact with toluene showed a very similar blood picture. It is concluded that though it is not possible, without a much longer and more exact investigation, to state categorically that pure toluene cannot have any injurious effect on the hemopoietic system, it has certainly a much less toxic effect than benzene.

-- Cond. from Bull. Hyg.

- 989 Poisonings by the Insecticide--Phosphene (Phosdrin; Carbomethoxymethylvinyl dimethyl Phosphate). L. Roche, et al. Arch. maladies profess. 22, 52-55 (Jan.-Feb. 1961). French.

This paper presents 4 case reports of poisoning in workers exposed to the organic phosphorus compound "Phosphene" (Phosdrin) which is being used as a general insecticide in market gardens. All patients recovered in a few days having been treated mainly by the administration of atropine. The main symptoms among these patients were: faintness, fainting fits, giddiness, misty vision, pronounced sweating, nausea, vomiting, diarrhea and shortness of breath with pains in the chest in one or two instances. Some of these symptoms began either during work or 1 to 2 days after exposure. Signs noted were pallor, cold extremities, moderate bradycardia and miosis (in 1 or 2 cases). In all patients it was noted that the breath had a marked aroma of phosphorus. Particulars of the blood examinations are given and cholinesterase estimations carried out in 3 of the 4 cases showed a considerable diminution in concentration. It is recommended that Phosdrin and other organic phosphorus insecticides which are not at present recognized by the law concerning industrial illness should be included in the official list for purposes of compensation.

-- Bull. Hyg.

- 990 Percutaneous Absorption of Parathion and Paraoxon. (4) Decontamination of Human Skin from Parathion. T. Fredriksson. Arch. Environmental Health 3, 185-188 (Aug. 1961).

An investigation has been made of the efficiency of a decontamination procedure in removing P-32-labeled parathion (E 605, diethyl 4-nitrophenyl thionophosphate) from the skin surface of human volunteers. Two series of experiments were performed, the material being left on the skin for 30 and 300 minutes, respectively. The radioactivity was determined before and after the cleansing procedure, and the residue calculated as percentage of the initial count after subtraction of the background count. In the long-term group, ordinary washing with soap and water for 30 seconds left a residue of about 30% to 50%, while the residue amounted to 8% to 20% in the short-term experiment. An alcohol wash immediately after the initial cleansing still left a considerable residue—more than 10% in the 300-minute series and approximately 5% in the other series. A final cleansing with soap and water left a residue of more than 5% in the long-term series, while in the other series, the skin was almost completely decontaminated. The theoretical aspects of the time factor involved have been discussed, and the practical implications within the field of occupational medicine have been stressed.

-- Author's summary

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INDUSTRIAL DUSTS

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- 991 Pneumoconiosis Due to Tin. L. Dérobert, et al.
Arch. maladies profess. 21, 713-718 (Dec. 1960). French.

On resuming work after an acute respiratory illness, a workman was submitted to radiographic examination of the chest. The x-ray revealed a generalized miliary nodulation of the lungs. This finding appeared anomalous as a variety of tests proved that the workman was in excellent health. On inquiry it was discovered that for the previous 11 years he had been employed at a small factory in the production of tin oxide. The atmospheric conditions were described as very dusty and on occasion he had suffered slight shortness of breath on exertion. Arrangements were made for the x-ray examination of his 5 workmates and this revealed 3 similar cases of micronodulation of the lungs. Three former employees were traced but only one was alive and his lungs showed the same x-ray changes. The authors then made a study of the literature on the effects of the inhalation of tin dust. They also carried out an experimental study by "dusting" guinea pigs. As a result of all the investigations it was concluded that the inhalation of tin results in a benign pneumoconiosis, characterized radiographically by dense micronodulation of the lungs but causing no impairment of pulmonary capacity. Two other features are mentioned, a grayish metallic tinge of the sputum and bradycardia.

-- Cond. from Bull. Hyg.

- 992 Q Fever. W. H. Gallaher. J. Am. Med. Assn. 177, 187-189 (July 22, 1961).

A case of serologically proved Q fever with chronic hepatitis and central nervous system abnormalities simulating Parkinson's Disease has been presented. The protean nature of this disease has been discussed. The spectrum of clinical manifestations hitherto reported in association with Q fever includes: pneumonia, hepatitis, pericarditis, meningitis, esophagitis, arthritis, orchitis, epididymitis, phlebitis, and arteritis. Epidemiologic studies indicate that the disease is prevalent throughout the world, yet in many areas the diagnosis is rarely made. It is possible that Q fever may be overlooked while masquerading as more widely recognized illnesses, such as viral infectious hepatitis. Recent studies indicate that the incidence of bovine Q fever is increasing in the United States, and human infection may become an increasing public health problem.

-- Author's summary

- 993 How Dust Filter Selection Depends on Electrostatics. E. R. Frederick. Chem. Eng. 68, 107-114 (June 26, 1961). (Reprints available from Industrial Hygiene Foundation upon request.

Parameters have been established which affect the selection of filters for dust collection and point up the fact that the electrostatic properties of both the dust and the collecting fabric are extremely critical in dictating filtration performance. Results show that the electrostatic requirements of the fabric are dictated by the electrostatic activity and certain other physical properties of the collected dust. While the triboelectric polarity and charge dissipation properties of fabric filter media are rapidly estimated, these same properties are not so easily measured for dusts. Each production fabric, regardless of its apparent similarity to another material already located in the triboelectric series, must itself be evaluated to find its own series position. The method of determining the triboelectric position and the charge dissipation rate of dust collection fabrics is quite simple. A table shows three main dust classifications, (which) separates the two electrostatically active classes I and II from the inactive class III. Of at least 40 different commercial dusts that were examined only two have demonstrated little or no electrostatic activity.

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IN RE: AIR AMIS November 1992

- 994 Counting of Atmospheric Dusts using Millipore Filters. N. Zurlo.
Med. lavoro 51, 660-671 (Nov. 1960).

