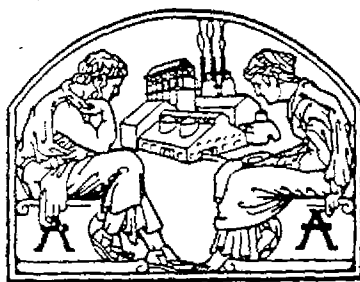


IN RE: ABRAMS
November 1953



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Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL . . . decisions and trends

JUNE, 1953
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INDUSTRIAL HYGIENE FOUNDATION

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TABLE OF CONTENTS

	<u>Page</u>
News Items	1
Occupational Disease Statistics	2
Legal Developments	3
Books, Pamphlets and Notices	4
Industrial Medical Practice	6
Skin Diseases and Burns	9
Chemical Hazards	10
Industrial Dusts	20
Physical Aspects of the Environment	23
Radioactivity and X-Radiation	27
Environmental Measurements	28
Preventive Engineering	32
Community Air Hygiene	34
Management Aspects	37
Accidents and Prevention	39
Miscellaneous	41
Index	43

03119552

IN RE: ABRAMS November 1992

LEGAL DEVELOPMENTS

- 552 Silicosis--Statute of Limitation--Time of Filing Application--Statutes Construed--Continuous Exposure.

If a claimant has been continuously exposed to the hazard of silicosis for 60 days while in the employ of his last employer and files his application for benefits within two years after his last exposure, the application is timely regardless of whether or not the 60-day period of exposure occurs within two years of the filing of the application. "Continuous exposure" means with reasonable continuity when related to conditions surrounding the exposure and is not broken by involuntary work stoppages beyond the employee's control. Richardson v. State Compensation Commissioner. West Virginia Supreme Court of Appeals. No. 10520. February 10, 1953. -- CCH

- 553 Psychoneurotic Reaction to Employment Accident--Causal Connection--Sufficiency of Medical Evidence.

An award of permanent total disability benefits, based upon the commissions's finding that the claimant's disability was caused by a psychoneurotic reaction to an employment accident, was reversed as not being supported by competent evidence where it was shown that the accident caused only minor physical abrasions and where psychiatrists' reports nowhere clearly established a causal relation between the disability and the accident. Miller Rasmussen Ice & Coal Co. v. Industrial Commission. Wisconsin Supreme Court. No. 165. March 31, 1953. -- CCH

- 554 Medical Dispensary Worker--Dermatitis--Injury as an Accident--Arising Out of Employment.

The claimant sustained a skin condition, diagnosed as dermatitis, while working in a medical dispensary of a state training school. Patch tests showed that the claimant was allergic to various of the drugs she had handled and that these drugs had probably caused the dermatitis. Although testimony revealed that dermatitis was infrequent among dispensary workers generally, other workers in the same dispensary had become subject to the malady. In reversing a denial of award under the workmen's compensation act, the upper court ruled that the claimant had suffered a compensable injury arising out of her employment. Despite the fact that the claimant may have contracted the skin condition due to an allergy somewhat peculiar to herself, individual allergies or weaknesses were held to be immaterial as long as the particular conditions of employment in fact caused the disability. Wright v. Wyoming State Training School. Wyoming Supreme Court. No. 2586. March 31, 1953 -- CCH

03119555

IN RE: ABRAMS
November 1992

555 Moulder--Collapse While Carrying Molten Brass--Rupture of Pre-existing Brain Tumor--Sufficiency of Evidence.

The claimant, a moulder, collapsed while carrying a heavy pot of molten brass during the course of his employment. Since there was evidence to support the finding of the Workmen's Compensation Board that the collapse was caused by a rupture of pre-existing angioma of the brain, that the collapse was causally related to the claimant's employment, and that the injury was accidental, an award in favor of the claimant was affirmed. Kot v. Crouse-Hinds Co. New York Supreme Court, Appellate Division, Third Judicial Department. No. 82-18. March 18, 1953. -- CCH

BOOKS, PAMPHLETS AND NOTICES

556 Health of Workers in Chromate Producing Industry. U. S. Public Health Service, Division of Occupational Health of the Bureau of State Services. Public Health Service Publication No. 192, 131 pp. (1953). For sale by Supt. of Documents, U. S. Govt. Printing Office, Washington 25, D.C. 50 cents.

This report presents the clinical and environmental findings of an investigation to determine the present health status of chromate workers and to evaluate the effects of the working environment on their health. Six plants employing a total of about 1,200 persons were included in the study. The dry-end processes generate dusts containing chromite ore, soda ash, roast, residue, sodium chromate and an insoluble chromium compound which is neither chromite ore nor a hexavalent compound. Sodium bichromate and sodium sulfate are found associated with the wet-end process. The greatest weighted average exposure to chromium-bearing dusts was 1.07 mg. chromium per cu. m. air, and occurred in the dry end. Exposure to more than 0.1 mg. water-soluble hexavalent chromium per cu. m. was found in a number of work areas. Medical examination of 897 persons and study of morbidity and mortality experience showed a high incidence of cancer of the respiratory system, amounting to over 1%, with a death rate 29 times that for all males in the United States. Colored males have the highest rate. Perforation of the nasal septum was found among 56.7% of the chromate workers. No excessive dental caries was found, but yellowish discoloration of the teeth and tongue, gingivitis, and periodontitis occurred frequently. Pulmonary fibrosis is not common. The acid-soluble, water-insoluble chromium compounds should be considered as a possible cancer cause, in addition to the trivalent and hexavalent compounds which have received attention. The findings of the survey indicate the need of adequate dust control, including enclosure of the process, good exhausts, and

03119556

November 1992

IN RE: ABRAMS

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better housekeeping. Frequent x-ray examination and continued study of morbidity and mortality rates are recommended.

-- Cond. from authors' summary

- 557 Individual and Community Health. W. W. Stiles. The Blakiston Co., Inc., 575 Madison Ave., New York 22, N.Y. 492 pp. (1953) \$6.00.

Life expectancy now is greater than ever before, but it can be increased another 10 years by applying the known principles of preventive medicine. The introductory chapter discusses progress in the broad fields of medicine and the existing needs to control disease and extend health. The chapters that follow deal with the various causes of death, including accidents and violence, wound infections, contact and air-borne diseases, food poisoning, diseases carried by sewage, insects, and animals, and diseases of the various organs. Socio-sexual problems, maternal and child care, and general problems related to medical care are also considered. A chapter is given to environmental and occupational diseases, classified as effects of heat and cold, poisonous gases, injurious vapors and dusts, injurious liquids and solids, dermatitis, burns, mechanical injuries, and electrical energy, especially atomic energy. Many of the individual harmful materials are discussed briefly. A chapter deals with medical aspects of workmen's compensation, including selection and placement of workers. The final chapter discusses careers in the health sciences and presents a brief history of advance in those sciences.

-- FFR

- 558 Textbook of Preventive Medicine. H. R. Leavell and E. G. Clark. McGraw-Hill Book Co., 330 West 42nd St., New York 36, N.Y. 629 pp. (1953) \$8.00.

The term "preventive medicine" has come to mean not only disease prevention, but also the promotion of health and prevention of total disability by rehabilitation of those damaged by disease; it is used in the broader sense in this book. The practice of preventive medicine has different interests to the private practitioner and the public health officer; they are set forth side by side, and it is shown that their viewpoints must be merged. The authors discuss levels of application of preventive medicine and the epidemiological approach to the subject. The chapters by other authorities in the field, deal with specific phases of preventive medicine, including: prevention of infectious diseases, nutrition in preventive medicine; long-term illness and the effect of the aging process; cancer prevention; heredity and preventive medicine; maternal and child health; mental health; and some of the general aspects. The chapter on occupational health, by J. J. Phair and F. Princi, covers the broader aspects of the subject, without going into details about particular hazards. The subjects include health promotion, specific protection against respiratory and skin hazards, accident prevention, early diagnosis and prompt treatment, disability limitation, occupational health programs, workmen's compensation and medical insurance programs, and relation of industry to the

community. Although the presentation of these subjects is necessarily brief, the information is up-to-date. The chapter on rehabilitation as a phase of preventive medicine, by H. A. Rusk, summarizes most recent practice as well as concepts of rehabilitation. The final chapters return to the general problems of preventive medicine, and include a discussion of biostatistics.

-- FFR

Aviation Toxicology. Aero Medical Association, Committee on Aviation Toxicology. The Blakiston Co., Inc., 572 Madison Ave., New York 22, N.Y. 120 pp. (1953) \$4.00.

The purpose of this book is to coordinate the knowledge of the professional groups dealing with aviation and to present data on the toxicology of the materials with which the aviator and airplane worker may come in contact. First the general features of the problems of aviation toxicology are discussed: allowable degree of bodily impairment, duration and intensity of exposure, effect of high altitude on toxicity, and methods of expressing gaseous concentrations in relation to altitude. Specific problems are then considered, including antifreezing agents, exhaust gases and smoke, fire extinguishants, hydraulic fluids, propellants, refrigerants, insecticides, toxic materials transported by air, and toxicity problems in manufacture and repair. Finally the individual compounds are discussed. Toxicity data for individual compounds are given in an appendix, and time-concentration curves of toxicity are presented for carbon dioxide, carbon monoxide, carbon tetrachloride, and methyl bromide. Another appendix gives calculations of the concentration of carbon monoxide in the blood stream at high altitude.

-- FFR

INDUSTRIAL MEDICAL PRACTICE

Employee Health Audit by Questionnaire. R. A. Hicks and N. B. Walker. Ind. Med. & Surg. 22, 211-214 (May 1953).

In connection with the establishment of a comprehensive medical service at the Naval Supply Center at Oakland, Calif., it was found that the rapid growth of employment and inadequate medical service had prevented making full medical records. Physical examinations of approximately 15,000 employees was out of the question. Information on the health and disabilities of these employees was obtained by use of a questionnaire. A trial questionnaire directed to a small group revealed defects which were corrected in the final form. Finally 65 questions in lay terminology that could be quickly answered were included. The findings aided in compiling the file of handicapped persons, so that appropriate measures could be taken for them. They also gave a record

03119558

IN RE: ABRAMS November 1952

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of the employee's condition, provided a broad view of the employees, relative to industrial health, and brought to attention specific areas of poor working conditions. In many cases the replies led to consultation with the employee.

- 561 Medical Preparation for Retirement. L. Wade.
Ind. Med. & Surg. 22, 215-218 (May 1953).

A number of factors contribute to the emotional and physical health of annuitants. The diversity and complexity of these problems require careful, long-term planning by the employee, the Medical Department, and the employee relations department if the desired goal is to be reached. Degenerative cardiovascular disease is the cause of most deaths and disabilities among the annuitant group. Limitation of time available for discussion with the prospective annuitants warrants concentration of efforts upon this particular problem. Our present knowledge concerning these diseases warrants providing guidance concerning nutrition, physical activity, and emotional health.

-- Author's summary.

- 562 Medical Supervision of Mining Apprentices. C. Amoudru, J. Dutilleul, and G. LaFay. Rev. med. miniere 5, 41-60 (1952) French.

In the coal mining regions of France, apprentices are selected and begin training at the age of 14, and go to the coal-face at 18. Medical examination during the training period at the Nord-Pas-de-Calais region includes tests for tuberculosis, astigmatism, and psychological condition. Those with astigmatism are eliminated because it predisposes to nystagmus, and glasses cannot be worn. Those subject to claustrophobia are also eliminated. Weight and general physical condition are also studied. In the mines of the Saar and Moselle, as reported in an appendix, the examinations and treatment are more extensive, and include blood group tests, tuberculin test with BCG vaccination if needed, ordinary vaccination inspection, tetanus immunization, physical development, and acuity of special senses. The examination is repeated every two years until the apprentice is reported ready to work.

-- Cond. from Bull. Hyg.

- 563 Industrial Medical Services in Pennsylvania. J. Shilen.
Ind. Med. & Surg. 22, 219 (May 1953).

Of the 21,400 industrial plants in Pennsylvania, 310, or 1.5% have full-time or part-time medical services, but since they are mostly the larger plants, 34.5% of the total of 1,800,000 workers are employed in plants with medical service. Nursing service is provided in a larger number of plants (5%) but they employ 30.7% of the total number of workers. The figures are tabulated according to type of industry and size of plant.

November 1992

IN RE: ABRAMS

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- 564 A Report on a Study of Rehabilitation Services of Great Britain.
H. G. Maule. *Occ. Psychol.* 26, 225-233 (Oct. 1952).

