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Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL . . . decisions and trends

JANUARY, 1956

(Vol. 20, No. 1)

INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE -- PITTSBURGH 13, PA.

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FOUNDATION FACTS

Foundation Facts is a monthly news-letter issued to industrial concerns holding membership in Industrial Hygiene Foundation. The Foundation is a nonprofit association of industries for the advancement of healthful working conditions.

HHBB-0016415

Volume 18

January, 1956

No. 1

NEW MEMBERS OF I-H-F

The Foundation starts the year with four new member companies on its roster. They are:

Detroit Steel Products Company
Dow Corning Corporation
Pennsylvania Manufacturers' Association
Casualty Insurance Company
Standard Oil Company of Indiana

DR. BRAUN PARTICIPATES IN PANEL DISCUSSIONS

Dr. Daniel C. Braun, Medical Director of the Foundation, participated in a program on Absence from Work Due to Nonoccupational Illness and Injury, which was a part of the 16th Annual Congress of Industrial Health held in Detroit on January 23 and 24. The program had special reference to integration between industrial physicians and private practitioners and was arranged by the Committee on Medical Care for Industrial Workers, which is a joint committee of the Council on Medical Service and the Council on Industrial Health of the American Medical Association. Dr. Braun's specific topic was "How Can We Make Better Use of Records?"

Dr. Braun also participated in the Seventh Annual Ann Arbor Discussion on Occupational Health held at the University of Michigan on January 20 and 21.

SPECIAL SERVICES TO MEMBERS

There was a considerable increase in the number of requests for reprints and for other information on published literature during 1955. Five thousand pieces of technical literature were mailed upon request, representing 94 different reprints from the Foundation's stock of such material available to members. This did not include literature on technical aspects of industrial health which were routinely distributed to the membership, as well as the monthly Industrial Hygiene Digest and the Transactions of the annual meeting.

More members took advantage of the technical advisory service of the Foundation's staff as well. "Consultation" by correspondence on specific industrial health problems encountered by member companies was supplied in 120 instances. Inquiries sought answers to the toxicity of a wide variety of chemicals and other compounds, hazards encountered in their use, and methods of controlling those hazards; general information on air pollution, as well as data on legislation and on dust sampling equipment and methods; effects of radiation and protection against it; dermatitis from specific substances; medical programs and health maintenance techniques; mental health in industry; and a host of other subjects.

DECENNIAL INDEX OF DIGEST

To increase the value of Industrial Hygiene Digest as a reference tool for those in the field of industrial health, a cumulative index on the subject matter abstracted in the Digest for the years 1945-1954 was prepared, supplementing the yearly indexes for that period. Copies have been distributed to all representatives of member companies who regularly receive the Digest.

I-H-F

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- 22 Annual Report of the Bureau of Industrial Hygiene, 1954. Baltimore City Health Department. C. E. Couchman, Director. 10 pp. (1955).

The special investigations conducted during the year included: a survey of radioactivity in a building vacated by a clinic; a search for lost radium; radiation studies of isotope users; a study of a defective stack on an annealing furnace which was responsible for cases of carbon monoxide poisoning; two studies of polystyrene vapors; and several other studies involving toxic material. In addition, a large number of routine studies were made and tabulated.

- 23 Annual Report for 1954, Research Institute for Public Health, T.N.O., 12, Konigskade, The Hague, Netherlands. 36 pp. (1955). Dutch with English summary.

The activities classified as industrial hygiene include: comparison and testing of thermal precipitators in a provisional dust chamber; construction of a portable apparatus based on the same principle, for preliminary dust surveys; development of an instrument for the determination of quartz; construction of a sedimentation apparatus with an electrical-optical system for determination of size distribution, and design of an instrument for determination of dust content in tubes; and development of instruments for carrying out climatological determinations in factories where work is done at high temperatures. Investigations on noise and on noxious dust concentrations were also conducted.

- 24 Health Survey in a British Guiana Mining Community. Eileen N. Cambon and K. G. Cambon. Arch. Ind. Health 12, 539-542 (Nov. 1955).

A study of 1730 employees of a bauxite mining and milling community in the interior of British Guiana reveals that, in general, their health is good. The largest public health problems are venereal disease, nutrition, and personal hygiene in the prevention of helminthic infestation. Difficulties in solving these problems are discussed. Malaria has been nearly eliminated, but its eradication has increased the necessity of correcting the other conditions.