Difficulties in dust measurement with millipore filters include the poor visibility of small particles which is due to the refractive index of the liquid used to render the filter transparent being near to that of the dust, the gradual relapsing of the filter to opacity, and the penetration of particles deeply into the filter if too much suction is employed. A procedure is described which avoids errors due to such causes and gives results agreeing with those given by the thermal precipitator. The membranes were steeped in a mixture of methyl cellosolve and butyl alcohol for microscope counting which enabled particles of transparent minerals as small as 0.5 micron to be dealt with; transparency was retained for over 50 hours. A special reversible mercury-displacement aspirator is described for use with the filters which sucks 100 cc. of air in a minute or two, depending on the grade of millipore, at a nearly constant flow rate. After the mercury has run from the upper into the lower reservoir, the apparatus is inverted and is ready for use again. Rubber diaphragm valves automatically apply suction and release air displaced from the lower reservoir. -- Bull. Hyg.

- 995 Studies of Experimental Silicosis in Dogs. M. Mosinger, et al.
Arch. maladies profess. 22, 5-39 (Jan.-Feb. 1961). French.

Experimental studies of silicosis in the laboratory have largely been carried out in small animals such as rats, guinea pigs, hamsters and mice. While for certain observations, pathological and epidemiological, these animals have advantages, their size considerably restricts the range of investigations. The author and his colleagues decided to use dogs for their experiments. Under intravenous anesthesia, suspensions of powdered quartz (size under 3 microns) in isotonic serum were injected into the lungs or selected lobes of these through a bronchoscope. Thirty-four dogs (breeds not indicated) were given single or multiple doses at intervals. The survivors were observed over periods from 9 to 32 months. The investigations comprised clinical, radiological (including tomography and bronchography) metabolic, biochemical, morbid anatomical and surgical excision. Results are described very fully under these headings and illustrated by photographs of specimens and photomicrographs. It emerges that the features of the disease in the dog approximate closely to those observed in man. The onset of emphysema, it is remarked, is precocious. The authors submit that their findings prove that silicosis affects not merely the lungs and hilum glands but also other organs, and that the accompanying biochemical changes signify systemic changes. Finally, the merits of the dog for experimental work in pneumoconiosis are emphasized. -- Bull. Hyg.

- 996 Bronchitis, Bronchiolitis and Silicosis. F. Nager, F. Zenger and J. R. Rüttner.
Schweiz. med. Wochschr. 90, 1357-1364 (Nov. 26, 1960). German.

The various views on the relationship between bronchitis and silicosis are discussed in the first part of this paper under the headings of statistical investigation, investigation by bronchoscopy, experimental research and pathological investigation. The authors' contribution falls in the last category. They investigated histologically 100 lungs from 36 subjects with classical silicosis, 17 from subjects exposed to mixed dust and 47 from subjects with silicotuberculosis. These were compared with 30 lungs of patients dying of primarily non-pulmonary conditions, where the patients had been bedfast with stasis of the lungs. Twenty lungs from subjects with bronchitis and emphysema were also used as controls. The result of the investigation was that there was considerably inflammatory change in the bronchi and bronchioles in all stages of silicosis. These changes were not found or were not so definite in the controls. In the bronchi of the silicotic lungs there was a lymphoplasmacellular infiltration, there were signs of hypersecretion, atrophy of the elastic tissue and later of the muscular tissue, sometimes bronchostenosis and bronchiectasis. The cilia were intact. In the bronchioles, the conditions were more marked. The silicotuberculosis cases showed the same changes in areas away from tuberculous foci. The changes were found in all stages. The bronchiolitis and bronchiolectasis were essentially dependent on dust. With increasing severity of the silicosis the bronchial and bronchiolar changes were more definite. The fact that many severe cases of silicosis present no clinical evidence of bronchitis is to be explained by the fact that the bronchitis is "hidden" by the silicotic masses. -- Cond. from Bull. Hyg.

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- 997 Asbestosis in a Worker Engaged in Automobile Undercoating. H. G. Brugsch and H. Bawley. New Engl. J. Med. 265, 379-381 (Aug. 24, 1961).

The material that the patient used contained asbestos of various fiber sizes in an asphalt base and was held in a mastic form by a solvent of the petroleum-distillate type. Lung biopsy revealed the presence of asbestos bodies of characteristic appearance. The unusual finding in this case was the presence of numerous amorphous bluish-staining deposits fairly widely dispersed throughout the specimen and surrounded by inflammatory and connective-tissue reaction. The x-ray appearance of finely granular infiltration throughout both lower lobes and the possibility that the sputum also contained asbestos bodies ("yeastlike bodies") indicate that the lung process in this man was of a chronic nature consistent with pneumoconiosis and the direct local action of foreign material such as asphalt and asbestosis. This is also suggested by some of the air tests obtained in the survey. The cross-sectional survey here reported indicates that under prevailing methods of operation, the use of an asbestos-base undercoating, when limited to short exposures, has not resulted in an occupational hazard. However, if this operation is performed continuously without adequate ventilation and protective respiratory equipment it may expose the worker to the potential danger of pneumoconiosis. As a protective measure, it is recommended that workers using asbestos-base undercoating material over a period of 10 hours weekly or more for periods longer than one year should observe the following rules: pre-employment and periodic x-ray studies of the chest, with the use of large-sized films (14 x 17 inches) should be made. When possible the workers should be rotated. Approved respiratory devices, with additional protection for the eyes, should be worn. Mechanical ventilation should be provided in the immediate vicinity of the work area.

- 998 Studies on the Chemical Properties of Chrysotile in Relation to Asbestosis. S. G. Clark and P. F. Holt. Ann. Occ. Hyg. (London) 3, 22-29 (Jan. 1961).