A study of rehabilitation services was conducted by a group of post-graduate students at the London School of Hygiene and Tropical Medicine. Early discussion within the group centered on the definition of rehabilitation and its differentiation from re-training and re-settlement. Finally the definition given by the American National Council for Rehabilitation was adopted; namely, "the restoration of the handicapped to the fullest physical, mental, social, vocational, and economic usefulness of which they are capable." Various government organizations gave support and encouragement to the projects. The program included visits to a number of rehabilitation centers, discussions with their staff members, and study of literature and correspondence. Extreme variations were found between different centers in regard to their conception of the meaning of rehabilitation. Much that was seen was excellent and encouraging. On the other hand, in some places, the work carried out or the attitude of mind of the staff were "disquieting" or "dismal". The following general criticisms were made: (1) there was a widespread tendency to group together all persons with a specific disability as being alike; (2) orientation seems to be too heavily in the direction of a physical handicap; and (3) there is too great a reluctance to put any theories to the test or to examine the effects of any actions in a scientific way. -- Cond. from Bull. Hyg.

- 565 Code of Practice for Noxious Dusts and Fumes. South African Bureau of Standards. Private Bag 191, Pretoria, S. Africa. English and Dutch sections, 32 pp. each (April 1952) 5 shillings.

This publication describes briefly the hazards from silica dust, and other dusts and fumes and prescribes safety measures for each. It concludes with tables of maximum allowable concentrations for noxious dusts and fumes, and for organic and mineral dusts. Most of the MAC's are the same as those adopted in the United States; however, the MAC given for arsenic is 0.15 micrograms per liter, (U.S. 0.5), for yellow phosphorus 0.1 (U.S. 0.5), and chlorodiphenyl 10 (U.S. 1). MAC's not given in the American table are: beryllium 0.01, chlordane 2, DDT 2, nitroaniline 25, all in micrograms per l., and parathion "should be absent." The MAC for asbestos is the same as the American standard, while those for silica-bearing dusts are somewhat lower. In addition, the MAC for barium sulfate is given as 500 particles per ml. (14 mppcf) and for cotton, wood, and flour dust 1,750 particles per ml. (50 mppcf). The arrangement of the pamphlet is unusual; the Dutch section is read by reversing the book, and both sections end at the middle.

- 566 Industrial Medicine: A Legitimate Field for the General Practitioner.
J. F. Kilgus. *Ind. Med. & Surg.* 22, 225-226 (May 1953).

The author maintains that the training and experience of the general practitioner fit him for the field of industrial medicine. He says in conclusion

03119560

November 1992
IN RE: ABRAMS

that no field of medicine offers a brighter future for a physician than the ever broadening field of occupational medicine.

SKIN DISEASES AND BURNS

- 567 Occupational Dermatoses. H. Rattner.
Ind. Med. & Surg. 22, 198-201 (May 1953).

A mild dermatitis of the hands is often aggravated by home remedies, and then secondarily infected and treated with a drug to which the patient may be hypersensitive, resulting in a widespread drug eruption. Scratching the lesions will cause further spread of the eruption. Most patients with hand eczema have either contact dermatitis, eczematoid ringworm, or nummular eczema. The distinguishing characteristics of these dermatoses are described. These three conditions must also be distinguished from scabies, erythema, multi-formi, psoriasis, pityriasis rosea, lichen planus, and alopecia areata, which are also described. Several forms of dermatitis affecting the face, including acne rosacea, seborrhoeic dermatitis, and lupus erythematosus, described briefly, should be distinguished from contact dermatitis. The treatment of occupational eruptions is dependent upon accurate diagnosis, and topical measures will depend upon the acuteness of the eruption. Treatment as well as diagnosis presents difficulties in many cases. Occupational dermatoses constitute one of the most challenging and interesting subjects in dermatology.

- 568 Chromium Eczema and the Industrial Diseases Law. E. Skog and N. Thyresson. Svenska Lakartidn. 49, 2345-2352 (Sept. 1952) Swedish.

Skin tests with 0.5% potassium dichromate solution applied to 3,237 patients showed that 13% of the males and 5.7% of the females were sensitive. During 1951, compensation was paid to 63 workers in Sweden for illness due to chromium and its compounds. In 62 of these cases the disability was "allergic contact eczema." Among them were 53 whose eczema was traced to chromic acid or its compounds, and 6 in which it was due to chromium-tanned gloves. In 1950 Jaeger and Pelloni showed that cement contains very small quantities of chromium, to which cement dermatitis was traced (IHF Abst. 458, May 1951; see also Abst. 456, May 1953). Skog and Thyresson have found hypersensitivity to chromium in 68% of the persons examined on account of cement eczema. They conclude that chromium allergy is common among male workers employed in certain industries, notably cement production.

-- Cond. from Bull. Hyg.

IN RE: ABRAMS November 1992

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- 569 Cost Allocations of Overtreatment Dermatitis. L. E. Gaul and G. B. Underwood. Indiana State Med. Assn. J. 46, 17-20 (Jan. 1953).

Convinced that overtreatment of patients is as great an evil as inadequate treatment, the authors studied the incidence of contact dermatitis due to overtreatment during a six-weeks period. Patients with a diagnosis of contact dermatitis, and who had had previous topical therapy, were asked to bring in all the remedies they had used, and the sequence of application was recorded. The onset, etiology, and course of the dermatitis was then correlated with the sequence of topical therapy. When the acute stage of the dermatitis had passed, patch tests were performed with these remedies. As a rule the severity of the patch test reactions to the remedies followed closely the course of the dermatitis. Patch tests showed that 27% of contact dermatitides were produced by topical treatments. Some of the remedies producing overtreatment had been prescribed by physicians, showing that skin preparations, particularly antipruritics, are marketed with insufficient pharmacological study. In most cases, however, the treatment was made by members of the family, friends, or lay diagnosticians. The evil of overtreatment can be reduced by an educational campaign, preventing dermatitis, needless suffering, and heavy drains on the family budget. -- Cond. from J. Am. Med. Assn.

CHEMICAL HAZARDS

- 570 Something New in Welding. W. L. Lea. Wisconsin Safety News 10, 8 (Jan.-Mar. 1953); Occ. Health (USPHS) 13, 75 (May 1953).

Within the past year or so, a type of arc welding employing a continuous electrode with inert gas shielding has made its appearance in the welding field. The metal used to make the weld is used as one electrode and comes in the form of coiled wire. It is fed at a controlled rate through a flexible guide hose. A second hose line supplies an inert gas (argon or helium). The process is used mainly in welding aluminum or stainless steels. No fluoride flux is necessary, so the fluoride hazard is eliminated. However, numerous cases of severe respiratory and skin irritation and secondary infection of the eyes occurred in welders using the process. It was found that large quantities of ozone are produced by the intense welding arc. Ozone concentrations found at the breathing zone varied from 4 to 13 ppm; the accepted MAC for ozone is 1 ppm. Effective ventilation control is obtained by the use of welding booths. Under certain circumstances the provision of supplied-air welding helmets may be the most satisfactory preventive measure.

03119562

IN RE: ABRAMS November 1992

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- 571 Blood and Urine Changes in Experimental Beryllium Poisoning. C. J. Spiegl, L. LaFrance and Betty J. Ashworth. Arch. Ind. Hyg. & Occ. Med. 7, 319-325 (April 1953).

Two clinical criteria studied in dogs acutely poisoned with beryllium compounds by injection or by inhalation have offered promise for further investigation. They were as follows: (1) In the red blood cells, the ratio of phospholipid to free cholesterol decreased after administration of beryllium sulfate. (2) In the urine of dogs exposed to beryllium fluoride, the ratio of uric acid to creatinine increased markedly and paralleled closely the course of exposure.

-- Authors' summary

- 572 Aspects of the Prognosis for Chronic Cadmium Poisoning. L. Friberg and A. Nystrom. Svenska Lakartidn. 49, 2630-2638 (Oct. 1952). Swedish.

In 1946 and 1947, workers in an alkaline accumulator factory were found to be suffering from chronic cadmium poisoning. A preliminary report was published in 1948 and a more detailed report in 1950 (IHF Absts. 576, May 1950, and 586, June 1951). Late in 1951 and early in 1952 a follow-up examination was undertaken. Five of the 43 workers had died, two probably from chronic cadmium poisoning. Emphysema of the lungs was very marked in one of the cases. The immediate cause of death was infarct of the heart in two cases, and acute pancreatitis in the fifth case. Most of the 38 surviving workers had been transferred to other parts of the factory where there was no risk of cadmium poisoning, but among them were 5 who showed definite progress of the disease. On the whole, however, there had been no marked change in the patients' symptoms. The conclusion is that, although no new cases of chronic cadmium poisoning were likely to occur since exposure had been reduced to a minimum, the workers who had already contracted the disease were likely to continue to suffer from it, although they would undoubtedly benefit from the precautionary measures taken since 1947.

-- Cond. from Bull. Hyg.

- 573 Industrial Medical Supervision of Lead Workers. G. Frede. Deut. Gesundheitsw. 7, 953-958 (July 24, 1952). German.

The author describes the medical supervision exercised over 95 lead mixers and solderers, exposed to both dust and fume. In addition to adequate ventilation, sanitation, and wearing of masks and respirators, the special medical supervision includes: (1) systematic inspection of the workroom by the plant doctor; (2) periodical estimation of the atmospheric concentration of lead; (3) semiannual medical examination of all workers; and (4) periodical brief medical reports on general health risks and protective measures. The medical examination includes inspection of the mouth for "blue line"; blood examinations, especially for punctate basophilia; urine examination; blood pressure readings; weight measurements, and chest examination.

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IN RE: ABRAMS November 1993

03119563-0014983

Inspection of the mouth showed no "blue line". Punctate basophilia is regarded as the most important aspect of blood examinations. The average level found in 79.5% of all cases was 500 per million erythrocytes; the highest ranged from 4,800 to 13,200. None of the subjects examined showed any symptoms of ill health but there was some correlation between high levels and careless habits leading to intake of lead. The author does not consider estimation of blood porphyrinuria a necessary factor of medical supervision, punctate basophilia being the simplest and most reliable criterion. Estimation of blood and urine is done only for differential diagnosis. The average amounts of lead in blood and urine were close to the critical levels, 0.06 mg. and 0.1 mg. per 100 cc., respectively. No indication of raised blood pressure was found. The average level for hemoglobin was 92% and of erythrocytes 5 million per cu. mm. The author concludes that the simplest and most reliable measure of medical supervision is the estimation of punctate basophilia, hemoglobin level, and total number of erythrocytes. -- Cond. from Bull. Hyg.

- 574 An Examination of 50 Workers Exposed to Tetraethyl-Lead Gasoline.
A. Andersson and A. Nystrom. Svenska Lakartidn. 49, 2772-2775 (Nov. 1952) Swedish.

The toxic effects of tetraethyl lead are described. While workers in the industrial production of the chemical may well be exposed to high concentrations, there is some doubt about the risk run by workers whose contact is less intimate, for example chauffeurs, car mechanics, and filling station employees. Accordingly, 50 such workers, including 12 drivers of tank vehicles, mostly employed for more than 5 years, were subjected to an ordinary clinical examination, a searching blood examination, including porphyrin tests, and urinary lead tests. All these tests were more or less negative, and the conclusion is drawn that apart from occasional acute discomfort arising from direct contact with the leaded gasoline, it is not likely to affect seriously persons coming into contact with it under the conditions mentioned.

-- Cond. from Bull. Hyg.

- 575 Manganese Poisoning in the Mines of Cuba. A Preliminary Report.
M. G. Avila and R. P. Ballina. Ind. Med. & Surg. 22, 220-221 (May 1953).

The authors have seen 25 cases of manganese poisoning in one of the largest mines of Cuba, employing 2,000 workers, and at least 25 more have been reported. All patients so far examined were exposed in connection with pneumatic drill work, especially in tunnels. The outstanding findings on examination relate to gait and speech disturbances. Muscular weakness, mask-like faces, uncontrollable laughter, sexual impotence, tremor of extremities and tongue, and twitching of fingers, are also frequently observed. For the biologic determination of manganese, spectrographic methods are employed. Thus far the results have not proved significant. Up to the present time, no therapy has proved effective. BAL and Artane are in present use.

- 576 Investigations on Chronic Mercury Poisoning among Dentists and Dental Nurses. T. Dalhamn. Nord. Hyg. Tidskr. No. 1-2, 32 (1953) Danish.