SKIN DISEASES AND BURNS

- 25 Industrial Dermatitis. A. Bell. New Zealand Med. J. 54, 476-481 (Aug. 1955).

In New Zealand, as elsewhere, dermatitis is the commonest industrial disease. The author presents a number of cases of varied industrial origins, including: arsenic-treated grain distributed from airplanes to exterminate rabbits; contact with contaminated tools; dust and fumes; and defective personal protective equipment. The best method of prevention is modification of the process or equipment so as to avoid exposure; examples are given in the cases of the exposures described. Frequently, however, the only way to prevent contact is the use of protective clothing and equipment, which should be regularly inspected and cleaned. An intact skin is a strong defense. The importance of treating even the most trivial injuries cannot be overstressed. Barrier creams may help to reinforce this defense but their importance should not be overrated. There are many types of creams and the correct choice must be made. Washing facilities should be of a good standard, easily accessible, and clean. The efficiency of hand washing may be checked by the use of fluorescent oils and examination under ultraviolet light. Medical personnel should familiarize themselves thoroughly with details of manufacturing processes, and teamwork is needed in discovering causes of dermatitis and adopting preventive measures.

03120125

- 26 Dermatitis from Solutions of Sodium and Calcium Chloride in the Coal-Mining Industry. O. P. Edmonds. Brit. J. Ind. Med. 12, 320, 321 (Oct. 1955).

An outbreak of industrial dermatitis due to brine (calcium chloride) is described in sinkers, and an account is given of industrial dermatitis due to solutions containing chlorides at another large factory. The importance of the harmful effects of chlorides is emphasized in view of their increasing use underground to allay the dust.

-- Author's summary

after layoff. There was considerable variation in specifying the length of layoff and in choice of doctor. All the companies pay for the examination, but only one pays the employee for the time spent. (An earlier survey described the practices of a number of large companies.)

- 17 The Action of Dusts and Pharmacological Agents on Respiration. Part I. The Influence of Training on Vital Capacity and Maximum Expiration per Second. A Minette and J. Pestiaux. Report No. 125, Institut d'Hygiene des Mines, Hasselt, Belgium. 16 pp. (Feb. 1955). French.

Successive tests of vital capacity and pulmonary ventilation show an increase in vital capacity and maximum expiration per second, amounting on the average to 6%. These increases are attributed partly to apprenticeship and partly to training. These phenomena should be taken into account when testing the effect of drugs or dust exposure upon lung function. -- Cond. from Bull. Hyg.

- 18 Testing Apparatus for Intermittent Positive-Pressure Respiration. J. M. K. Spaulding and S. A. Young. Lancet 269, 227-230 (July 30, 1955).

Apparatus for providing artificial respiration by intermittent positive pressure must be thoroughly tested before being approved for clinical use. A "model lung" is described which is suitable for the laboratory testing of such apparatus. Investigations with this model and clinical experience demonstrate the advantages of a square pressure wave-form for the inspiratory phase. -- Authors' summary

- 19 Older People and Heavy Work. R. M. Belbin. Brit. J. Ind. Med. 12, 309-319 (Oct. 1955).

A general tendency is noted for older people to be placed on heavy work, especially on non-production jobs. Several reasons are given for this practice. The findings suggest some difficulty in the application of the commonly accepted formula that older people should be given light work. Improvement in the level of skill of older workers would appear to offer more promising hope of employment in later life than would the increased provision of light work, and the need for the development of facilities for training and retraining older workers is emphasized. -- Cond. from author's summary

- 20 Arteriosclerotic Hearts at Work. H. Hansen and N. K. Weaver. Med. Bull. (Standard Oil N. J.) 15, 84-95 (July 1955).

A method for the placement of partially disabled employees in job assignments, based on matching the physical capacities of the employee with the physical demands of the job, is presented. The work and health status of 82 patients with arteriosclerotic heart disease at the Esso Refinery at Baton Rouge are reviewed. -- Authors' summary

- 21 The Electrocardiogram in the Examination of the Industrial Worker. J. R. Durham and L. C. McGee. Ann. Internal Med. 41, 918-934 (1954).