There are two rival hypotheses, mechanical and chemical, of the pathogenesis of asbestosis. According to the chemical hypothesis the fibrosis of the lungs is due to the action of silicic acid derived from the decomposition of asbestos in the lungs. The present report describes studies made at the University of Reading, England. The experiments were made in vitro and the aim was to discover the rate of dissolution of South African chrysotile asbestos at temperatures between 25° and 90°C in neutral, acid and alkaline media. The media used were respectively water, 0.1 N hydrochloric acid and 0.1 N sodium hydroxide. The analyses of the extracts at various intervals of time are tabulated. It was observed that the dissolution resulted in the removal of magnesium and "the release of minute, two-dimensional flakes of the silica lattice". From this it is deduced that a reaction similar to that normally evoked by fine silica particles would follow. Dissolution, it was observed, occurred more readily with alternating acid and alkaline conditions than under the influence of acid or alkali alone. Such an alteration of acid and alkaline states occurs in inflammatory diseases including pneumonia and bronchitis. The authors conclude that if the breakdown of chrysotile follows the same course in vivo as it does in vitro, a pneumoconiosis having a general resemblance to silicosis would be expected. -- Cond. from Bull. Hyg.

- 999 The Changes in the Bronchial Tree in Asbestosis. G. Jacob and H. Bohlig. Arch. Gewerbepathol. Gewerbehyg. 18, 247-257 (1960). German.

This bronchographic study of various stages of asbestosis has been facilitated by the use of a new contrast medium—propyliodon. In asbestosis with thickening of the pleura the small bronchi towards the base are bunched together with their ends turned back. This was described by Jacob as the "broom phenomenon" and is associated with displacement of the basal segments of the lung. This is not pathognomonic for asbestosis since it occurs in other conditions causing pleural thickening. In all cases the conditions grouped under the term "bronchitis deformans" are to be found. The distension of the bronchi expected from the character of the disease is evident but bronchiectasis is not so striking as in silicosis even in advanced asbestosis and it is cylindrical in type. In contrast to silicosis, there is no stenosis of the large bronchi. In asbestosis as a rule the lower and middle lobes, and in the left lung the lingula are affected, and in silicosis the upper lobe. In these lobes the bronchi are

bunched while in the other lobes they are spread out. In asbestosis the normal appearance of the bronchus next to the hilus can be seen but this is not so in silicosis where there is an increase of the lung roots and obliteration of the lymph apparatus. The swelling of the roots may be so massive that many authors believe that silicotic patients with carcinoma of the lung have a greater expectation of life because of the closure of the way for metastasis. This very questionable assurance is not granted to the asbestosis patient. -- Cond. from Bull. Hyg.

- 1000 Influence of Cement Kiln Dust on Plants and Animals. H. Pajenkamp. Zement-Kalk-Gips 50, 88-95 (Mar. 1961). German. (Zement-Kalk-Gips, Bauverlag G.m.b.H., Kleine Wilhelmstr. 7, Wiesbaden, Germany*).

The so-called cement dust in the vicinity of cement works is not cement but consists essentially of very finely ground limestone powder and is, as such, a constituent of an intermediate product in the cement manufacturing process. It is therefore, more correctly called cement kiln dust. Since it is continually alleged by agriculturalists that this cement kiln dust is harmful to plants and animals, in recent years numerous scientific investigations on the effects of dust have been carried out with a view to testing the validity of these allegations. Among the studies noted is one at the Pathological Institute of the Veterinary Medical School at Hanover. High doses of dust (2.5 to 11 g./day/animal during a 60-day period in 1957) administered on the fodder of food, did not show any clinically ascertainable injury to, or harmful effects to the general condition of, a group of experimental animals (2 cows, 17 sheep, and 16 dogs). Field tests conducted during the growing seasons of 1958 and 1959 at the Agricultural Chemical Institute in Göttingen, indicated that even considerable quantities of dust brought about no harmful effects and no other lasting effects on growth or crop yield of several different plants. Those studied were oats, rye, grass, red clover, and turnips. The dust had a content of about 29.3% limestone (analyzed as CaO), and 3.1% K₂O. It was applied at levels of 0.75 g./m.²/day; 1.5g./m.²/day; 1.5 g. for 10 days with a pause of 10 days and then reapplied; 2.25 g. for 10 days with a pause of 20 days. -- APCA Absts.

- 1001 Experimental Study of the Toxic Action of Dust in the Production of Sinter-(Hard)-Metals. Z. S. Kaplun and N. W. Mezencewa. J. Hyg. Epidemiol. Microbiol. Immunol. (Prague) 4, 390-399 (1960). German.

Hard metals or sinter metals are made from a mixture of tungsten and titanium carbides amalgamated with cobalt. In the process of manufacturing these metals the most dusty processes are the mixing of the metallic tungsten with carbon, the heating and sieving of cobalt oxide, and the sieving, granulating and grinding of the mixture of metals. From the periodical examinations of 283 workers in these dusty places it was found that those who came into contact only with tungsten and its combinations showed slight changes in the respiratory organs. Workers exposed to mixtures of tungsten and cobalt complained of poor appetite, cough, and loss of the sense of smell. This paper gives the results of several series of experiments on white rats to ascertain the effects of the individual constituents of the dust. First tungsten carbide, metallic tungsten, tungsten oxide and titanium carbide were used. Animals were exposed to these dusts either in a dust chamber or by intratracheal injection. All the dusts produced in the lungs a proliferation of lymphoid-histocytic elements about the bronchi and larger vessels. Tungsten oxide give the most distinct changes. A separate experiment was made with metallic cobalt. Very definite changes were found in the blood vessels and the walls of the bronchi showed inflammatory changes. Experiments with cobalt oxide showed that it had no distinct general action but it could produce more pronounced changes in the lungs than metallic cobalt. -- Cond. from Bull. Hyg.

* Address not in current List of Periodicals.

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 1002 Medical Problems of Underwater Depths. F. C. MacIntosh.
Can. Med. Assn. J. 85, 424-428 (Aug. 19, 1961).

The physical and physiological hazards associated with the use of diving gear are enumerated and briefly discussed. Some of these hazards increase with increasing depth, while others are present even in shallow dives. Canada needs, for maximum safety of both professional and amateur divers, more widespread facilities for therapeutic recompression and a greater interest in the problems of diving on the part of the medical profession. Mention is also made of the toxicological and other hazards which must be considered and eliminated in the design of modern submarines.

-- Author's summary

- 1003 Pulmonary Edema of High Altitude. V. Alzamora-Castro, G. Garrido-Lecca and G. Battilana. *Am. J. Cardiol.* 7, 769 (June 1961).