The concentrations of mercury in the air of 57 dentists' rooms have been determined. In the great majority of cases (51) the values were under the maximum concentration, 0.1 mg. mercury per cu. m. In connection with more special jobs, often of short duration, higher values have been found in a few cases. In 36 of 57 cases mercury excretion in the urine was less than 20 gamma per liter; in no case has a higher excretion than 100 gamma per l. been shown. The results of these analyses definitely indicate that there is no serious risk of chronic mercury poisoning for dentists and dental nurses in normal dental practice.

-- Cond. from author's summary (Arch. Ind. Hyg. & Occ. Med.)

- 577 Acute Toxicity of Carnotite Ore Dust. H. B. Wilson, H. E. Stokinger, and G. E. Sylvester Arch. Ind. Hyg. & Occ. Med. 7, 301-309 (April 1953).

Rats, rabbits, and a goat were exposed to carnotite ore dust, mean particle size 1.4 microns, for a total of 131 to 137 hours, at approximately 84 mg. per cu. m. The dust under the conditions of the experiment is highly toxic to the rabbit, moderately toxic to the rat and slightly toxic to the goat. The toxicity is characteristic of uranium poisoning and in degree resembles that of uranium trioxide.

-- Cond. from authors' summary

- 578 Hygienic Aspects of the Production of Vanadium Aerosol. I. V. Roshchin. Gigiena i Sanit. No. 11, 49-53 (1952) Russian.

During smelting the concentration of vanadium aerosol may rise to 16.5 mg. per cu. m. of air. In the vicinity of ferrovanadium smelting electric furnaces the dust concentration may reach 67.7; the content of vanadium pentoxide does not exceed 0.3, while that of the lower oxides of vanadium is under 0.45 mg. per cu. m. Experiments with rats showed serious intoxication of the animals after prolonged (2-4 month) exposure to 0.01 - 2 mg. per l. concentration of vanadium pentoxide or ferrovanadium aerosols. The former causes acute effects after 1 hour at 0.08 mg./l., but the latter does not cause acute effects even at 10 mg./l. owing to slow transfer of vanadium into the biochemical reactions. The lethal dose of vanadium pentoxide is 0.7 - 0.8 mg./l., and that of ammonium vanadate is 1 - 1.3 mg./l. Usually dilation of blood vessels and edema of the brain are observed.

-- Chem. Absts.

- 579 Nature and Genesis of Pulmonary Alterations in Carbon Tetrachloride Poisoning. W. Umiker and J. Pearce. Arch. Pathol. 55, 203-217 (March 1953).

The pulmonary changes in 27 young men who died of carbon tetrachloride poisoning are described. Details regarding each case are given. The

basic lesion consisted of an exudate of fibrin, a pseudomembrane lining the alveolar walls by growing fibroblasts, and a proliferation of cells resembling epithelium lining the alveolar walls. The appearance and roentgenograms of the lungs of patients with carbon tetrachloride poisoning are similar to those that have been described for uremic patients. It is highly probable that the pulmonary changes in carbon tetrachloride poisoning are the result of the uremia produced by the necrotizing action of that chemical on the kidney rather than the result of its direct action on the pulmonary parenchyma during either inhalation or excretion.

-- Cond. from authors' summary

⁴⁸⁰ Carbon Tetrachloride Poisoning. H. K. B. Allebach and W. R. McPhee. Missouri Med. 50, 106-112 (Feb. 1953).

A fatal case, three nonfatal cases, and brief references to 596 cases from the literature are reported. The subject of carbon tetrachloride poisoning is treated in the classical manner from the standpoints of incidence, mortality, etiology and susceptibility, symptoms and signs, pathogenesis, pathology, diagnosis, treatment, prophylaxis, and prognosis. Emphasis is placed on the toxic properties of the chemical, the greater than generally believed incidence of cases, and newer aspects of the treatment of victims.

-- Authors' summary

⁵⁸¹ Toxicity of Butyl Stearate, Dibutyl Sebacate, Dibutyl Phthalate, and Methoxyethyl Oleate. C.C. Smith. Arch. Ind. Hyg. & Occ. Med. 7, 310-318 (Apr. 1953).

Four plasticizers, butyl stearate, dibutyl sebacate, dibutyl phthalate, and methoxyethyl oleate, proposed for use in food-wrapping films, have been examined for acute and chronic toxicity in rats. The acute lethal oral doses in the order listed, were over 32, 16 to 32, 8, and 16 grams per kilogram. The compounds were no more toxic when given parenterally. When administered chronically in the diet, the maximum concentration which did not significantly reduce normal growth was more than 6.25% in the case of butyl stearate and dibutyl sebacate. For dibutyl phthalate the concentration was 0.25% and for methoxyethyl oleate it was 0.01 to 0.05%. The first three in the highest dietary concentrations employed did not provoke specific gross or microscopic pathological change. Renal calculi were found in some of the rats fed 1.25% methoxyethyl oleate for more than 6 months. Butyl stearate and dibutyl sebacate at 6.25% had no effect on fertility but slightly retarded growth of the young. In vitro experiments indicated that these plasticizers are metabolized in the body in much the same way as the fat normally ingested in the diet. Based on these data in rats, butyl stearate and dibutyl sebacate when incorporated in films for wrapping foods appear to possess little, if any, potential hazards for humans, the calculated safety factor being in excess of 1,400.

-- Cond. from authors' summary

03119566

November 1993

IN RE: ABRAMS

- 582 Industrial Atmosphere: V. Formaldehyde in the Atmosphere of Working Environment. J. Roubal, J. Zdrzil, and F. Picha. *Pracovni Lekarstvi.* 4, 283 (Aug. 1952). Bohemian.

The source of contamination of the air in work places where glues with a formaldehyde-urea base are used is to be found in the free formaldehyde contained in resins. Quantities of 0.56 to 1.4% of free formaldehyde were found in glues examined. Technicians maintain that the use of glues which do not contain free formaldehyde is not practicable. Where resins are produced, it is necessary to provide good ventilation. Free formaldehyde remains for a long time on objects stuck together with synthetic glue or coated with a resin containing paste. Sites where such material is worked should contain adequate ventilation. It is best to use gas masks or respirators in places where formaldehyde is used in spraying hides for tanning.

-- Cond. from English summary (*Arch. Ind. Hyg. & Occ. Med.*)

- 583 Comparative Toxicity of Synthetic and Natural Glycerin. C. H. Hine, H. H. Anderson, H. D. Moon, Mary K. Dunlap, and Margarita S. Morse. *Arch. Ind. Hyg. & Occ. Med.* 7, 282-291 (April 1953).

The acute toxicity of natural or synthetic glycerin, based on intragastric administration (LD50) is 23 g. per kg. for mice, 27.2 for rats, and 11 for guinea pigs, with no significant differences between the two products. The chief pharmacologic effect of either glycerin was stimulation of the central nervous system. The chief alteration in anatomic structure following intragastric administration of either glycerin was congestion of the pylorus, small intestine, lungs, and kidneys. In the chronic toxicity studies, one group of rats were fed 20% natural or synthetic glycerin for a year, and another group 5 or 10% for two years. No toxic effects from either glycerin were found. Sensitization tests on guinea pigs and eye irritation studies on albino rabbits showed that no sensitization occurred and that no skin irritation appeared after 90 days of application. There was no measurable eye irritation.

- 584 Pharmacology of Phosphoric Acid Esters. Ethylthioglycol Diethyl Thiophosphate, the Active Principle of Systox. W. Wirth. *Arch. exptl. Pathol. Pharmacol.* (Naunyn-Schmiedeberg's) 217, 144-152 (1953) German.

Systox is an insecticide that is sprayed on plants. It is taken up by the roots and leaves and remains for several weeks in the circulatory system of the plant. The main constituent, ethylthioglycol diethyl thiophosphate, is obtained at 95% purity as a liquid oil boiling at 128°C. An isomer, 2-(ethylthio) ethanethiol diethyl phosphate, is also present. Both are poorly soluble in water and easily soluble in organic solvents. The LD50 for the male rat is 7.5 mg. per kg. for the first compound and 1.5 mg. per kg. for the second. The symptoms of poisoning, identical for both, consist in fibrillary muscle contractions, disturbance of equilibrium, defecation, salivation, and chromodacryorrhea, finally clonic-tonic convulsions, and spasm of the respiratory

03119567

IN RE: ABRAMS November 1992

HHBB-0014987

muscles. Atropine is an inhibitor. The effects on various organs correspond approximately to those of diethyl p-nitrophenyl thiophosphate. The cholinesterase activity recovered within a few days, and brain activity within 1 to 2 weeks. It is supposed that during recovery the enzyme is at least partly reactivated.

-- Cond. from Chem. Absts.

585

The Health Importance and Use of Organic Solvents for Insecticides.

G. A. Hunold. *Schadlingsbekampf.* 44, 141-147 (Sept. 1952). German.

Many details of the physical, chemical, toxic and explosive properties of organic substances used as solvents for insecticides are here recorded. The absorption by the body, the distribution in the tissues and the excretion of these substances are described, as well as the toxic symptoms and signs of those which are poisonous. It is considered that the toxic effects which have been attributed to the absorption of DDT and BHC should often have been ascribed to the inhalation of toxic solvents. Some of the measures that should be taken to prevent this danger are outlined.

-- Bull. Hyg.

586

New Approaches to Health Evaluation of Insecticides. K. Kay. *Can. J.*

Public Health 43, 516-522 (1952).

The history of insecticides and other pesticides and the knowledge of their toxicity is first related. The toxicity studies on various insecticides are then reviewed, with most attention to the work of the Canadian National Health Department. An important part of the investigation has been the study of trade formulations, because the toxicity of a pure compound is greatly modified by other materials added as vehicles or emulsifiers or present as impurities. As the result of this study formulations have been developed that lower the toxicity rather than enhance it. Methods of preparing the insecticide have often influenced its toxicity. Experiments under field conditions have been an important part of the work. Questions in regard to licensing are discussed.

587

Insecticides and Rodenticides. B. H. Dolin. *Monthly Rev. N. Y. State Dept. Labor* 32, 13-16 (April 1953).

The uses and toxicities of a number of insecticides are discussed briefly. A case of multiple poisoning by methyl bromide is described. The chemical was used to fumigate flour bins and the adjacent building. Although respirators were worn and apparently all due precautions were taken, several persons were poisoned and two died. Autopsies showed the presence of methyl bromide in their organs. The gas masks were found saturated with methyl bromide. Apparently the concentration of the gas had reached an extremely high value between its release from the cylinders and opening of the windows. The concentration was therefore too high for the respirators to be effective.

03119568

IN RE: ABRAMS
November 1993

By contrast another case is presented in which a thorough investigation of the health hazard of a mixed fumigant before its use prevented injury. Fumigation and spraying are the most hazardous methods of application of insecticides. The best protection is given by mechanical exhaust ventilation with remote control and by air line respirators. Attention is also called to absorption of some insecticides through the skin.

- 588 Chloronitrobenzene Poisoning. H. Werner and U. Wetzel.
Artzt. Wochschr. 7, 1210-1211 (1952) German.

Five cases of p-chloronitrobenzene poisoning are described. In all cases changes in the blood cell counts were observed, consisting of a lowering of the red cells and different abnormalities in the differential count, low percentage of lymphocytes. These changes reverted to a normal count after a hospital stay. No liver damage occurred. -- Chem. Absts.

- 589 The Absorption and Excretion of 4,6-Dinitro-o-cresol. II. The Elimination of 4,6-Dinitro-o-cresol by Man and by Animals. E. King and D. G. Harvey. Biochem. J. 53, 196-200 (Jan. 1953).

In man DNOC accumulates as a result of small daily doses because it is eliminated very slowly, while the rat or rabbit seems to be capable of dealing efficiently with large doses. In man both detoxication and elimination are inefficient. Apparently DNOC is stored principally in the extracellular fluids. The DNOC was found in the synovial fluid and in cerebrospinal fluid, and it apparently becomes attached to the albumin.

-- Cond. from Chem. Absts.

- 590 The Absorption and Excretion of 4,6-Dinitro-o-cresol (DNOC). I. Blood Dinitro-o-cresol Levels in the Rat and Rabbit Following Different Methods of Absorption. E. King and D. G. Harvey. Biochem. J. 53, 185-193 (Jan. 1953).

The use of DNOC has led to fatal casualties among agricultural workers. DNOC can be absorbed readily from the alimentary canal, and through lungs and skin into the blood in rats and rabbits. A significant blood DNOC level can be maintained in rats by repeated daily doses of 5-10 mg. per kg. The rabbit can also absorb DNOC through the skin, causing an increase in blood levels after repeated applications. When a level of 100 gamma DNOC per g. of blood is attained in rats, further treatment with DNOC or an increase in environmental temperature may cause the death of the animals. A rise in environmental temperature causes an increase in mortality of rats without significantly altering the blood DNOC level. -- Chem. Absts.