The work record and longevity of a group of industrial workers showing electrocardiographic abnormalities were examined. Serial electrocardiograms are useful in showing alterations in cardiac mechanism, conduction and ventricular strain, and in demonstrating myocardial ischemia and necrosis. They were of little help in determining etiology of heart disease, and were of no value to prognosis or functional capacity. The records aided appreciably in reassuring the worker with inconsequential signs and symptoms, and in obtaining his cooperation for treatment or modification of working and living habits in the presence of potential or actual heart disease. Myocardial infarction is frequently unrecognized and has a better prognosis than some hospital statistics indicate. There is no evidence in this study that physical labor or unusual effort predisposed to myocardial infarction or worsened hypertensive disease. Under proper job placement and satisfactory mental and emotional states the prognosis of the worker with degenerative vascular disease is better than that of the man who ceases work upon recognition of the disease. It is suggested that management, labor unions, compensation commissions, and others concerned with the best use of the productive capacities of handicapped workers become better acquainted with the issues involved and the natural history of cardiovascular disease. -- Cond. from authors' summary (Biol. Absts.)

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premium dollar; (3) selected statutory and administrative provisions which may affect losses incurred; and (4) official medical fee schedules and related directives. The material of the study is from 39 selected jurisdictions. Statistical tables covering a period of ten years were supplied by the National Council on Compensation Insurance. The first few pages present general comments on the economics of workmen's compensation, a table of premiums earned and losses incurred, a source list, and a glossary. The remainder of the publication presents summary tables of workmen's compensation experience of insured employers in all jurisdictions and of official medical fee schedules and directives.

-- FFR

13 Absenteeism. Research Council for Economic Security, 111 West Jackson Blvd., Chicago 4, Ill. 87 pp. (1955).

This book contains a report of the discussion at the Seminar and Workshops, Highland Park, Ill., Nov. 22-23, 1954, with selections from the exhibits used and additional specially adapted source material. The summary of the discussions include: identifying and measuring absenteeism, evaluating the absentee records, control of absenteeism, controlling and preventing illness absence, and employee benefit plans. The exhibits are forms for the following: simple attendance record, absentee control procedure, reporting of illness absences, illness absence data for the medical department, measuring the cost of absenteeism in two companies, department comparisons, company medical facilities and program, provisions of employee benefit plans, adequacy of those plans, and their evaluation in the individual establishments. Among the recommendations and conclusions are: (1) adequate records of absenteeism should be made by every company, and a general agency should make available national summaries; (2) the real causes of absenteeism are many, and there is no simple solution; (3) a medical program should include periodic examinations, follow-up of illnesses, and assisting workers in securing proper medical care; (4) employee benefit plans should be carefully evaluated to determine how they can be made effective aids in the absenteeism control program; and (5) benefits should not be confined to physicians' services in connection with surgical procedures, but should cover prolonged disabilities. Other specific needs and gaps in present plans are discussed.

-- FFR

INDUSTRIAL MEDICAL PRACTICE

14 Epidemiology in Occupational Medicine. J. J. Phair. J. Am. Med. Assn. 159, 1105-1109 (Nov. 12, 1955).

The stimulation in the epidemiological type of medical research must be considered and accepted as a unique and peculiar function of the industrial physician because: (1) such investigations approach the problems of industry and of the community from precisely the angle of most interest to him; and (2) he and his department have a virtual monopoly on the facilities and records required for systematic studies in this field.

-- Cond. from author's summary

15 Planning a Health Center. R. MacDiarmid. Med. Bull. (Standard Oil N. J.) 15, 96-105 (July 1955); Ind. Med. & Surg. 24, 540-545 (Dec. 1955).

The importance of the proper placement of the various units of a medical department is discussed. Through presentation of illustrations of the architect's original and revised plans, the value of consultation and cooperation between the architect and the medical department has been noted. The paper is accompanied by floor plans and brief descriptions of seven of the company's medical headquarters.

16 Physical Examinations after Absence and Layoff. Doris M. Thompson. Mgmt. Rec. (National Industrial Conference Board) 17, 360-361 (Sept. 1955).

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Twelve small companies with no medical departments were questioned regarding their policy in physical examinations after absence and layoff. Ten require examinations after illness, and eight

8 Occupational Disease—Exposure to Anthraco-Silicosis—Claim for Death Benefits—Occurrence of Death Not within Statutory Period.