Observations on 27 patients with pulmonary edema of high altitude are reported. Most of the patients were men, who had been born at high altitudes, 19 being Peruvians. The majority were young and free from heart disease. Several patients were symptom-free in previous and subsequent trips to the same altitude. The disease was often observed in normal subjects adapted to the altitude, who were going back to the highlands after spending a variable length of time at sea level. In most patients, pulmonary edema began with mild dyspnea, headache, palpitation, nausea and nonproductive cough shortly after arrival at high altitudes. In some, the clinical picture began after physical effort, excitement or a heavy meal. Dyspnea disappeared spontaneously 1 or 2 hours in some patients, but in most cases symptoms were progressive and gradually became critical. In severe cases the clinical picture resembled cardiac asthma or acute left ventricular failure: dyspnea was intense, pulmonary rales were heard at a distance. Patients were anxious, pale or cyanotic, the skin wet, and, for the first hours, the sputum was often abundant and bloody, later becoming salmon-colored. Three patients died. Knowledge of the premonitory symptoms is important to prevent death. The treatment of choice is oxygen or, when possible, descent to lower altitudes.

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

- 1004 Measurement of Noise. L. S. Goodfriend. *Noise Control* 7, 4-12 (Mar.-Apr. 1961).

This review paper summarizes the essential requirements and performance characteristics in most types of noise measurement equipment. The environmental conditions under which measurements are made and an appreciation for the characteristics of the noise being measured are also discussed. Decibel notations and use of units in sound measurements are reviewed.

-- Author's abst.

- 1005 Instrumentation for Measurement of Sonic Boom. H. H. Taniguchi.
Noise Control 7, 43-45 (Mar.-Apr. 1961).

From the Fourier analysis of an N-shaped signature of a sonic boom pressure-time signal, the author derives the frequency and amplitude distribution of the signal, and sets up performance criteria for a transducer and recording system capable of measuring typical sonic boom pressure pulses.

-- Author's abst.

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- 1006 Measurement of Rocket Engine Noise. D. N. Keast.
Noise Control 7, 25-36 (Mar.-Apr. 1961).

This paper presents a general approach to the measurement and analysis of rocket engine noise and illustrates this approach with examples of problems which have been encountered in the past. The approach suggested is intended to provide not only the desired data, but also sufficient information about the instrumentation and measurement techniques that possible sources of error in the data may be evaluated. The procedures include a detailed laboratory evaluation of the transducer systems, evaluation and calibration of the complete data-acquisition system installed at the test site, various steps in the processing and analysis of tape-recorded data, the eventual estimation of the causes and magnitudes of errors in the measurements, and methods for reducing the possibility of human error by measurement personnel.

-- Author's abst.

- 1007 Cruise Flight Noise Levels in a Turbojet Transport Airplane. D. E. Bishop.
Noise Control 7, 37-42 (Mar.-Apr. 1961).

Analysis of noise measurements taken inside the fuselage of a turbojet transport airplane show boundary-layer excitation of fuselage surfaces to be the major source of noise inside the cabin at high-speed cruise conditions. Changes in noise are correlated with changes in flight conditions through reference to a generalized boundary-layer noise spectrum, derived from flight measurements.

-- Author's abst.

- 1008 On the Determination of the Acoustic Power of a Source of Sound in Semi-Reverberant Spaces. R. J. Wells and F. M. Wiener. Noise Control 7, 21-29 (Jan.-Feb. 1961).

After discussing briefly the determination of acoustic power levels in reverberation chambers and anechoic rooms, the authors show that it is possible to determine acoustic power levels of small sources in ordinary (semi-reverberant) spaces with engineering accuracy. There is reason to believe that these results can frequently be extended to large sources as well.

-- Authors' abst.

- 1009 Simulated, Combined Vibration, Sustained Acceleration, and Extreme Temperature Environments. N. Granick and E. A. Toole. Noise Control 7, 5-10 (Jan.-Feb. 1961).

The authors stress the need for environmental tests to incorporate several of the test parameters in combination. A testing facility is described that includes provision for simultaneous combined tests involving sustained acceleration, vibration and temperature extremes. A valve mechanism is used to illustrate the complexities of such combination tests and the resulting simplifications that may be made to reduce the test time without unduly sacrificing the test results.

-- Authors' abst.

- 1010 A Study of the Effects of Loud Sound on Tinnitus. G. F. Reed and M. A. Christian. Laryngoscope 71, 167 (Feb. 1961). (Laryngoscope Company, 640 S. Kings Highway, St. Louis 10, Missouri*).

According to anecdotal reports, chronic tinnitus has sometimes been relieved temporarily and even permanently by exposure to high-intensity noise. This experiment was designed to determine more scientifically what effects on tinnitus could be produced by treatment with high-intensity sound and what portion of these effects are due merely to suggestibility of the patients. A group of 100 patients was divided into 2 groups matched in age, sex, duration and character of tinnitus, and neuroticism. The experimental group was exposed on three occasions for 10 minutes each to a pure tone near the tinnitus frequency at

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120 db or higher. The control group went through the same procedure but with no acoustic stimulation (they were told that the exposure involved a tone too high in pitch to hear). It was found that the tonal exposure could either alleviate (in 25 of the 50 cases) or intensify (in 13) the tinnitus, but in either case the effect was only temporary. Although fewer changes in tinnitus were reported by the control group (better in 11 cases, worse in 4), these numbers are high enough to indicate the importance of suggestion. Strangely, neuroticism seemed to be irrelevant. The authors conclude that, if there were some way to control the psychological influence of intense sound, the paradoxical effect might well be shown to be due entirely to suggestion.

-- J. Occ. Med. Absts.

- 1011 Quieting the Air Conditioning Equipment for a Large Hotel Ballroom. L. S. Goodfriend and P. B. Ostergaard. *Noise Control* 7, 22-24 (Mar.-Apr. 1961).