03119569

IN RE: ABRAMS November 1992

- 591 Observations on Toxicity of Aldrin. I. Growth and Estrus in Rats.
W. L. Ball, K. Kay, and J. W. Sinclair. Arch. Ind. Hyg. & Occ. Med. 7,
292-300 (April 1953).

The experiments reported in this paper represent preliminary exploration of the mammalian toxicity of aldrin and the related compounds in the commercial formulations. Chronic toxicity has been explored with the criteria of growth and effect on the sexual cycle of females. In rats an intake of 20 ppm aldrin in the diet resulted in increased food consumption and gain in weight. These animals also experienced disturbance of the sexual cycle. Neuromuscular movement has been evidenced by convulsions, irritability, and hyperexcitability. These findings appear to represent systemic stress of the type produced by nonspecific stressor agents. It is now widely accepted that long-term exposure even to nonspecific stressors carries implications with respect to health. Hence, investigation of nonspecific stressor action forms a necessary facet of health hazard evaluation, apart from the estimation of the specific action of a compound. Further experiments are in progress to confirm the nonspecific stressor action of the compound and possibly to establish the nature of specific toxicity.

-- Cond. from authors' summary

- 592 Teflon-- A Plastic with an Inhalation Hazard. H. E. Stokinger.
Occ. Health (USPHS) 13, 88 (June 1953).

Teflon is a practically indestructible polymer which shows exceptional resistance to heat and chemicals. It has been used as electrical insulation, tubing, and gasket material for jet engines, and its range of application is broadening. Two types of industrial exposure appear to be harmful. Finely divided teflon, if inhaled, appears to produce a condition resembling metal fume fever. The reaction may set in some hours after exposure and usually disappears within 24 hours with no after-effects. The second type of exposure is to a very fine sublimate believed to contain adsorbed hydrogen fluoride which is given off when teflon is heated to about 360°F. The severity of the reaction depends on atmospheric conditions as well as exposure but pulmonary edema may result. The atmospheric concentration of hydrogen fluoride should be held at the acceptable standard of 3 ppm or else metal-fume-type of respirators provided. Before the worker is exposed to heated teflon, it should be determined that he has no history of chronic respiratory infection, and he should be given a chest x-ray examination.

- 593 Mechanism of Poisoning from Wax Crayons. F. Rieders and H. Brieger.
J. Am. Med. Assn. 151, 1490 (April 25, 1953).

Two of eight samples of para red and three of 24 red wax crayons were found to contain unreacted p-nitroaniline. Methemoglobinemia following ingestion of red wax crayons is obviously due to the presence of p-nitroaniline in certain brands or batches of these crayons.

-- Authors' summary

03119570

IN RE: ABRAMS
November 1992

- 594 Observations on Occupational Pathology in a Polystyrene Resin Factory. M. Barsotti, L. Parmeggiani, and C. Sassi. *Med. lavoro* 43, 418 (Nov. 1952) Italian.

Occupational disturbances affecting workers in a polystyrene factory were studied. The process includes ethylation of benzene, dehydrogenation of the product to styrene in the presence of aluminum chloride, and polymerization of the styrene. A total of 41 workers were studied. Most of the workers in contact with styrene vapor in concentrations of 0.1 to 0.8 mg. per liter showed irritation of the pharyngeal and conjunctival membranes and of the skin, and slight gastric afflictions. Several of the workers suffered from nervous troubles, in particular diminished night vision, and had slight leucopenia with relative lymphocytosis. Urinary elimination of hippuric acid was normal in all these workers. It should be recalled that since the maximum allowable concentration is at present fixed at 0.6 to 0.9 mg./l. (140 to 210 ppm) concentrations should not exceed 0.6 mg./l. Moreover, the concentrations of styrene should be fixed at rates under 0.85 mg./l. (200 ppm). Workers who handle aluminum chloride who are consequently exposed in addition to hydrochloric acid fumes incur the risk of bronchitis and itching dermatitis. (Ed. note - The accepted MAC's for both ethylbenzene and styrene in the U.S. are 200 ppm).

-- Cond. from English summary (Arch. Ind. Hyg. & Occ. Med.)

- 595 An investigation into the Health of 625 Employees Engaged in Gas Production in New South Wales. C. J. Cummins, T. I. Dunn, H. E. G. Rayner, and J. L. Sullivan. Report of Division of Industrial Hygiene Department of Public Health, New South Wales, 43 pp. (1953).

This survey of six representative units engaged in gas production in New South Wales emphasized such hazards as inhalation of dust, contact with carbon monoxide, exposure to high temperatures and climatic extremes, and the dermatogenic effects of the handling of tar and tar products. There was some evidence that dust exposure led to a greater liability of chronic bronchitis, but not to skin diseases or to pneumoconiosis. Working conditions were such that carbon monoxide, although present, produced no serious effects. The observed exposure to high temperatures and climatic extremes did not produce ill effects. Gloves and barrier creams gave sufficient protection from tar contact.

-- Cond. from Arch. Ind. Hyg. & Occ. Med.

Tact is giving a person a shot in the arm without letting him feel the needle.

-- Natl. Safety News

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November 1993

IN RE: ABRAMS

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INDUSTRIAL DUSTS

596
November 1992
IN RE: ABRAMS

Reduction of the Dust Concentration in Stopes and Airways by the Use of Sprayers in Stopings: Results of a Survey Conducted by the Institute of Mines on the Efficiency of Sprayers in Belgian Coal Mining. Institut d'Hygiene des Mines, Hasselt, Belgium. Communication 100. (Nov. 4, 1952) French.

This study was made on different types of spraying devices of different makes (Belgian and foreign) and on their application in the control of dust concentration in the mining and underground transportation of coal ores. Three cases were considered: (1) in a stope equipped with shaking conveyor units; (2) in a stope equipped with metal chutes and apron conveyors, and (3) in an airway in which the transportation was done by shaking conveyors, belt conveyors, and bucket elevators. For each of these three cases the Institute of Mining Hygiene recommended one of the 23 Belgian or 33 foreign-made sprayers which it tested. Characteristics considered were: the quantity of water consumed; the angle of the jet; the range of the jet and its penetrating force; and the nature of the water cloud. The sprayers are also classified as follows: (1) for the wetting of stopes and galleries; (2) to prevent dispersion of an already formed dust cloud; and (3) for the wetting of the coal at loading points. Photographs of the sprayers and their calibration curves showing the relation of water consumption to the water pressure are also included.

-- Cond. from Arch. Ind. Hyg. & Occ. Med.

Dust Control at the Source of Formation in Mine Transport. R. Kortschik. Occ. Safety and Health 2, 171 (Oct.-Dec. 1952).

Methods employed in suppressing dust formation in the Ruhr and other European coal mines are discussed. Various methods of transport are considered, and the use of water sprays, local exhaust, and dust barriers is described for each application. Emphasis is given to minimizing dust generation during transport by careful handling of the coal. For example, the height of the drop at transfer points should be kept to a minimum, as are irregularities in tubes and chutes. Application of the methods described must be guided by the consideration of the combined mining and transport system as a unit rather than as isolated operations. Good ventilation is a basic requirement for all transport methods. The optimum air velocity is given at 160 to 240 ft. per minute. Above 300 ft. per minute, settled dust may be resuspended in the air. At velocities that are too low, dust removal becomes inadequate.

-- Arch. Ind. Hyg. & Occ. Med.

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- 598 Silicosis in the Diatomaceous Earth Factories. T. Ebina, Y. Takase, Y. Inisawa, and K. Horie. *Tohoku J. Exptl. Med.* 56, 214 (Aug. 25, 1952).

Roentgenological examination revealed 12 cases of silicosis in the 106 workers in 6 factories using diatomaceous earth at Enda, Japan. Eight cases were in the first stage, 3 in the second, and only one in the third. The shortest period that incurred silicosis was 3 years and the most advanced stages were found in a group employed 51 years or more. Morbidity increased with age and period of employment. Except for the tendency to decrease in breathing capacity, subjective and objective symptoms were few. Tuberculous complication was found only in one case of the first stage. The Enda diatomaceous earth contains 76% to 86% silica, which is amorphous hydrated silica in the condition of irreversible colloid and not quartz, which is generally considered as the cause of silicosis.

-- Cond. from authors' summary (Bull. Hyg.)

- 599 X-Ray Analysis of Foundry Dusts in Relation to Silicosis and Siderosis. G. L. Clark and W. F. Loranger. Abstracts of Papers, 123rd Meeting Am. Chem. Soc., p. 21B (March 1953).

The x-ray diffraction method of Clark and Reynolds for the determination of crystalline alpha-quartz has been adapted and greatly improved for and intensive survey of dusts in a large steel foundry. For quantitative analysis calcium fluoride is added as an internal standard. The mixture is analyzed with the recording Geiger spectrophotometer, calibrated with standard samples. The dusts from every area of the foundry have been analyzed and correlated with ventilating conditions and the incidence of silicosis in designated areas. The appearance of shadows in radiographs in areas of zero or very low quartz concentration is found to be due to siderosis. Iron was determined chemically in all dusts. The results are also considered in terms of the effects of aluminum therapy and the possible analogous effects of metallic iron in producing benign siderosis.

-- Condensed

- 600 Anthracosilicosis Occurring in a Foundry Employee. L. E. Hamlin. *Arch. Ind. Hyg. & Occ. Med.* 7, 339-351 (April 1953).

The case presented deals with anthracosilicosis occurring in a foundry moulder in whom the pathological findings were identical with those found among coal miners. Sea-coal is a possible source of exposure. The case terminated fatally within nine months. The need for early recognition, accurate interpretation of clinical and roentgenological findings, and competent pathological studies is stressed.

-- Cond. from author's summary

03119573

November 1992

IN RE: ABRAMS

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- 601 Right Ventricular Hypertrophy in the Pneumoconiosis of Coalminers.
A. J. Thomas. Brit. Heart J. 13, 1-9 (1951).

A series of 50 hearts from cases of coalminers pneumoconiosis have been dissected and the ventricular weights recorded. The ratio of left ventricle to right ventricle, LV/RV ratio, shows a great reduction, and there is a consistent relative increase in the weight of the right ventricle. A cardiographic study of 146 persons (normal men, miners and non-miners, and patients with all stages of pneumoconiosis) has shown that V6 changes most with increasing severity of lung disorder. In the most severe groups the R wave of V6 is diminished and the S wave is increased in amplitude. A suggestion is made that a lead from the third interspace immediately above V2 may help in the diagnosis of right ventricular hypertrophy when it shows an r' wave of 4 mm. or more in height. Certain effects of respiration on the electrocardiogram are described, particularly the respiratory variation of the chest leads on the right side. This is presumed to be a positional change, but some findings suggest that the mechanism of respiratory variation should be further investigated in relation to respiratory function.

-- Author's summary (Bull. Hyg.)

- 602 Factors Favoring Phagocytosis by Reticulo-Endothelial Cells Early in Inflammation. Edna H. Tompkins and Mary A. Grillo. Am. J. Pathol. 29, 217-231 (March-April 1953).

The reticulo-endothelial cells of subcutaneous tissues, the so-called resting-wandering cells, represent active defenders in the first 12 hours of inflammation. They become activated in preparation for phagocytosis by contraction, excretion of fluid from their "fluid vacuoles," and changes in the consistency of their cytoplasm. Once activated, they are aided in making contact with particulate substances and are supported in "surface phagocytosis" by the movements of the underlying muscles and of the infiltrating ameboid polymorphonuclear cells. They carry the burden of phagocytosis before arrival of the polymorphonuclear cells; and they alone must phagocytose for about 12 hours the many invading substances that are not phagocytosible by the polymorphonuclear cells.

-- Authors' summary

- 603 Dust Diseases. G. E. Spencer. Bull. Allegheny Co. Med. Soc. 42, 389-391 (April 25, 1953).

This brief paper gives advice to family physicians to whom x-ray films from a mass survey have been referred when pneumoconiosis is indicated. Survey physicians do not attempt to differentiate the dust diseases, merely reporting the findings as "pneumoconiosis." It is the responsibility of the family physician to determine which of these diseases is present, and to decide what should be done. After military tuberculosis, carcinomatosis, certain fungus diseases, and siderosis due to organic disease are excluded, the various pneumoconioses must be considered. Anthracosis, silicosis,

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IN RE ABRAMS November 1992

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siderosis, berylliosis, asbestosis, and the organic dust diseases are discussed briefly in relation to diagnosis. The importance of personal and occupational history is emphasized. The factors to be considered when deciding whether a man should be taken from his job are discussed.