A claim for death benefits by a widow of an employee who died of anthraco-silicosis was denied where the death of the employee did not occur within the three year statutory period after his last exposure to the hazard. The employee worked in the employer's mines from 1944 to 1948 during which time he was exposed to the anthraco-silicosis hazard. From 1948 to 1952, the employee worked outside the mines and was not exposed to the hazard. No claim was filed during his lifetime. The statute provides that no benefits are allowable if death does not occur within three years after the date of the deceased's last employment in a hazardous occupation. Since death occurred more than three years after exposure to the hazard, the award of the board was not justified under the statute and it was reversed by the trial court. The judgment of the lower court was affirmed. Gawlick v. Glen Alden Coal Co. Pennsylvania Superior Court, Scranton District, No. 161, April 18, 1955. -- CCH

9 Occupational Disease—Pulmonary Tuberculosis—Hospital Porter—Sufficiency of Evidence.

Claimant was properly awarded compensation for contracting pulmonary tuberculosis during the course of his employment as a hospital porter where the evidence disclosed that during his period of employment, several tuberculosis patients were confined in the hospital and that he cleaned a laboratory where tuberculosis tests were made. Claimant testified that he was required to handle and clean unsterilized tubes and to wash the floors when an occasional receptacle was broken. The court ruled that, while this testimony was disputed, a question of fact was presented, and with the added inference to be drawn from the fact that claimant concededly contracted the disease during the period of employment, there was substantial evidence to support the finding of the board. Affirmed. Holmes v. Beth El Hospital. New York Supreme Court, Appellate Division, Third Judicial Department, No. 255-15, October 6, 1955. -- CCH

10 Occupational Disease—Silicosis—Failure to Prove Injurious Exposure—Commission's Finding Conclusive.

Claimant was properly denied compensation for contracting silicosis where he failed to prove injurious exposure to silica dust. The court ruled that where there is any competent evidence to support a finding of fact by the commission, such finding is conclusive on appeal, even though there is evidence that would have supported a finding to the contrary. Affirmed. Watson v. Harris Clay Co. North Carolina Supreme Court. No. 318. October 19, 1955. -- CCH

BOOKS, PAMPHLETS AND NOTICES

11 Safety in Industry. An Introduction to the Protection of Personnel. D. I. Macfarlane. Philosophical Library, Inc., 15 East 40th St., New York 16, N. Y. 71 pp. (1955). \$6.00.

The scope of this book can be judged by the subjects included: dust and fume control, guarding rotating machinery, press guards, dermatitis, eyes, ionizing radiations, protective clothing, lighting, and flooring. The treatment of most of these subjects is brief, but the purpose of the book, as stated in the title, is an introduction to personnel protection, a subject which cannot be overemphasized. Over 70 illustrations of safety apparatus and effects of disregard of safety, supplied by British manufacturers, accompany the text. -- FFR

12 Some Monetary Aspects of Workmen's Compensation. American Medical Association, Council on Industrial Health, 535 North Dearborn St., Chicago 10, Ill. 96 pp. (1955).

The purpose of this report is to provide the medical profession with factual information in non-technical form on: (1) incurred losses for indemnity and medical benefits; (2) distribution of the

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Feb. 15-17	American Academy of Occupational Medicine, Cincinnati, O.
Feb. 27-Mar. 2	American Society for Testing Materials, Spring Meeting, Buffalo, N. Y.
Mar. 18-21	American Society of Mechanical Engineers, Spring Meeting, Portland, Ore.
Mar. 19-20	Steel Founders' Society, Annual Meeting, Chicago, Ill.
Mar. 26-27	American Society of Mechanical Engineers, Instruments and Regulators Conference, Princeton, N. J.
Apr. 5-7	Forest Products Safety Conference, Klamath Falls, Ore.
Apr. 9-10	Industrial Accident Preventions Association, Annual Conference, Toronto, Ont.
Apr. 18-19	Armour Research Foundation, Illinois Institute of Technology, National Industrial Research Conference, Chicago, Ill.
May 3-9	American Foundrymen's Society, Annual Convention and Exhibition, Atlantic City, N. J.
May 7-9	Air Conditioning and Refrigeration Institute, Annual Meeting, Hot Springs, Va.
May 8-11	American Welding Society, Spring Meeting and Fourth Welding and Allied Industry Exposition, Buffalo, N. Y.
May 14-16	President's Conference on Occupational Safety, Washington, D. C.

LEGAL DEVELOPMENTS

5. New Legislation.

The Alabama Legislature has increased maximum awards for disability and death and otherwise liberalized the law. Maximum and minimum weekly awards have been increased in Massachusetts. Wisconsin has increased employers' payments to the state treasury in cases of loss or total impairment of a hand, arm, foot, leg, or eye.