The requirement that the main fan-coil unit for the ballroom for the Hotel Pierre in New York City be located within the ballroom ceiling presented a type of air conditioning noise problem not detailed in the available publications on heating and ventilating noise. Specifications for the fan-coil unit were prepared, and the unit was tested at the factory and evaluated in place prior to installation of the ceiling. Noise control techniques applied result in a noise level below NC35 throughout the entire ballroom with the exception of a few points close to diffusers. However, noise in the third octave band, typically a problem, is unnoticeable directly below the machine.

-- Authors' abst.

- 1012 Antivibration Foundation for Roll Grinding Machine. P. H. Allaway. *Noise Control* 7, 30-32 (Jan.-Feb. 1961).

The vibration isolation requirements are described for a large roll grinding machine installation. The mounting arrangement and some of the construction procedures are summarized and illustrated.

-- Author's abst.

- 1013 The Problems Associated with Fine and Other Visually Different Concentrated Tasks in Industry. C. H. Bedwell. *Ann. Occ. Hyg. (London)* 3, 84-93 (Feb. 1961).

This is an excellent scientific and technical paper on visual problems in industry. Problems associated with fine work have become more apparent in recent years because in some industries, for example electronics, there has been a strong tendency towards more and more miniaturization and finer limits. Yet because of normal competitive conditions, the actual operation time must often be less than when the task was larger. The resulting visual difficulties and their practical solution are discussed and described. The main factors concerned in a seeing task are reviewed with references to relevant research under the headings: I. Task analysis—(1) size and visual acuity and (2) illumination, visual acuity and performance; II. The design of the visual field for efficiency and comfort—(1) lighting and color and (2) the avoidance of glare; and III. The eyes at work—(1) eye strain during concentrated vision, (2) the recording of eye movements, (3) prescribing for seeing fine tasks, and (4) the use of magnifying aids. There are a number of very good photographs to illustrate the devices of lighting and magnification which are of value in different types of fine work and also of electro-oculograph and photographic equipment which has been developed for the scientific study of eye movements.

-- Bull. Hyg.

- 1014 Some Aspects of Nasal Function and Dysfunction in Relation to Environmental Air. R. Hinchcliffe. *Ann. Occ. Hyg. (London)* 3, 6-21 (Jan. 1961).

This paper was delivered at a joint meeting of the British Occupational Hygiene Society and the Ergonomics Research Society held in London, June 24, 1960. The author reviewed the present state of knowledge of nasal dysfunctions related to environmental air conditions. Methods of investigating nose-environmental air relationship were discussed under three main headings: (1) Animal experiments; (2) Human physiological experiments.

the climatic room; and (3) Epidemiological investigations: (a) in respect to air conditioning, and (b) in respect to different climatic areas (geographical). It is concluded that the precise importance of environmental air conditions in the pathogenesis of nasal dysfunction and their influence on the prevalence of nasal disease has yet to be elucidated. Available evidence, however, indicates that artificial climates, in the sense of air conditioning of offices or factories, do not influence the prevalence or attack rate of the upper respiratory or other diseases. It would seem that further inquiries into the relationship between nasal dysfunction and environmental air conditions must primarily take the form of epidemiological investigations. Feasibility studies conducted by the author indicate that such investigations are possible using radiographic methods. For future surveys in this field, the author stresses the value of the epidemiological method and he favors the respiratory tract approach. This signifies that sinusitis investigations should be combined with bronchitis surveys.

-- Cond. from Bull. Hyg.

RADIOACTIVITY AND X-RADIATION

- 1015 Tumors of the Liver Following Administration of Thorotrast. E. E. Suckow, G. C. Henegar and R. Baserga. *Am. J. Pathol.* 38, 663 (June 1961).

The authors report on a 39-year-old man with carcinoma of the hepatic bile duct after administration of thorium dioxide suspension (Thorotrast). This contrast medium had been given by intravenous injection 15 years earlier to establish the diagnosis of an amebic liver abscess. The patient's chief complaints were abdominal pain and headache. An abdominal laparotomy was performed, a liver biopsy was carried out, and a histological diagnosis of adenocarcinoma of the liver was made from the biopsy specimen. The patient died 5 days after the operation, and autopsy revealed bile duct carcinoma with extensive necrosis, hemorrhage and fibrosis. The connective tissue in the portal areas was markedly increased, and there were numerous macrophages filled with Thorotrast granules. Macrophages containing Thorotrast were observed in spleen and testes. The discrepancy between the concentration of thorium and site of origin of induced tumors is discussed with regard to dose-response curve, minimum tissue damage required for tumor induction, and number of cells at risk within range of alpha rays. This last factor seems most important for thorium-induced cancer.

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

- 1016 Short Wave Electromagnetic Radiation as a Hazard to Personnel. D. E. Goldman. NP-9992. Lecture and Review Series No. 60-6. (Naval Research Institute, Bethesda, Md.) 8pp. (Sept. 17, 1960). Obtainable from: Office of Technical Services, U. S. Department of Commerce, Washington 25, D.C.

The radiation hazards of short-wave electromagnetic radiation are discussed. It is pointed out that electromagnetic radiation produces electrical and magnetic forces and generates heat upon contact with biological systems. Reactions are induced which are potentially dangerous to animals. Reported cases of eye damage and other serious injuries to personnel working with high powered radar generators are discussed. Results are reported from studies with monkeys in which a number of neurological disturbances were induced by exposure to radio frequencies in the 300 to 400 Mc range. Results of other animal studies are discussed briefly, and reaction mechanisms involved in the biological effects of primary radiations in the range 100 to 30,000 Mc are summarized. Data are tabulated from measurements of the conductivity and dielectric constant of skin; the dielectric constant of selected tissues; the per cent energy absorption by whole rats, rabbits, and dogs; and the cooling time constant for mice, rats, rabbits, dogs, and humans exposed to radiations in this energy range. Data are also included on the heat input and output of the body at various temperatures under steady state conditions.

-- Nuclear Sci. Absts.

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- 1017 Microwave Radiation of 10 mw/cm² and Factors that Influence Biological Effects at Various Power Densities. W. B. Deichmann and F. H. Stephens. Ind. Med. & Surg. 30, 221-228 (June 1961).