- 604 The Clinical Picture and Pathology of Asbestosis. W. Behrens, Jr.
Z. Unfallmed. u. Berufkrankh. 45, 129-140 (June 15, 1952); 179-189
(Sept. 15, 1952). German.

This paper presents an extensive review of literature on asbestosis including distribution and types of asbestos, its mining, treatment, and use, dust hazards, and effects of length of exposure of the dust in different concentration. Symptomatology, diagnosis, and x-ray findings in the different stages of asbestosis are described. Special mention is made of the association of asbestosis with carcinoma, which is much more frequent than that of silicosis. Post-mortem reports from the literature indicate that in 309 cases of asbestosis there were 44 lung carcinomas (14.2%), whereas in 2,204 cases of silicosis only 32 carcinomas were found (1.4%). The experience of the association of tuberculosis and asbestosis varies greatly in different countries. English investigators have recorded a high rate of tuberculous infection in asbestos workers, but it is a rare complication in America and the rate is low in Germany. The macroscopic and microscopic appearances of the lungs are described, and the nature and significance of asbestosis bodies are discussed and an extensive reference list dealing with that controversial subject is given.

-- Cond. from Bull. Hyg.

- 605 Lung Carcinoma Caused by Asbestos Inhalation. F. Boemke.
Med. Monatsschr. 7, 77-81 (1953) German.

The relation between fibrotic changes caused by asbestos deposits in the lung and carcinoma is discussed. The lower lobe is the site of predilection. Characteristic are the multicentered developments of flat epithelium carcinoma.

-- Chem. Absts.

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 606 Carbon Dioxide and Respiratory Regulation at Altitude. F. G. Hall.
J. Appl. Physiol. 5, 603-606 (April 1953).

Fourteen young men exposed to a simulated altitude of 22,000 feet breathed gas mixtures with varying concentrations of carbon dioxide. The partial pressures of oxygen and carbon dioxide in alveolar air were correlated

with pulmonary ventilation measurements. The results indicated that hypoxic and carbon dioxide stimuli act independently to produce changes in pulmonary ventilation at altitude. When both are strong they act additively. When, however, the alveolar partial pressure of carbon dioxide falls below a certain level as a consequence of an increased alveolar ventilation, the level of that ventilation would seem to depend solely upon the strength of the hypoxic stimuli. -- Author's summary

Adaptation to High Altitude: Changes in Lung Volumes during the First Seven Days at Mt. Evans, Colorado. S. M. Tenney, H. Rahn, R. C. Stroud, and J. C. Mithoefer. *J. Appl. Physiol.* 5, 607-613 (April 1953).

The lung volumes of four subjects during a 7-day stay at 14,250 feet have been studied, and the following trends observed. The vital capacity decreased during the first 3 days, then progressively increased in all subjects and exceeded sea level values in two subjects. The residual volume increased the first day, then fell during the next 4 days and had leveled off by the end of the week so that three subjects were above control values, and one subject was just at sea level value. The total capacities were high initially, but by the end of the week two subjects had total volumes above those at sea level and two below. The expiratory reserve volume increased progressively in all subjects over the first 6 days. Breathing oxygen in all four subjects and continuous positive pressure breathing in two subjects failed to increase the vital capacity. Certain implications of the lung volume changes, particularly as concerns pulmonary blood volume changes, are discussed. -- Authors' summary

Controlling Heat Exposure. Anonymous.
Natl. Safety News 67, 34, 35, 115-117 (May 1953).

The effects of heat on the human body are discussed. The factors influencing body heat balance are: (1) air temperature; (2) air velocity; (3) moisture content of air; and (4) mean radiant temperature of the surroundings. Many factors must be considered in studying upper temperature limits for work. Loss of salt through perspiration is an important factor. The remedies considered are exhaust ventilation, which gives limited relief, air cooling and drying, protection from radiation by clothing and shields, personal hygiene, and adequate intake of drinking water and salt.

A Comparison of Physiological Adjustments of Clothed Women and Men to Sudden Changes in Environment. T. Inouye, F. K. Hick, R. W. Keeton, J. Losch, and N. Glickman. *Heat. Pip. Air Cond.* 25, 125-130 (May 1953).

Women adjust as readily as do men to sudden entrance into a hot humid environment. Their skin temperatures rise promptly, even faster than is observed for men. Sweat is slower to appear than in the case of the men.

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As women leave a hot humid room and enter one which is normally comfortable, they feel cool, stop sweating promptly, and rapidly adjust their skin temperatures much as do men. This adjustment is controlled by: (1) sweat accumulated in their clothing and available for evaporative heat loss; (2) relative humidity; and (3) clothing. -- Authors' summary

- 610 Proceedings of the First Annual Conference on Industrial Vision, Rutgers University, New Brunswick, N.J. 48 pp. (1953). Obtainable from Dr. Andrew W. Fischer, New Jersey Optometric Assn., 162 West State St., Trenton 8, N.J., 50 cents.

Ten papers covering various subjects pertaining to industrial vision were presented at this conference. The meaning and value of visual programs were discussed from two standpoints: the meaning to employees, management, and the community, by L. H. Whitney; and the meaning in labor relations, by L. F. Johnson. The installation and operation of vision programs was discussed by R. J. O'Shea, in the light of Army experience. H. B. Peters gave suggestions and discussed problems concerning the organization of a workable vision program. Under the title "Eyes for Defense," R. R. Sullivan emphasized the need of good vision in the Navy, discussed the hazards, and described the Navy's program. The subject of industrial eye injuries was reviewed in outline form by Hedwig S. Kuhn. Control of eye accidents as one phase of a visual program, and the savings achieved from accident control, were discussed briefly by W. N. Cox. Two papers dealt with lighting: as a means of reducing accidents, by H. L. Logan, and its relation to the job, by S. K. Guth. The functional use of color in the working environment was the subject of a paper by F. Birren.

- 611 The Problem of Noise in Industry. C. R. Walmer. Ind. Med. & Surg. 22, 202-206 (May 1953). Reprints available from the Foundation.

In New Jersey claims for occupational loss of hearing amounting to more than \$5 million have been filed against a single company. In Wisconsin 25,000 to 100,000 potential cases are awaiting a State Supreme Court decision in a test case. These suits may be the forerunners of many more. The situation is urgent, imminent, and fraught with danger. It is comparable to the silicosis problem as it existed in the early 1930's, but is even more serious, and must be met by remedial measures as was the silicosis situation. Many complex questions are involved, including distinguishing between occupational and non-occupational hearing loss, and between temporary and permanent deafness, the problem of individual susceptibility, and measuring the effect of noise on the nervous system. Standard techniques must be established for measuring of hearing impairment, and the effects of intensity, frequency, intermittency, and duration must be evaluated. When these facts are established control measures must be developed. The legal profession will then have facts on which to present cases and make decisions. Only by teamwork

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IN RE: ABRAMS November 1992

among all the professions concerned can the basic principles of sound be ferreted out and these goals achieved. The program of the project undertaken by the Foundation is outlined, and other investigations made or in progress are reviewed. The results of these investigations must be brought together and studied thoroughly as a whole, and industry must take a much more active part in future research.

Noise. J. C. Radcliffe. Occ. Health Rev. (Canada) 4, 3-6 (March 1953).

The author presents briefly the fundamentals of noise and its effects. Terms are defined and the decibel unit is explained. The process of hearing and its dependence on frequency, exposure to noise, and age, are discussed. The present status of sound level standards is described, and noise control and ear protection are considered briefly.

Hardboard Panels for Sound Absorption at Low Frequencies. R. W. Kenworthy and E. C. Ash, Jr. Trend in Eng. (Univ. Washington) 5, 10-12, 23 (Apr. 1953).

The absorption coefficients of most commercially produced materials are much greater at the higher than the lower frequencies; therefore, the ordinary acoustic ceiling must be supplemented by other devices in order to obtain sound absorption throughout the audible frequency range. Wood panels are frequently used for the purpose, and the authors describe experiments with various types. They find that hardboard and plywood panels are similar in acoustic properties, but that unexpected variations may appear with any panel. Curved panels are noticeably superior to flat and splayed panels, especially with the addition of an absorbent backing. The best thickness for hardboard panels is apparently 1/8 inch. There are a large number of combinations of thickness, material, shape, and acoustical treatment that may be incorporated into the design of such panels. Additional tests are in progress.

Sudeck's Syndrome as an Industrial Disease. W. Grunke and C. Wieland. Deut. Gesundheitsw. 27, 863-866 (July 1952) German.

A case is described in which a woman aged 56, who, after about 2 years of daily work in a standing position for 8 to 10 hours with a knitting machine, suffered from drawing and lancinating pains in the right shoulder and arm with some limitation of movement. Rest and treatment improved her condition but relapses occurred. The symptoms included swelling of the shoulder and edema and tenderness of the arm, and some finger joints. X-ray examination showed marked bony changes in the shoulder, shaft of the humerus, radius, ulna, and some of the bones of the hand. The condition was diagnosed as Sudeck's syndrome due to long use of a knitting machine. Working the machine entails manipulation of a lever by the right arm, which is thus exposed to frequent shocks of movement and recoil. It is recommended that the (German) occupational disease law should be extended to cover this disease.

-- Cond. from Bull. Hyg.

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IN RE: ABRAMS November 1992

RADIOACTIVITY AND X-RADIATION

- 615 Radioactive Dust from Nuclear Detonations. M. Eisenbud and J. H. Harley. Science 117, 141-147 (Feb. 13, 1953).

The Atomic Energy Commission has set up a monitoring program to measure the changes in radioactivity levels throughout the United States caused by nuclear detonations. The monitoring system is described briefly, data taken after the test, in the spring of 1952, at the Nevada Proving Grounds are analyzed, and some general conclusions as to radiation hazards of fallout are drawn. Radiation doses received from settled radioactive dust are minute compared to the exposure received in a lifetime from natural sources of radioactivity.

-- Nuclear Sci. Absts.

- 616 Particle Accelerator Installations--Fire Protection. Special Interest Bulletin No. 298, National Board of Fire Underwriters, Committee on Fire Prevention and Engineering Standards, 85 John St., New York 38, N. Y. 2 pp. (April 1, 1953) Copies obtainable from the Board on request.

The principle of particle accelerators is discussed briefly, and safety directions are given for construction of buildings housing the apparatus, segregation, installation of electrical equipment, use of hazardous materials, fire extinguishing equipment, auxiliary systems and equipment, welding and cutting operations, and housekeeping. Additional recommendations apply to the use of combustible cooling oil.

- 617 Roentgen-Ray Cataract Effects of Shielding of the Lens and Ciliary Body. A. J. Alter and P. J. Leinfelder. Arch. Ophthalmol. 49, 256-260 (Mar. 1953).

Experiments on rabbits showed that roentgen rays do not cause cataract when the lens is protected by a lead shield 2 mm. thick. The actively growing equatorial portion of the lens appears to be the most sensitive to injury by roentgen rays. The pupillary zone of the lens appears to be the least sensitive. Exposure of one quadrant of the lens to roentgen rays results in opacities limited to that quadrant.

-- Authors' summary

03119579

November 1992

IN RE: ABRAMS

HMBB-0014999

- 618 Studies on the Treatment of Internal Radioactive Contamination: II. Prevention of Deposition of a Fission Product by Salts of Ethylene Diamine Tetraacetic Acid. S. H. Cohn, J. K. Gong, and M. C. Fishler. Naval Radiological Defense Lab. (USNRDL-358). (Aug. 19, 1952).

It has been demonstrated that the administration of sodium EDTA followed by calcium EDTA soon after the start of yttrium 91 injection can measurably reduce the internal radiation hazard by preventing skeletal fixation of the radioisotope. In like manner, the administration of the above salts of EDTA prior to the injection of yttrium 91 results in a skeletal yttrium concentration only a small fraction of that found in the controls. This work suggests the feasibility of a prophylactic approach to the problem of treatment of internal radioactive contamination in terms of preventing the skeletal deposition of fission products before, or soon after, exposure.

-- Nuclear Sci. Absts.

- Hematologic Studies of Irradiated Survivors in Hiroshima, Japan. Y. Yamasawa. Arch. Internal. Med. 91, 310-314 (March 1953).

The data presented here seem to indicate that radiation resulting from the explosion of the atomic bomb in Hiroshima, on Aug. 6, 1945, has not significantly varied the hematologic values as analyzed in this report over a three- to four-year period.