6. Occupational Disease—Pneumoconiosis—Tin Mill Employee.

An employee who contracted occupational pneumoconiosis while operating an overhead crane in a tin mill was properly awarded compensation since there was sufficient evidence to show that the hazards from the dust in the tin mill building were beyond the usual and ordinary hazards of the usual and ordinary employment and that the employee was suffering from the disease. While operating the crane, the employee traveled up and down the length of the building every day and on his trips came close to an annealing process. Some sand dust is created and hoisted into the atmosphere during the annealing process. He also came in contact with and breathed dust which was caused by the scaling off from the cooling of iron from red hot metal to cool metal, as well as, dry sulphuric acid dust. This evidence plus the testimony of a medical expert to the effect that the employee was unquestionably performing a job to which there was attached a hazard of pneumoconiosis above and beyond the ordinary hazards in an ordinary job were sufficient to support the award in favor of the employee. Affirmed. United States Steel Corp. v. Danner. Alabama Supreme Court. September 15, 1955.

-- CCH

7. Occupational Disease—Dupuytren's Contracture—Same Employment at Time of Disablement.

A railroad motorman was properly awarded compensation for Dupuytren's contracture of the hands where the court ruled that the claimant came within the provision of the statute which allowed recovery even though more than one year had expired from the date of contraction to the date of disability where the claimant was in the same employment. The employer contended that the claimant was not covered by this provision in that he had been transferred from the job of motorman to the position of railroad clerk. The court rejected this contention, ruling that language of the statute was designed to emphasize that only continuity of employment with the same employer from the time of contracting the disease until disablement therefrom was sufficient to lift the 12 months' time limit provided by the statute. Affirmed. Kornecki v. City of New York. New York Supreme Court, Appellate Division, Third Judicial Department. No. 71-11. April 1, 1955.

-- CCH

INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

1 Hygienic Guide Series.

Additional Hygienic Guides which appeared in the December, 1955, number of the American Industrial Hygiene Association Quarterly include: aniline, benzene (benzol), hydrogen sulfide, and formaldehyde. (See news item 1170, Oct. 1955 Digest for description and earlier list). They may be obtained from the American Industrial Hygiene Association, 14125 Prevost, Detroit 27, Mich., at 25 cents each.

2 Medical Research Center at Brookhaven National Laboratory.

A Medical Research Center, including a nuclear reactor designed specifically for medical research and treatment, will be constructed at Brookhaven National Laboratory. Brookhaven, one of the AEC's major research laboratories, is operated by Associated Universities, Inc. Scheduled for completion in two years, at a cost of \$6,000,000 exclusive of design and engineering, the new facility will house a nuclear reactor, a research hospital, an industrial medicine branch, and research divisions in medical physics, pathology, microbiology, biochemistry, physiology, and clinical chemistry. The new Center will replace some 20 temporary buildings now constituting the medical facility, and will give room for needed expansion of the work.

3 Translations by Beltone Institute.

In the section on "Physical Aspects of the Environment" is an abstract of a translation of a paper on "Occupational Deafness from White Noise", by Bernabei. This is the first of a series of translations that will be made by the Beltone Institute for Hearing Research, 2900 West 36th St., Chicago, Ill. The Institute, sponsored by funds provided by the Beltone Hearing Aid Company, was founded in 1954 to finance and distribute research and original studies on hearing problems. The translations are available without charge to medical libraries, research foundations, hearing clinics, and to hearing specialists, on application to the above address.

COMING EVENTS

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- | | |
|-----------------|---|
| 4 Feb. 2-May 24 | Course on Introduction to Radiological Safety, Institute of Industrial Medicine, New York, N. Y. |
| Feb. 3-4 | Institute on the Back, a Law-Medicine Program, Western Reserve University, Cleveland, O. |
| Feb. 6-9 | Fifth Annual Ventilation Conference, Michigan Department of Health and School of Engineering, Michigan State University, Lansing, Mich. |
| Feb. 11-14 | Annual Congress on Medical Education and Licensure, Chicago, Ill. |

- 27 Cross-Sensitivity between Nickel and Copper, with Remarks on Cross-Sensitivity between Nickel, Cobalt, and Chromates. S. Epstein. *J. Invest. Dermatol.* 25, 269-274 (Oct. 1955).

Cross-sensitivity between nickel and copper is reported in a significant number of cases. Reasons are given why this simultaneous sensitivity is considered an expression of true cross-sensitivity rather than a coincidental occurrence. The studies also confirm previous reports of cross-sensitivity between nickel and cobalt. No cross-sensitivity was found between nickel and chromates.