In 1953, Schwan recommended that microwave radiation of 10 mw/cm² be accepted as a tolerance dose. In 1956, the U. S. Air Force disseminated this level to interested agencies. Experimental microwave studies have demonstrated that a number of factors must be closely controlled in order to obtain reproducible results with experimental animals. These same factors can be expected to modify significantly what may be considered under certain conditions, a safe exposure level. They include: (1) the frequency or wave length of the generating equipment; (2) the period of time of exposure in hours, minutes, or seconds; (3) irradiation cycle rate, referring to the individual ON-OFF periods during a unit time interval (a minute), when total time of irradiation per minute is kept constant; (4) air currents; (5) environmental temperature; (6) body weight, type or mass, and covering in relation to the exposed area; (7) orientation or position of an individual influencing resonant conditions and standing waves; (8) differences in sensitivity of organs and tissues; and (9) effect of reflections.

-- Authors' summary

- 1018 Radiation Protection. S. Warren. New Engl. J. Med. 264, 705-711 (Apr. 1961).

The biological effects of exposure to radiation from various sources are reviewed. It is pointed out that varying needs make it desirable that different standards of protection against radiation be applied to several categories of the population. These groups are listed as patients receiving radiation therapy or exposed to diagnostic x-rays, workers using or exposed to ionizing radiation, and the general population. Procedures for radiation protection at all exposure levels are reviewed.

-- Nuclear Sci. Absts.

- 1019 Protection Against Chemical and Biological Agents and Radiological Fallout. NP-9899. (Corps of Engineers) 72 pp. (Jan. 19, 1961). (EM-1110-345-461). Obtainable from: Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

Fundamental principles and criteria are presented for use in the design of structures for the protection of occupants against toxicological airborne contamination. Protection from chemical and biological agents and radiological fallout are considered. Protective considerations, operational considerations, and factors affecting occupancy are reviewed. Design criteria are included for entrances, personnel decontamination facilities, air filter units, ventilation systems and warning devices. Shielding fundamentals are discussed and the effectiveness of various structural materials as shielding against radiation is evaluated. Procedures for data evaluation and analysis are included, and correction factors are tabulated.

-- Nuclear Sci. Absts.

- 1020 Fallout and Man's Diet. E. R. Mercer and F. B. Ellis. Dairy Sci. Absts. 23, 1-6 (Jan. 1961). (Dairy Science Abstracts, Commonwealth Agricultural Bureaux, Farnham Royal, Slough, England*).

This is a review concerned with Sr-90 in man's diet. The reasons for the selection of milk and cream as representative foods in making a survey of Sr-90 in human diets are presented. The importance of differentiating radioactive strontiums and a procedure for analysis is given. The relationship between strontium and calcium in plant and human nutrition and in milk production is reviewed. Direct contamination of vegetation rather than uptake from soil appears to be the predominant source of Sr-90 in man's food. The high level of Sr-90 in milk and milk products is attributed mainly to fallout; the relationship between soil, plant and food contamination is presented.

-- Public Health Eng. Absts.

* Address not in current List of Periodicals.

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ENVIRONMENTAL MEASUREMENTS

- 1021 The Relationship Between Peak and Mean Concentrations. I. A. Singer.
J. Air Poll. Control Assn. 11, 336-341 (July 1961).

In most municipal air pollution surveys, the method of predicting average concentration levels for various meteorological conditions is well understood. However, the many aspects of predicting short-period fluctuations of concentrations are relative unknowns. The main purpose of this paper is to show the manner in which mean concentration patterns are built up from many short-term peak conditions and that a definable relationship exists between the peaks and the mean. A method of predicting average concentrations has been presented. It has been shown that the simplified normal bivariate distribution describing the average concentration pattern is composed of various short-term periodic distributions which may differ from it significantly. A descriptive, empirical method has been described which indicates an exponential relationship exists between these shorter time or peak concentrations and average conditions. The slope of the exponent appears to be proportional to the stability or the gustiness. Downwind, the peaks are normally within an order of magnitude greater than average concentrations, whereas crosswind, the peaks may be several orders of magnitude larger.

- 1022 Time Exposure Photography of Smoke Plumes. W. M. Culkowski. ORO-359. (Weather Bureau, Oak Ridge, Tenn.) 20 pp. (1961). Obtainable from: Office of Technical Services, U. S. Department of Commerce, Washington 25, D.C.

Techniques are described for making long-time exposure photographs of smoke plumes for use in studies on atmospheric diffusion and air pollution. Exposures were made over periods of time extending up to 9 hours. Ten photographs illustrate the methods used.
-- Nuclear Sci. Absts.

- 1023 Flame Ionization Analyzer for Hydrocarbon Detection. W. B. Innes and A. J. Andreach.
Ind. Water & Wastes 5, 185-191 (Nov.-Dec. 1960).

The methods for applying the analyzer to auto exhaust and afterburner testing, to air analysis, water systems, the various means of sample injection, equipment calibration, and the adsorbers which can be used profitably, are discussed. The flame ionization unit is ideal for determining true total hydrocarbon content as well as for rapidly and directly determining individual hydrocarbons or saturates and unsaturates with the aid of a suitable chromatographic column and adsorbants. The test set-up developed primarily for work on catalysts for oxidation of hydrocarbons in exhaust gas is illustrated in the article. -- APCA absts.

PREVENTIVE ENGINEERING

- 1024 The Purification of Coke Oven Gases with Platinum Metals Catalysts. H. C. Andersen and D. R. Steele. Brit. Chem. Eng. 5, 864-865 (Dec. 1960).

Methods have been developed for removing acetylene from coke oven and similar gases by means of hydrogenation over platinum metals catalysts. This type of catalyst will

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also remove nitric oxide, diolefins, and carbonyl sulfide. Temperature and space velocities are generally more favorable than those necessary for nitrogen oxides and acetylene removal with sulfide catalysts. Catalysts in this study consist of platinum group metals supported on 1/8 inch cylindrical pellets. There is a degree of specificity of catalyst with respect to the individual purification reaction, and the preferred catalyst metals. Impurity to be removed and preferred catalysts are shown.

-- APCA Abstr.