-- Cond. from author's summary

ENVIRONMENTAL MEASUREMENTS

- Don't Expect the Chemist to Perform Miracles. B. E. Saltzman. Occ. Health (USPHS) 13, 82 (June 1953).

It cannot be emphasized too strongly that analytical chemistry, and especially trace analysis, is highly complex and that certain requirements must be rigidly met in the sampling procedure if the analytical results are to be of value. Many difficulties will be avoided by consulting the chemist, especially during the planning stage of environmental studies. The analyst's work is made difficult by the following conditions: (1) too small samples; (2) unnecessary request for "complete analysis" or a long list of elements to be determined; (3) tests for microgram quantities of materials in samples contaminated by the container or in the presence of too large quantities of interfering substances; (4) furnishing impure sampling reagents; and (5) failure to provide full information on the nature and history of the sample. Good results under these conditions would be a miracle.

03119580

November 1992

IN RE: ABRAMS

KH88-0015000

- 621 The Role of the Emission Spectrograph in Occupational Health Investigations. R. G. Keenan. *Occ. Health Rev. (Canada)* 4, 11-14 (March 1953).

Some of the problems associated with the determination of trace quantities of metals in sample materials involved in occupational health studies are discussed. The advantages to be gained by the use of the emission spectrograph for metal analysis are pointed out, and applications to practical problems are described briefly. -- Cond. from author's summary

- 622 Analysis of Dusts and Aerosols of Toxic Minerals by Emission Spectrography. A. Berton. *Arch. maladies profess.* 13, 491-495 (1952).

Dusts or aerosols were collected by drawing air through filter paper. A strip cut from the paper was moved through an electric spark. Quantitative analysis was done from the emission spectrum by a method previously described. For sufficient accuracy on a paper strip 8 x 0.5 cm., 50 l. of air is sampled for determining chromium, cadmium, and lead, 10 l. for manganese, and 1000 l. for mercury and beryllium. The precision is ± 10 to 15%. The method is not suitable for silicates. -- Chem. Absts.

- 623 High Speed Absorber for Determination of Toxic Substances in Air. J. C. Gage. *J. Sci. Instr.* 29, 409 (Dec. 1952).

A description and performance figures are given for an impingement absorber with the jet modified so that the air entrains the absorbing liquid and an air-liquid mixture impinges on the base. This enables an air sampling rate of 5 to 10 l./min. to be used and contaminants with allowable concentrations of 5 mg./cu. m. or less to be determined.

-- Atm. Poll. Bull.

- 624 Polarographic Method in Hygienic Investigations. M. S. Bykhovskaya and M. I. Poletaev. *Gigiena i Sanit.* No. 12, 47-50 (1952) Russian.

Determination of lead in air is readily accomplished polarographically by nitric acid 5, ammonium acetate 30, and sodium acetate 1% in 1% acetic acid solution. Zinc and copper do not interfere. For separate determination of lead, zinc, and copper the 30% ammonium acetate solution is recommended at pH 6.6 - 7.0. For test samples from protective coating a 5% acetic acid washing is advised. Lead in blood is determined after destruction of organic matter, and the determination is run in 30% ammonium acetate. Small amounts of zinc, copper, and cadmium give well defined waves in ammonium hydroxide solution of ammonium chloride. -- Chem. Absts.

03119581

November 1992

IN RE: ABRAMS

ABRAMS

625

An Instrument for the Continuous Analysis of Atmospheric Fluoride.

S. W. Chaikin, C. I. Glassbrook, and T. D. Parks. Abstracts of Papers, 123rd Meeting Am. Chem. Soc. p. 21B (March 1953).

An instrument has been developed for continuous monitoring of the atmosphere around certain industrial plants for fluoride as a pollutant. It is based on the quenching by hydrogen fluoride of the fluorescence of filter paper tape impregnated with magnesium oxinate. This quenching is highly selective, and, in the present stage of development of the instrument, may be used to measure atmospheric hydrogen fluoride in concentrations as low as 30 parts per billion. The apparatus is described briefly. Studies made in connection with the development of the instrument included the preparation of atmospheres of known hydrogen fluoride for calibration, the evaluation of impregnants and tape, and accommodation for air samples of high humidity. -- Condensed

Analysis of Sulfuric Acid Contact Plant Exit Gas: Critical Review of Analytical Methods for Acid Mist and Sulfur Dioxide. J. B. Lombardo. Anal. Chem. 25, 154-160 (Jan. 1953).

A critical and extensive review of the literature on the analysis of sulfuric acid contact plant exit gas for the two important constituents, sulfuric acid mist and sulfur dioxide, disclosed the lack of a practical analytical method. Such a method is essential for the proper control of the process and evaluation of air pollution. Sulfuric acid mist in the range of 0.1 to 10 mg. per cu. ft. is determined by filtering the particles on a specially designed sintered glass unit; sulfur dioxide in the range of 1 to 100 mg. per cu. ft. is determined by oxidation by and absorption in hydrogen peroxide and subsequent titration with sodium hydroxide. The application of the proposed method has contributed materially to the intelligent control of a modern sulfuric acid contact plant.

-- Cond. from editor's summary

Rapid Determination of Lead in Old Urine Samples. Mary O. Amdur. Arch. Ind. Hyg. & Occ. Med. 7, 277-281 (April 1953).

By the extraction of old urine samples containing 10% by volume of nitric acid with n-butanol, analysis can be made for lead by the screening method of Cholak even after several months of standing. Thymol is used as a preservative. The method as used gives good agreement with two independent methods.

-- Author's summary

Colorimetric Determination of Vanadium with 8-Quinolinol. Application to Biological Materials. N. A. Talvitie. Anal. Chem. 25, 604-607 (April 1953).

A specific and sensitive method has been developed for determination of vanadium in biological materials. It is applicable to studies of the distribution and rate of excretion of vanadium in experimental animals and is useful

03119582

IN RE: ABRAMS November 1992

HWDB-0015002

in evaluating industrial exposure to vanadium compounds by analysis of urine specimens. The method is based on the measurement of the intensity of the magenta-black color of the compound of vanadium and 8-quinolinol (8-hydroxyquinoline) in chloroform medium. When the color is read photometrically, vanadium can be determined in the range of 1 to 50 micrograms with an average error of ± 0.32 microgram.

- 629 A Modification of Winnick's Method for the Rapid Determination of Ethyl Alcohol in Biological Fluids. I. Sunshine and R. Nenad. Anal. Chem. 25, 653-655 (April 1953).

A simple quantitative determination for ethyl alcohol in biological fluids is described. Such a method is obviously desirable to aid in rapidly establishing a diagnosis of alcoholic intoxication in the hospital emergency room. Earlier methods are reviewed briefly. This method employs the Conway cell and potassium dichromate as the oxidizing medium. The diffusion of the alcohol into the dichromate solution is complete in 20 minutes, and the alcohol is then determined colorimetrically.

- 630 A Rapid Screening Test for the Determination of the Approximate Cholinesterase Activity of Human Blood. G. Limperos and Katherine E. Ranta. Science 117, 453-455 (April 24, 1953).

The methods commonly used to determine blood cholinesterase activity in persons exposed to anticholinesterase compounds require apparatus found only in clinical or chemical laboratories. The authors describe a test applicable for screening purposes, so that overexposure may be detected and appropriate treatment administered with minimum delay. It is essentially a visual colorimetric method in which the change in pH resulting from the liberation of acetic acid from a cholinesterase substrate (acetylcholine iodide) is estimated by the change in color of an indicator, brom thymol blue. The color of the solution at the end of 20 minutes will determine the approximate cholinesterase activity. Only one drop of fingertip blood is required. An activity below 75% should dictate the removal of the person examined from further exposure to anticholinesterase compounds until the activity returns to normal.

ISMS--Someone has said, quite correctly, that if you want your father to take care of you--that's Paternalism; if you want your mother to take care of you--that's Maternalism; if you want Uncle Sam to take care of you--that's Socialism; if you want Uncle Joe to take care of you--that's Communism. But if you can take care of yourself--that's Americanism.

-- Lowell F. Johnson, at the First Annual
Conference on Industrial Vision,
Rutgers University

November 1992

November 1992

IN RE: ABRAMS

HHBB-0015003

03119583

PREVENTIVE ENGINEERING

How to Design Ventilation for Radiological Hazards. W. W. McIntosh.
 Heat. Pip. Air Cond. 25, 90-95 (May 1953).

Design of ventilation for radiological hazard control involves all the factors encountered in ordinary work in which noxious vapors or dangerous particulate matter is released into the ventilation air stream. The difference is principally in the degree of hazard involved and the additional refinement of design required. The foundations of successful ventilation design include wise selection of site, full consideration of ventilation requirements, adoption of a simple foolproof system, strict attention to fundamentals, careful attention to details, and preparation of drawings and specifications with more than ordinary skill and foresight. A number of installations have given satisfactory performance during several years of service. The paper gives suggestions for practical application of the principles outlined.

632 Practical Aspects of Dust Suppression. W. B. Lawrie. Natl. Safety News
67, 26, 27, 66, 68, 108-110 Feb. 1953); 28, 29, 142-145 (May 1953).
 Condensed from Brit. J. Ind. Safety.

This paper covers the field of dust control, giving most attention to features that are not often considered. Dust control includes elimination and suppression. Elimination is the ideal goal, but suppression is often the only practical procedure. One method of dust elimination is wetting the dust. The problem of avoiding dust from cleaning castings by making them in such a way that the molding material does not adhere to the steel is being investigated. Reduction of the amount of core binder is also being studied. In using general ventilation to aid in dust control, warm, sloping roofs are very desirable over furnaces or other heat sources. If the roof is flat, a false ceiling should be inserted. Down-draft ventilation should be given more consideration where no hot processes are involved. The air can enter through a perforated false ceiling. Several suggestions are made for introduction of outside air where needed, either in general ventilation or in local exhausts. The discussion of local exhaust systems includes the use of high velocity air curtains and specially designed exhaust systems where castings are poured along a conveyor belt. A new development in rapid estimation of dust from particular operations is the use of motion picture cameras. This procedure has proved useful not only in making comparative estimates of dust but also in tracing the course of the dust cloud and thereby guide the design of exhausts. Recent work by Swedish engineers has shown that the necessity of hoods over small electric furnaces may be avoided by applying a very high velocity air curtain over the

03119584

November 1992

IN RE: ABRAMS

HADB-0015004

furnace. The curtain is provided by suction fans below floor level. Ventilation problems should always be studied with reference to the individual conditions. There is a great need for careful study of exhaust hoods and of other possible methods of dust suppression. Although the text is taken from a British publication the illustrations depict American practice.

- 633 Venturi Washers for the Cleaning of Gases. R. M. G. Boucher and M. L. Franck. Ind. Chemist 29, 51-55 (Feb. 1953).

The principles underlying the agglomeration of fine particles are discussed, three available washers of the venturi type are described and compared and industrial applications are considered. The use of ultrasonics in flocculation of aerosols is discussed briefly. The two most important applications of venturi scrubbers have been the elimination of iron oxide particles from blast furnace gases and the removal of fly ash from power station flue gases.

- 634 Exhaust Odor Removed by Carbon. K. B. Magee. Heat. & Vent. 50, 107 (May 1953).

Waste non-combustible gases from a new plant using a synthetic lacquer caused an odor nuisance to the community. Catalytic burners decreased the odor level only slightly. The problem was solved by the use of activated carbon in cell-type units. The adsorbers are preceded by catalytic burners and impingement dust filters. An odor removal efficiency of over 92% is obtained. A slight negative pressure in the coating room is necessary. The area of the carbon filter units and other engineering factors were established by a thorough survey.

- 635 Wear These against Chemical Hazards. T. W. Roy, Jr. Safety Maint. & Prod. 105, 14-18 (May 1953).

Protection of the eyes against splashing or spraying of chemicals may be achieved by the use of goggles, faceshields, hoods, gas masks, airline respirators, air supply hoods, and breathing apparatus. Each type of equipment is discussed with reference to its best method of application. Brief directions are given for first aid for eye accidents.

In these good new days the average housewife, by pushing buttons and flipping switches in her home, commands 65 h.p. a day to work for her. That is the equivalent of the muscle work of 1,430 men--or that many servants, besides her husband.

-- "Valley Daily News"

COMMUNITY AIR HYGIENE

636

Fog and Deaths in London, December 1952. J. A. Scott.
Public Health Repts. 68, 474-479 (May 1953).