-- Author's summary

- 28 Chromate Dermatitis within the Group of Eczematous Dermatitis Due to Sensitization to Metals. G. Hilt. *Dermatologica* 109, 143-174 (1954).

Patch tests with 0.5% aqueous solution of potassium dichromate showed Javel water dermatitis (occurring in laundresses in France) and cement dermatitis of masons to be due to chromates, whereas a similar conclusion cannot be made about leather dermatitis. Negative patch tests should be repeated, possibly near the site of lesions. As to the pathogenesis of chromate dermatitis, alkalinity seems to play an important part; as to therapy, BAL ointment showed good results. Specific desensitization would be the ideal treatment; another very promising way of prevention is based on reduction in loco of hexavalent to trivalent chromium by ointments the base of which contains acid and reducing constituents. The formula of such a prophylactic cream was worked out by long experimenting. Clinical similarities between chromate dermatitis and dermatitis due to sensitization to nickel, iron, cobalt, and copper, as well as observations of cross sensitizations, seem to be indicative of hypersensitivity to a chemical group.

-- Biol. Absts.

- 29 Skin-Protective Ointments. Comparative Study Including the New Silicone Preparations. J. M. Shaw and F. W. Crowe. *Arch. Dermatol.* 71, 379-383 (Mar. 1955).

Tests are reported on protective creams, particularly on silicone preparations. In one series of tests the time required to wash off the ointment was determined. The effectiveness against soluble cutting-oil washings was also determined. In both tests a preparation containing 30% silicones in petrolatum gave the greatest protection.

- 30 A Failure of Steroid Therapy in Contact Dermatitis. G. E. Morris. *Ind. Med. & Surg.* 24, 538-540 (Dec. 1955).

A situation is presented in which a patient was given ACTH and cortisone therapy for a rash on his leg from oil. In the course of over four years' treatment, he was seen by 22 physicians and had 14 hospital admissions. The therapy resulted in the death of the patient, and in a huge cost to the insurance carrier. This situation should serve as a warning to those who urge the use of the steroid hormones in cases of simple contact dermatitis.

-- Cond. from author's summary

- 31 Carcinogenicity of Cutting Oils—Factors Influencing Tumor Response. J. P. W. Gilman and S. Vesselinovich. *Proc. Can. Cancer Research Conf., Honey Harbour, Ontario 1954.* 1, 114-118 (1955).

Soluble cutting oil was tested on C₃H and C₅₇ Black mice. The fractions boiling at 650°F and 650-800°F were highly tumorigenic to C₃H mice but not to the C₅₇ Black mice. Clinically, an abnormally high percentage of workers exposed to cutting oil for periods of years developed cancer on the forearm and hand.

-- Chem. Absts.

- 32 Five Hundred Cases of Erysipeloid. E. Nelson. *Rocky Mt. Med. J.* 52, 40 (Jan. 1955).

Of over 500 cases of erysipeloid treated by the author in 30 years, 260 were among packing house workers, 144 in rendering plants, 84 in establishments handling hides, and a few in butcher shops, restaurants, and fish stores. Nearly all occurred on the hand. Erysipeloid, which is caused by *Erysipelothrix rhusiopathiae*, should not be confused with erysipelas of streptococcal origin. The organism has a wide distribution among animals. A complete history reveals a small cut or abrasion which becomes infected. Symptoms are fully described. The diagnosis of erysipeloid should not be missed if the physician is aware of the condition, and considers the apparent injury, the site

of the inoculation, and the slowly progressive lesion, with its characteristic spread and benign course. The absence of pus, the color, a normal leucocyte count, the location, and the slow progression will differentiate it from a true erysipelas, which usually occurs on the face and scalp and is more acute. Recommended treatment consists of parenteral administration of penicillin and especially bicillin, local use of polymyxin and neosporin, splinting of the hand, and wet dressings or 10% ichthyol. Surgical treatment is not necessary and should be avoided.

-- Cond. from Arch. Ind. Health

33 Survival of Dermatophytes Applied on the Feet. R. L. Baer, S. A. Rosenthal, and Domenica Furnari. *J. Invest. Dermatol.* 24, 619-622 (June 1955).

Experiments in which fungi were applied on the feet of persons with and without fungous infections are described. The results indicate that the foot skin of most persons has a remarkable capacity to kill or inhibit pathogenic fungi, similar to the self-sterilizing properties of the skin against pathogenic bacteria.