- 1025 Control of Dust Produced during the Sintering of Dolomite and in Grinding Operations. G. Barghini. Riv. ital. igiene 20, 380-394 (Sept.-Oct. 1960). Italian. (Rivista italiana d'igiene, Casa Editrice Nistri-Lischi, Piazza Castelletto, Pisa, Italy*).

In the course of the sintering of dolomite dense concentrations of dust which polluted the atmosphere in the neighborhood of the works at Torano in Carrara were controlled by the provision of expansion chambers fitted to the top of the furnace chimney. Dust created on removal of the sintered material from the furnace is drawn off through a cyclone and collected in a closed chamber. The crushing, grinding and grading are also accompanied by much dust formation and for the larger particles exhaust ventilation and a cyclone suffice. To eliminate the smaller particles under 15 microns in size a system has been devised for bubbling the dust through water which allows solid material to sink to the bottom of the apparatus, which is cleaned out from time to time. Crushing and grinding of dolomite and marble into powder is also a dusty operation and in it the larger particles are suppressed by means of a special exhaust system and cyclone. The apparatus is known as a microcyclone and makes use of combined centrifugal force and the resistance to the particles which takes place when they come into contact with the walls of the ducting. Transport of material from the meshes to the grinding machine creates dust and in order to control it a closed system of oscillating cylindrical metal tubes is used to convey the product from one machine to the other. The operations from this point until final bagging, are completely enclosed.

-- Bull. Hyg.

COMMUNITY AIR HYGIENE

- 1026 Use of Indexes of Air Pollution Potential in Mortality Studies. R. Schiffman and E. Landau. J. Air Poll. Control Assn. 11, 384-385 (Aug. 1961).

At the present time there are no completely adequate data for categorizing levels of air pollution throughout the United States. Accordingly, a large number of indexes have been prepared by the Air Pollution Medical Program for use as indirect measures to study the possible relationship between these imputed measures of air pollution and mortality. The construction of these indexes is based on potential sources of air pollution such as measures of home heating, specific and nonspecific industry, service station sales, etc. The authors have demonstrated a particular method in which a number of these indexes can be used as tools for medical research. They have examined the relationships of certain air pollution indexes with mortality from selected diseases and they have shown that positive relationships exist. There are sufficient statistical relationships in this work to indicate the need for further research and study.

-- Authors' summary

- 1027 Cobalt Base Additives Reduce Soot Emission by Oil-Burning Equipment. F. Mauss and H. Djavanmard. Cobalt (Brussels) No. 11, 21-27 (June 1961).

The tests described in this article show that the addition of organic compounds of cobalt to fuel oils decreases the weight of the combustion residues, independent of the operating conditions of the boiler. For a given weight of residue, the cobalt additives allow the

* Address not in current List of Periodicals.

amount of excess air to be lowered, and consequently reduce the waste heat. The results obtained are shown in tabular form. Taking into account the deviations that can be attributed to variations in operating conditions during the course of one day, it appears that the activities of most of the cobalt additives are of the same order: exceptions are the nonylphenate monosulfide, nonylphenate disulfide, and acetylacetonate, whose activities are about 20% higher, and also the second of the commercial naphthenates, whose activity is slightly less than the average activity of the cobalt compounds.

-- APCA Absts.

- 1028 Air Pollution from the Grain Industry. M. E. McLouth and H. J. Paulus.
J. Air Poll. Control Assn. 11, 313-317 (July 1961).

In the Twin Cities, the many elevators, mills, and plants of the grain industry comprise a substantial portion of the industrial picture. Millions of bushels of grain are processed into human and animal foods and other products each year in plants scattered throughout the area. The air contaminants from the grain industry operations consist of various sizes and types of particles from grain handling operations and certain odor producing compounds from linseed and soybean oil processing and refining, animal food production, and other processes. Grain unloading and loading, considered to be the dustiest operations, are carried on by essentially all types of mills and plants. Grain dust collected at the mills is utilized in animal food preparations after being prepared in a dust grinding mill. Handling of the collected dust and dust grinding to destroy weed seeds are extremely dusty operations that contribute substantial amounts of pollution to the atmosphere. Most of the dusty operations are exhaust ventilated through collection systems. Cyclone separators are the most commonly used collectors with baghouse filter installations gaining in prominence in recent years. For special situations in grain operations electrostatic precipitators and multicyclones are being used. Preliminary results of a study on the dispersion of dust from the grain industry plants indicate a considerable influence on the total particulate pollution in a limited area.

-- Authors' summary

- 1029 Exhaust Gas Oxidation on Vanadia-Alumina Catalysts. W. B. Innes and R. Duffy.
J. Air Poll. Control Assn. 11, 369-373 (Aug. 1961).

Unsaturated hydrocarbons in auto exhaust are believed to be the primary precursors of photochemical smog. Some of the kinetic studies desirable in evaluating catalysts for their oxidation are discussed. An approach is outlined for studying the kinetics of exhaust gas oxidation using data on vanadia-alumina catalyst composition to illustrate the method. First order kinetics fit available data and the activation energy for the pure olefin oxidation by excess air is about 17 K cal and that for CO is 21 K cal/mol. Oxidation rate constants in exhaust gas appear about equal to the product of the pure gas constant times the fraction of vanadium in the pentavalent state except for pentane and hexane which are much lower. The rate constant for pure compound oxidation increases markedly with degree of unsaturation and molecular weight. Activity for oxidation of ethene at 405°C and propene at 325°C directly correlates with V_2O_5 content up to 24%. On thermal deactivation, oxidation activity normally increases or stays constant down to about 70 sq.m./gram and thereafter is proportional to surface area.

-- Authors' summary

- 1030 Effects of High Volatile Fuel on Incinerator Effluents. R. L. Stenburg, et al.
J. Air Poll. Control Assn. 11, 376-383 (Aug. 1961).