During the week following the fog and very low temperatures of December 5, 6, 7, and 8, 1952, abnormally large numbers of persons at all ages died from causes connected with difficulty of breathing. This was very similar to what had happened immediately after a comparable fog in 1873, but the rise in deaths in 1952 was much greater and was, in fact, as great as that during the worst week of the last cholera epidemic.

-- Author's summary

637

Report of Results of Sampling the Atmosphere in the Detroit River Area during 1951. G. D. Clayton and P. M. Giever. International Joint Commission, Technical Advisory Board on Air Pollution, United States Section. 52 pages plus charts. (March 1, 1953).

This report presents the results of an extensive air pollution survey of the Detroit area, as part of the international project. For particulate matter, high-volume air sampling instruments were placed in selected areas. In addition to dust counts and total weight determination, the samples were analyzed quantitatively and semiquantitatively for 24 elements. For some elements and compounds, analytical procedures were developed. Sulfur dioxide concentrations were recorded by two mobile samplers. The sulfur dioxide survey occupied all of 1951 and part of 1952. The intensive part of the particulate matter survey was made during a period of 50 days in May and June, 1951, involving 33 to 42 tests in each of 28 areas, and was supplemented by tests during other periods. The results for each location are given in considerable detail, and maps and charts show the distribution of pollution. It is shown that sources of intensive pollution affected the sample weights within a mile of the respective sources. The results, briefly, indicate: a usual range of 100 to 350 micrograms of particulate matter per cubic meter; median dust count 0.7 mppcf; median particle size 0.94 micron; 70% of the sulfur dioxide readings were under 0.1 ppm. The extent of pollution varied greatly with wind direction, and concentrations were lower during rain. With those exceptions, however, little or no correlation was found between degree of pollution and amount of rainfall; between total particulate matter and quantities of any particular element or compound; or between particulate matter and sulfur dioxide concentrations. It is concluded that no one contaminant can be isolated to be used as an index to total pollution.

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IN RE: ABRAMS November 1992

November 1992

ABRAMS

IN RE:

- 638 Evaluating Sources of Air Pollution. G. P. Larson, G. I. Fischer and W. J. Hamming. Ind. Eng. Chem. 45, 1070-1074 (May 1953).

The Los Angeles air pollution research and control plans have emphasized the need for combining general air sampling with measurements on local sources of air pollution by direct sampling and detailed investigation of operations, industrial or domestic, leading to air-borne wastes. The authors have explored these three fields of investigation in the Los Angeles area. Tables show the concentrations of the various pollutants in the area, the data developed from special studies and field tests, daily production and consumption of various fuels and estimated emissions of aerosols, acid gases, aldehydes, and hydrocarbons. From the carbon monoxide level found in the air and the total estimated emission, the dispersion volume for particular meteorological conditions was calculated. Using this dispersion volume, the atmospheric concentrations of sulfur dioxide and of oxides of nitrogen were calculated, for periods of good visibility and of intense smog. The values obtained were in reasonable agreement with those actually measured. Application of the same calculations to other gaseous pollutants gave agreements within at least the order of magnitude. Similar calculations for aerosols give values higher than those actually measured, partly on account of settling of large particles. The relation of concentrations of aerosols to visibility is discussed, and indices for several aerosols are calculated. The reduction in pollution since 1948 and future control measures are discussed briefly. The role of oxides of nitrogen in smog formation is being studied.

- 639 Recent Developments and Progress in Air Pollution. A. D. Brandt. Paper 52-A-70 to Am. Soc. Mech. Engrs. (Nov.-Dec. 1952).

The effects of atmospheric pollution are divided into five groups, nuisance, economic, effect on health, on vegetation and on animals, and each group is commented upon. Measurement and analysis of pollution and the effects of meteorology and topography upon pollution are considered. Control of air pollution by various means, i. e. substitution of prime movers, conversion of pollutant to a less obnoxious one, dust removal equipment and flue gas scrubbers, are discussed. -- Atm. Poll. Bull.

- 640 Measurement of Dust Fall Rates Using Greased Plates. R. R. Paxton. Abstracts of Papers, 123rd Meeting Am. Chem. Soc., p. 19B (Mar. 1953).

The rate of dust fall from the atmosphere is ordinarily measured by setting out water-filled jars. The advantages and disadvantages of substituting vaseline-coated glass plates for the water-filled jars are discussed. The technique of preparing and mounting the plates for exposure is described. Methods of examining and quantitatively determining the amount of dust on the exposed plates are also described. -- Entire abstract

03119587

NWB-0015007

- 641 Atmospheric Pollution Measurement by Ultraviolet Photometry. D. J. Troy.
Abstracts of Papers, 123rd Meeting Am. Chem. Soc. pp. 21B-22B (Mar. 1953).

Experience in the use of a highly sensitive, portable photoelectric photometer for direct measurement of the ultraviolet-absorbing contaminants in air is described. Substances measured included chlorinated ethylenes, benzene, toluene, nitrobenzene, acetone, carbon disulfide, cymene, and dimethyl formamide. The photometer, which is a modification of a design previously described by V. F. Hanson, is capable of reliable operation at full-scale absorbances between 0.0005 and 0.05. Characteristics and calibration of the instrument are discussed. The apparatus can supply a continuously flowing standard gas sample at a rate of 500 ml. per minute for periods up to 30 minutes. Concentrations available are 0.2 ppm to 20% by volume for gases in air, or 0.1 ppm to saturation for vapors in air. -- Condensed

- A Continuous Oxidant Recorder. F. E. Littman and R. W. Benoliel.
Abstracts of Papers, 123rd Meeting Am. Chem. Soc., p. 20B (March 1953).

An oxidant which appears to be ozone is characteristic as a pollutant of Los Angeles air. In order to study the relationship between the concentration of smog and the fluctuation of the oxidant concentration, a continuous recorder was built, which produces a direct-reading record of the oxidant concentration in terms of ozone equivalents. The instrument consists essentially of a continuous air-liquid contacting device and a recording colorimeter. It is based on the liberation of iodine from a buffered, neutral potassium iodide solution by the oxidant. The contacting solution is regenerated by passing it through a bed of activated carbon. The instrument is calibrated directly in terms of ozone equivalents in parts per 100 million of volume. Satisfactory performance over a period of 18 months was achieved and an excellent positive correlation was established between the oxidant and smog, as manifested by reduced visibility, eye irritation, and crop damage. -- Condensed

- 642 Measurement of Atmospheric Turbulence. M. Pelegrin.
Compt. rend. 235, 19-21 (July 1952).

An electrical method of measuring the speed of air movement is described and fine scale movements are obtained by hot wire detectors. Zones of turbulence ranging from zero to speeds of 4 to 5 meters per second within linear distances of 7 meters are found with violent local squalls of smaller scale in which the speed can be 10 meters per second. The coefficient of turbulence can be obtained from photographic registrations in addition to the spectrum of turbulence. -- Atm. Poll. Bull.

03119588

IN RE: ABRAMS November 1992

HBB-081508

MANAGEMENT ASPECTS

November 1992

IN RE: ABRAMS

- 644 Employee Benefit Plans Providing Hospital, Surgical, Medical Care.
Publication No. 88, Research Council for Economic Security, 111 West
Jackson Blvd., Chicago 4, Ill. 16 pp. (1953) \$1.00.

Hospital, surgical, and medical care provisions of 54 plans are tabulated in this study. Companies covered in the tabulation range in number of employees from 200 to almost 200,000. The data in the tables include type of carrier, employee coverage, cost to employees, waiting period, amounts and types of benefits, coverage of dependents, and conversion and post-employment privileges.

- 645 Employees Handle Restaurant Complaints. Doris M. Thompson.
Mgmt. Rec. (Natl. Ind. Conference Board) 15, 138-139 (1953).

In connection with the restaurant maintained by Northwestern Mutual Life Insurance Co., a committee of employees help to explain to other employees company practice relating to the serving of meals. The committee also helps to communicate employee thinking to management. Several typical complaints and questions with replies are given.

- 646 Current Trends in Hospital-Surgical-Medical Plans. Mgmt. Rec...
(Natl. Ind. Conference Board) 15, 126-133, 152-158 (April 1953).

The recent rise in the cost of hospital and medical care is of deep concern. Almost as dramatic is the increase in the number of people who are covered by some form of protection against these costs; three fourths of this coverage is through group plans. Many companies are reexamining their plans to determine whether the benefits provided are substantially meeting the needs of their employees. Three papers are presented, approaching the problem of hospital-surgical-medical benefits from different angles.

New Health Insurance Plans. Lois E. Forde (of the Conference Board staff) -- This article analyzes the group insurance plans of 67 companies for the purpose of discovering what types and amounts of benefits are now being provided in the fields of hospital, surgical, and medical care. The figures are tabulated and compared with those of 1949. Special features of some company plans are described.

Personal Catastrophe Coverage. W. C. Lochmoeller. -- Catastrophe insurance is a new type, intended for protection against the financial catastrophe which befalls an individual who has a serious illness or injury, where his medical expenses reach staggering proportions. Most of these

expenses are beyond the scope of the average plan. The author describes the plan developed by Sears Roebuck & Co. in addition to ordinary coverage. At present it is limited to employees and costs the employee about 40 cents per month each. It was enthusiastically received. It has been in operation only four months, but about 25 claims have been paid, and the plan has been found simple in operation. The benefits cover 75% of the medical expenses above a deductible amount depending on the employee's salary, up to a maximum of \$5,000.

Coverage for Hospitalized Employees. E. S. Willis. -- The experience of General Electric Company in developing surgical and hospital insurance is described, and recommendations are made on the basis of that experience. All plans should be contributory, and should not cover all hospital and medical expenses. Catastrophe insurance is now included; the company pays 75% of extra hospital costs. Maternity benefits are included. Hospital coverage for pensioners is in the experimental stage. Whenever costs greatly exceed premiums in any feature of the plan, an investigation is made and the plan readjusted if necessary.

Union and Union-Management Administered Health Insurance Plans in New York State, January, 1951. New York State Dept. of Labor, Division of Research and Statistics. 59 pp. (1951).

This publication presents a summary of the terms of collectively bargained health insurance plans (in New York State) that are administered to some degree by a union or by a union and management jointly. The number of such plans in January, 1951, was 306, as compared with 168 in January, 1949. Most of the programs operate in small companies who bargain on a multi-employer basis. Multi-employer funds are maintained in many cases. Cash disability benefits are provided in 90% of the plans; hospital benefits in 93%; surgical benefits in 85%; maternity benefits for women members or wives of members in 71%; and medical care or cash medical benefits in slightly over one-third. All but 17 of the 306 health plans are financed entirely by the employers. In 11 of the others the employees pay only the extra costs for hospital or surgical benefits for their dependents. Of the programs offering cash disability benefits, 83% provide maximum benefits over \$25 per week, and 36% provide \$30 per week or more. Most of the hospital benefit plans follow Blue Cross arrangements. Only 4% provide full surgical service. The rest reimburse for any surgical operation according to regular rates, with stated maximums. Most of the plans (11 out of 12) require union membership as a condition of eligibility, and nearly all require that a worker be employed by a contributor to the fund. A number of other details are given, and the 306 plans are tabulated. (This report is now out of print, but there have been several references to it in other reports and papers.)

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- 648 Industrial Workers. From a Report to the President by the Commission on the Health Needs of the Nation. Ind. Med. & Surg. 22, 207-210 (May 1953).

This is a reproduction of the chapter on "Industrial Workers" in Volume 2 of "America's Health Status, Needs, and Resources." The present status of industrial health is reviewed briefly and a number of recommendations are made. The report includes socio-economic aspects and has controversial features, hence should be read in its entirety. (Also see editorial in the same issue of the journal, pp. 234-236).

ACCIDENTS AND PREVENTION

- 649 The Spontaneous Ignition and Dust Explosion Hazards of Certain Soybean Products. R. E. Dufour and C. C. Clogston. Bulletin of Research No. 47. Underwriters Laboratories, Inc., 207 East Ohio St., Chicago 11, Ill. 26 pp. (Feb. 1953) Obtainable at above address on application.