-- Cond. from authors' summary

34 Pseudo-Occupational Marks. F. Ronchese. *Ind. Med. & Surg.* 24, 546-554 (Dec. 1955).

A number of occupational marks are described and illustrated, side by side with similar marks of non-occupational origin. Certain marks look alike, even though they result from different occupations, so that particular marks cannot be attributed to definite occupations. The same uncertainty applies to detection of criminals.

CHEMICAL HAZARDS

35 Cardiovascular Actions of Decaborane. R. P. Walton, J. A. Richardson, and O. J. Brodie. *J. Pharmacol. Exptl. Therap.* 114, 367-378 (July 1955).

Decaborane in amounts producing terminal stages in dogs was administered by inhalation, by injection peritoneally and subcutaneously, and by injection into the femoral and pulmonary veins, the aorta, and the femoral artery. The general effect involved a progressive decrease in heart force. This was attributed in part to clumping of blood masses with obstruction of the smaller vessels. Another effect was a conspicuous epinephrin-like response following some of the intravascular injections. Detailed effects on the electrocardiogram are described.

-- Cond. from authors' summary

36 Boron Analysis: Progress Report for 1953-1954 and Summary of 1952-1954 Studies on Chemistry of Boron Hydrides and Toxicology of Boranes. W. H. Hill and J. L. Svrbely. Atomic Energy Comm. MLCR-42, 120 pp. (Sept. 1954).

Data are presented from studies of the toxicology, mechanisms of action, and methods of analysis for boron and boron compounds in animal tissues. Data are included from chronic toxicology studies employing rabbits, dogs, monkeys, mice, rats, and accidental human exposures. Methods are presented for the preparation of tissue samples for chemical analysis, and chemical, colorimetric, spectrographic, and ultraviolet methods are presented for the determination of boron, boric acid, and boron hydrides in animal tissues and urine. Attempts were unsuccessful to find a therapeutic agent for boron hydride poisoning. Silica gel and activated charcoal were found to be the most effective materials tested for the absorption of boron hydrides when used as gas-mask fillers.

-- Nuclear Sci. Absts.

37 Changes in Vestibular Chronaxies During Experimental Chronic Carbon Monoxide Poisoning in Rabbits. G. Bourguignon, R. Truhaut, and M. Dakak. *Compt. rend. Soc. biol.* 148, 147-152 (1954).

Rabbits were exposed for eight hours per day and six days per week for long periods to an atmosphere containing 100 ppm of CO. (This was maintained by use of a continuously recording

infrared absorption meter.) At first the vestibular chronaxy is increased, particularly on the right side, and later it is decreased. This decrease occurs despite a rising blood CO level, suggesting adaptation. The exposure of rabbits to low concentrations of CO produce the same disorders in equilibrium and variations in vestibular chronaxies that occur in workers so exposed. Discussion of the existence of the syndrome of chronic CO poisoning is included. -- Arch. Ind. Health

- 38 Electrocardiographic Changes During Carbon Monoxide Intoxication. M. E. Guchan. Bull. fac. med. Istanbul 18, 317-327 (1955). French.

Changes in the electrocardiogram have been studied in 15 cases of carbon monoxide poisoning. In nine cases a deformation of the T waves (flattening or inversion) has been observed with other changes of the ST segment. Rhythmic troubles have been seldom observed (in two cases extrasystoles, in one case auricular fibrillation). In one case of grave intoxication progressive failure of the excitation centers was observed and death occurred by ventricular fibrillation.

-- Chem. Absts.

- 39 Stomatology of Workers Exposed to or Affected by Occupational Poisoning. 6. Chlorine, Fluorine, Iodine. F. DeMicheliis. Med. y seguridad trabajo 3, No. 11, 89-96 (1955). Spanish.

Effects among workers in various metals are cited to show that iodine compounds cause least damage of any of these three halogens.

-- Chem. Absts.

- 40 Inhalation Toxicology of Chlorine Trifluoride. 1. Acute and Subacute Toxicity. H. J. Horn and R. J. Weir. Arch. Ind. Health 12, 515-521 (Nov. 1955).