The tests described in this paper demonstrate the difficulty of burning a high volatile solid waste material without making appreciable contributions to atmospheric pollution. The extent to which operational factors affect emissions of different pollutants is emphasized by the wide range of results obtained. From this it is only logical to conclude that minimization of pollutants cannot be effected by proper incinerator design alone but must depend on a combination of good design and proper operational procedures. Because of the basic physical and chemical laws involved, factors shown to affect the increase or decrease of air pollutants in this study would be expected to apply when this or a similar material is burned

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in other incinerators of different sizes and designs. Since modifying influences can result from many conditions of design, construction, and operation, causative factors brought out by these tests will require individual consideration and treatment. Reduction of over-all emissions to a minimum will require that optimum combustion conditions be maintained by controlling all operational factors within fairly close limits. Optimum combustion conditions would imply a temperature range of 1800° to 2000°F in the secondary chamber, the use of a relatively low proportion (15% to 20%) of underfire air (the remainder being overfire), and the charging of fuel continuously or in small batches as opposed to large batch charges.

-- Authors' conclusions

MANAGEMENT ASPECTS

- 1031 Management Health Examination Program in General Motors. S. D. Steiner.
J. Occ. Med. 3, 424-428 (Sept. 1961).

An evaluation was made of a periodic physical examination program covering 45,000 examinations. The examinations were done by private clinics and physicians. About 2/3 of the eligible group take advantage of the program. There is almost 100% participation when the employee is encouraged to be examined. The employee prefers a clinic which personalizes the examination. Approximately 90% believe the examination is thorough. The others were critical of the impersonal attitude of the examining physician and of the fact that too much of the examination was delegated to the resident staff. The examination reveals much unknown pathology. In 47% of the subjects conditions were discovered which required treatment. Medical treatment was given to 51% and surgical treatment to 30%. Over 60% of the group changed their living habits. A one-day meeting was held with examining physicians from 10 clinics. There was a general agreement that the examination should be more thorough for the over-40 age group. X-ray studies should be done whenever indicated but unnecessary exposures avoided. Postprandial blood sugar, uric acid, and occult blood tests should be included in the laboratory examination. The colon and rectal examination reveals much pathology information and should be included. A written report should be sent to the employee or to the physician of his choice.

-- Author's summary

- 1032 Automation. Anon. Illinois Labor Bull. 22, 14 (Aug. 1961).

Automation is a definite factor in producing joblessness reflected in the public assistance rolls. This is the conclusion of a study completed by the Cook County Department of Public Aid in which 138 persons on the assistance rolls were chosen at random and their unemployment studied through interviews. Begun at a time when industrial productivity and personal income were at an all-time high, the study clearly revealed that a high level of unemployment is not caused by recession factors alone, but by automation as well. The study revealed that automation could create a progressively more serious dependency problem in population-industry centers. By far the most important cause of unemployment among those interviewed were technological development which substituted machines for man-labor, the shifting of industry from one area to another, or the closing of plants altogether. Directly and indirectly, technological unemployment accounted for 69% of the total reasons reported for loss of jobs. The study concluded that the necessity of undertaking a series of pilot studies prior to the establishment of a rehabilitation program becomes evident when one compares the great imbalance between the billions spent for research on the development and application of new technologies and the small sums devoted to research on the social and economic consequences of new technologies. If this imbalance persists, it was stated, there is real danger that the social and economic problems of automation will grow more rapidly than our readiness to meet them.

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ACCIDENTS AND PREVENTION

- 1033 Acute Radiation Death Resulting from an Accidental Nuclear Critical Excursion.
T. L. Shipman, et al. *J. Occ. Med.* 3, Spec. Supple., 146-192 (Mar. 1961).

An accidental critical excursion took place in the plutonium recovery plant of the Los Alamos Scientific Laboratory on December 30, 1958. The average whole-body dose in the lethal case was estimated at between 3,900 and 4,900 rads, with the incident dose to the upper abdomen calculated to be approximately 12,000 rads of neutrons plus gamma radiation. Two other workers received total doses of approximately 130 and 35 rads, respectively, most of which was gamma radiation. The critical excursion took place in a tank of solution from which plutonium was being recovered, and the number of fissions was calculated to be about 1.5×10^{17} . The accident and subsequent events are recounted. The clinical case of the fatality is reviewed in detail. Data are included from routine chemical and pathological studies and special biochemical studies, whole-body counts, and gamma spectral measurements, dosimetric calculations, and health physics studies of area radiation levels. It was clearly apparent that the radiation dose varied widely in different parts of the body and even in different parts of the same organ. Results of clinical studies, covering the 14 months following the accident, are presented for the two workers who were exposed to non-lethal doses. Analysis of blood data led to the conclusion that changes following exposures in excess of 100 rads are characteristic and of clinical significance, whereas doses below 50 rads produce blood changes which are too slight to be of any diagnostic value. There are 58 references to the subject in the bibliography.

-- Nuclear Sci. Absts.

- 1034 Missile-Happy Canaveral: Workshop for Hygienists. L. B. Taylor, Jr.
Occ. Hazards 23, 40-41, 48 (Sept. 1961).

As many as 100 air pollution studies are annually conducted at Cape Canaveral involving missile exhaust fumes, to find contaminants in the atmosphere following full-thrust launching with different fuel mixtures. Samples of such toxic vapors as sulfur dioxide, oxides of nitrogen, beryllium, tetraethyl lead, and hydrogen chloride are taken for analysis. Propellants under study include hydrazine, hydrocarbon fuels, nitric acid and solid chemicals. The industrial hygienists also inspect water treatment, waste disposal, corrosion control, and food service facilities. Approximately 4,000 chemical and biological analyses are performed each month at the Cape's water and sewage laboratory alone, to insure that required quality of water is maintained for boilers, air conditioners, flushing fuel systems, and nuclear submarines. Whenever an industrial injury occurs, one of the hygiene sections investigates immediately. The section normally determines what protective clothing and equipment must be used in handling dangerous fuels, chemicals and solvents, and instructs Cape employees on hazards involving these substances. The hygienists will have to meet even greater challenges in the future. The huge Saturn rocket, for example, will be tested at Canaveral. Preliminary noise and vibration studies have already been made, but much additional testing will be necessary to assure safe working conditions once its flight testing program begins.

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DATE: 1961 Oct

DOC#: BOE012

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