This Bulletin reports an investigation on the spontaneous ignition and dust explosion hazards of certain soybean products, including oils, meals, and flour. Dusts and screenings were also included in the investigation. Spontaneous explosion tests were conducted with relatively large samples at an ambient temperature of 99°C (210°F). The soybean oils, including crude and refined oils at various stages of manufacture, heated spontaneously and ignited at that temperature. The spontaneous ignition hazards of soybean oil meals and soy flours appear to depend primarily upon the amount of soybean oil present in those products. Screenings from soybeans may present a spontaneous ignition hazard under some circumstances, depending on the amount of soybean oil and other combustible material present in the screenings. Dust explosion tests on the meals, flours, dusts, and screenings showed that, like other solid combustible agricultural products, they are capable of propagating flame (explosion), when disseminated in air in sufficient quantities in the presence of an adequate source of ignition. -- Cond. from authors' abstract

- 650 Fire Causes--Statistical Classification. Special Interest Bulletin No. 296, National Board of Fire Underwriters, Committee on Fire Prevention and Engineering Standards, 85 John St., New York 38, N.Y. 1 p. (1953). Copies obtainable from the Board on request, with an index for assigning codes.

A new classification of fire causes, developed by the National Board is presented in order to give better information as to the cause of each fire. The first group of titles represents causes of ignition and the second a classification of material ignited. It will be advantageous for fire chiefs to keep

03119591

November 1992

IN RE: ABRAMS

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the classification in mind and to make every effort to determine the cause of ignition and material ignited for each fire.

Extinguishing Power of Powders in Flames and Explosions. C. Dufraisse, J. LeBras, and M. German. Compt. rend. 164-167 (1953). French.

The minimum quantity of various powders which will extinguish stationary flames of illuminating gas is determined; the most effective pure powder is potassium oxalate. Addition of 10% silica to the oxalate increases the extinguishing power markedly. A mixture of 30% potassium oxalate and 70% sodium bicarbonate is somewhat more effective than the pure oxalate. Flames of carbon monoxide or methane are extinguished by smaller weights of powder than illuminating-gas flames, while hydrogen flames require larger weights. Other experiments are described in which a flame passing through a tube 6 cm. in diameter at several meters per second is made to encounter a dust cloud which may or may not stop the flame. While as much as 4 grams of talc will not stop the flame, its progress is arrested by as little as 300 mg. of potassium oxalate plus 10% silica, or 400 mg. of potassium nitrate plus 10% silica, or 150 mg. potassium fluosilicate. Strangely, potassium fluosilicate is distinctively less effective than potassium oxalate in stationary flames.

-- Chem. Absts.

652 Ammonium Nitrate Explosions. A. Haid and H. Koenen. Chem. Ztg. 76, 471-475 (1952). German.

The effects of heating ammonium nitrate were investigated. At 170 to 250°C decomposition into water and nitrous oxide predominated. At higher temperatures it sublimed more rapidly than it underwent the foregoing decomposition and dissociated into ammonia and nitric acid; the latter dissociated further to nitrogen oxides. The gas mixture was ignitable at approximately 290° and inflamed spontaneously at approximately 450°. Very rapid heating in vessels with constricted openings led to explosions. Heating 500 g. of ammonium nitrate in direct contact with flame resulted in melting and sublimation but no ignition. Heating a 50 kg. sample in a paper sack with direct flame burned the sack and melted part but did not ignite the sample. Strong heating of 100 g. in an iron dish led first to sublimation and decomposition and then to ignition of the decomposition products, which burned explosively. Dropping 5 g. portions on a glowing iron dish gave rapid ignition and decomposition but no sublimation. In general explosion occurred only when confinement prevented the escape of heat and decomposition products, whereby the decomposition rate was continuously accelerated.

-- Chem. Absts.

03119592

November 1952

IN RE ABRAMS

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- 653 Explosion Hazards of Ammoniacal Silver Nitrate Solutions. H. Vasbinder. Pharm. Weekblad 87, 861-865 (1952). Dutch.

Two instances of explosion of ammoniacal silver solutions are described. A marking ink consisting of a mixture of solutions of silver nitrate, ammonia, sodium carbonate, and gum arabic exploded when warmed. A second explosive solution was made by precipitating silver oxide from silver nitrate solution with sodium hydroxide, washing the silver oxide, dissolving it in ammonium hydroxide, adding a few drops of silver nitrate, until a permanent precipitate was formed, and then centrifuging. On two occasions this solution, which should be stable for several months in tightly stoppered bottles in the dark, exploded in 10 to 14 days, once quite violently. The explosion is ascribed to the precipitation of silver imide by the reaction of silver ammonia hydroxide. Silver imide is very sensitive to heat and shock even when wet. -- Chem. Absts.

MISCELLANEOUS

- 654 Climate and Endemic Dental Fluorosis. D. J. Galagan and G. G. Lamson, Jr. Public Health Repts. 68, 497-508 (May 1953).

The prevalence and severity of dental fluorosis in 726 children were studied in six Arizona communities. The cities are located in a desert area with extremely high daytime temperatures and low humidities. In water supplies of these communities, concentrations of fluoride above 0.8 ppm resulted in objectionable dental fluorosis; concentrations of 0.6 to 0.8 ppm resulted in an occasional diagnosis of fluorosis; and there were no cases at lower concentrations. Fluorosis occurs at about twice the intensity in that section of Arizona as it does in the midwestern area with comparable fluoride concentrations but markedly different climatic factors. The application of a simple biological test in two areas shows that, because of several climatological influences, Arizona children drink more water than children living in more temperate climates. As a result, there is increased ingestion of fluoride in relation to the concentration found in the water supply.

-- Cond. from authors' summary

- 655 Legal Aspects of Water Fluoridation. W. H. Bell. Modern Sanit. 5, 61-66 (March 1953).

~~Only three~~ suits have been brought against municipalities to enjoin the practice of fluoridation of water. Fluoridation was sustained in all three instances. A summary of the decision in each case is presented. The opinions

03119593

November 1992

IN RE: ABRAMS

all concur in stating that no right of the individual is infringed. Religious objections are considered in two cases; here again the decisions were that there was no interference with liberty of religion. The recommendation of Public Health Service and the favorable opinions of at least 95% of competent scientists are among the deciding factors in establishing the legality of fluoridation.

656 Fact Book on Aging. Federal Security Agency, Committee on Aging and Geriatrics. 62 pp. (1952). For sale by Supt. of Document, U. S. Govt. Printing Office, Washington 25, D.C. 30 cents.

This Fact Book contains most of the basic information needed for an understanding of the size, distribution, and characteristics of the aging population of the United States. As such it should fill a fundamental need for background knowledge on a subject of growing interest to all thoughtful citizens. It consists of 21 charts and 35 tables, including increase in aged population, classification by sections of the country, sex, family status, income, source of income, employment, chronic disease, disability, financial and medical protection, and other features.

657 Workmen's Compensation Board, State of New York, Annual Report, 1952. Mary Donlon, Chairman. 60 pp. (1953).

The most serious problem confronting the board is the increasing cost of compensations, and the first section of the report deals with its causes, the studies that are being made, and recommendations for dealing with it. The situation is in part the consequence of full employment, in part because more workers know better how to assert their social insurance right, and in large part, to developments in medical science. The increased benefits are higher in cases conducted by insurance carriers than among self-insured companies. Reasons and remedies for this situation are discussed. Other developments considered are the increasing recognition of health insurance benefits for non-occupational disabilities and increasing needs of compensation for civil defense workers. The following sections review the work of the Board for the year, and give extensive statistics. Significant legislation in New York for the year is reviewed. Eleven amendments to the Workmen's Law were passed. There were 184 bills that were not passed, but each required study by the Board. Appended to the report is "An Evaluation of Carrier Performance, January-June, 1952." Satisfactory progress is being made, but some carriers, as in previous reports, are criticized for undue delay in making payments.

03119594

IN RE: ABRAMS
November 1992

INDEX

<u>Aging</u>		<u>Code for dust and fumes</u>	
fact book	656	South Africa	565
<u>Air analysis</u>		<u>Dental fluorosis</u>	
high speed absorber	623	effect of climate	654
<u>Air pollution</u>		<u>Dermatitis</u>	
evaluating sources	638	overtreatment	569
measurement, photometric	641	<u>Dermatoses</u>	
recent developments	639	occupational	567
survey, Detroit	637	<u>Dinitro cresol</u>	
<u>Aldrin, toxicity</u>	591	absorption and excretion	589, 590
<u>Altitude</u>		<u>Dust and aerosols</u>	
and lung volume	607	spectrographic determination	622
<u>Ammonium nitrate explosions</u>	652	<u>Dust</u>	
<u>Anthracosilicosis</u>		control in mines	597
in foundry employee	600	fall, measurement	640
<u>Asbestos</u>		suppression,	
and lung cancer	605	practical aspects	632
<u>Asbestosis</u>		<u>Employee restaurant complaints</u>	645
pathology	604	<u>Ethyl alcohol determination</u>	
<u>Atmospheric turbulence</u>		in biological fluids	629
measurement	643	<u>Eye protection</u>	
<u>Atom bomb</u>		from chemicals	635
blood effects	619	<u>Fire causes</u>	
<u>Aviation toxicology (Bk. Rev.)</u>	559	classification	650
<u>Benefit plans</u>		<u>Flame extinction by powders</u>	651
current trends	646	<u>Fluoridation of water</u>	
for employees	644	legal aspects	655
<u>Beryllium poisoning</u>		<u>Fluoride</u>	
experimental	571	continuous air sampling	625
<u>Cadmium poisoning</u>		<u>Fog and deaths in London</u>	636
chronic, prognosis	572	<u>Formaldehyde</u>	
<u>Carbon dioxide</u>		from glue in air	582
and respiration at altitude	606	<u>Foundry dust</u>	
<u>Carbon tetrachloride poisoning</u>	580	silicosis and siderosis	599
lung effects	579	<u>Gas cleaning</u>	
<u>Carnotite ore dust</u>		by venturi washers	633
toxicity	577	<u>Gas industry</u>	
<u>Cement dermatitis</u>	568	health of workers	595
<u>Chemical analysis</u>		<u>Glycerin</u>	
difficulties	620	natural and synthetic	
<u>Chloronitrobenzene poisoning</u>	588	toxicity	583
<u>Cholinesterase</u>		<u>Health audit</u>	
determination in blood	630	by questionnaire	560
<u>Chromate dermatitis</u>		<u>Health plans</u>	
from cement	568	union-managed	647
<u>Chromate industry</u>		<u>Heat exposure control</u>	608
health of workers (Bk. Rev.)	556		

03119595

MHBB-0815015

<u>Individual and community health</u> (Bk. Rev.)	557	<u>Preventive medicine</u> textbook (Bk. Rev.)	558
<u>Industrial medical services</u> in Pennsylvania	563	<u>Radioactive contamination</u> internal	618
<u>Industrial medicine</u> for general practitioner	566	<u>Radioactive dust</u> from nuclear detonations	615
<u>Industrial workers</u> Report, President's Commission	648	<u>Radiological hazards</u> ventilation for	631
<u>Insecticide</u> and rodenticides	587	<u>Rehabilitation services</u> British study	564
health evaluation	586	<u>Retirement</u> medical preparation	561
solvents, toxicity	585	<u>Roentgen-ray cataract</u>	617
<u>Lead</u> determination in urine	627	<u>Silicosis from</u> diatomaceous earth	598
<u>Lead workers</u> medical supervision	573	<u>Silver ammonia solutions</u> explosion hazards	653
<u>Manganese poisoning</u> in mines	575	<u>Soybean products</u> explosibility	649
<u>Medical supervision</u> mining apprentices	562	<u>Sound absorption</u> by wood panels	613
<u>Metal determination</u> spectrographic	621	<u>Sudeck's syndrome</u> as industrial disease	614
<u>Metals</u> polarographic determination	624	<u>Sulfuric acid mist</u> determination	626
<u>Methyl bromide poisoning</u>	587	<u>Systox, toxicity</u>	584
<u>Mercury poisoning</u> in dentists	576	<u>Teflon</u> inhalation hazard	592
<u>Noise</u> problem in industry	612	<u>Temperature adjustment</u> men and women	609
<u>Odor</u> removal by carbon	634	<u>Tetraethyl lead</u> examination of workers	574
<u>Oxidant recorder</u> continuous	642	<u>Vanadium</u> aerosol hazards	578
<u>Ozone hazard in welding</u>	570	colorimetric determination	628
<u>Particle accelerator</u> installations	616	<u>Vision</u> industrial conference	610
<u>Phagocytosis, study</u>	602	<u>Wax crayons</u> poisoning	593
<u>Plasticizers for food wrapping</u> toxicity	581	<u>Welding with inert gases</u>	570
<u>Pneumoconiosis</u> coalminers'		<u>Workmen's Compensation Board</u> New York, Annual Report,	
heart effects	601	1952	657
diagnosis	603		
<u>Polystyrene industry</u> hazards	594		

03119596