The literature contains no detailed account of the toxicology of chlorine trifluoride; however, the literature on the chemical and physical properties is reviewed. From the fact that chlorine trifluoride is an extremely corrosive agent, some insight into its toxicological properties can be obtained. Groups of 20 rats were exposed to the vapor of chlorine trifluoride at concentrations of 480 and 96 ppm, where E.T.₅₀'s were found to be 40 minutes and 3.7 hours, respectively. Groups of 20 rats and two dogs were exposed to concentrations of 21 and 5.15 ppm. Deep gasping respiration, rhinorrhea, salivation, and lacrimation were observed during the exposures. The concentration influenced the speed of onset of these signs. In addition, there was a "singled feel" to the fur, and marked eye irritation and corneal damage occurred. In the acute studies post-mortem examination revealed emphysema, pulmonary edema, vascular congestion, bronchial constriction, and coagulation and fusion of the lining cells of the bronchi into a hyaline membrane. In the liver hydropic degeneration and marked vascular congestion were seen; these changes were probably due to anoxemia resulting from the marked pulmonary pathology. In the subacute study no liver damage was observed but in the lung bronchopneumonia, bronchiectasis, purulent bronchiolitis, and abscesses were seen in those animals which died, while lower degrees of pathology were seen in all the survivors.

-- Authors' summary

- 41 Chlorine Trifluoride. J. J. Horn. Atomic Energy Comm. MLCR-37. 40 pp. (Aug. 1954).

The method of generating the vapor, the analytical method for determination of concentration, the signs of toxicity, hematology, urine analysis, biochemistry, mortality, and gross and microscopic pathology resulting from chronic inhalation of the vapors of chlorine trifluoride are described.

-- Author's summary (Nuclear Sci. Absts.)

- 42 The Formation of Phosgene by the Action of Hot Surfaces and Its Absence when Tobacco is Smoked in Atmospheres Containing Chlorinated Hydrocarbon Vapors. J. Little. Brit. J. Ind. Med. 12, 304-308 (Oct. 1955).

Comparative tests made by passing atmospheres containing certain chlorine-containing solvent vapors through a heated silica tube show that phosgene is formed when the surface temperature is greater than 400°C. A test for phosgene has been developed which can be applied to measure a concentration of 0.05 ppm by volume. An experimental technique has been devised to apply this test to determine the phosgene in the exit gas from the cigarette which is inhaled and in the atmosphere surrounding the glowing tip, when cigarettes are smoked in these solvent-contaminated atmospheres. In no case was phosgene detected and even when phosgene was added to the atmosphere it was destroyed by passage through the cigarette being smoked.

-- Author's summary

03120128

- 43 Experimental Poisoning by Neutral Potassium Chromate; Visceral, Cutaneous, General, and Osteo-Articular Reactions. M. Mosinger, H. Fiorentini, Jacqueline Quicke, and R. Occelli. *Compt. rend. soc. biol.* 148, 2045-2047 (1954). French.

Rabbits were subjected to acute and chronic poisoning with potassium chromate administered by various routes. Damage was produced in nearly every tissue of the body. The various lesions are briefly described. -- Chem. Absts.

- 44 Metabolism of Lanthanum and Yttrium Chelates. H. E. Hart and others. *J. Lab. Clin. Med.* 46, 182-192 (Aug. 1955).

The metabolism of lanthanum and yttrium administered intravenously in ionized form or as chelates of EDTA and nitrilotriacetic acid (NTA) to human subjects and experimental animals was studied. Lanthanum 140 and yttrium 90 were used as tracers. It was found that the plasma content, urinary excretion, and tissue uptake of these metals depended upon the compound administered. -- Authors' summary

- 45 Treatment of Chronic Lead Poisoning with Calcium Disodium Versenate. A. C. Markus and A. G. Spencer. *Brit. Med. J.* 2, 883-885 (Oct. 8, 1955).

The use of calcium disodium versenate in the treatment of three patients with chronic lead poisoning is described. The treatment rapidly relieved the symptoms of lead poisoning and promoted the excretion of large amounts of lead in the urine. No toxic effects were observed. The administration of para-aminomure during treatment with versenate did not increase the rate of excretion of lead in the urine above that obtained by the versenate alone. The chemistry pharmacology and method of use of versenate are discussed. -- Authors' summary

- 46 Recent Developments in the Care of Workers Exposed to Lead. The Effect of the Calcium Chelate of Disodium Ethylenediamine-Tetraacetic Acid on Lead in the Blood and Urine of Battery Workers. I. A. Manville and R. Moser. *Arch. Ind. Health* 12, 528-538 (Nov. 1955).

Edathamil calcium-disodium in tablet form was given to 12 battery workers for two to three weeks. Physical examination and blood and urine chemistry studies were done at the start of the experiment and at the end of each week. Subjective symptoms of constipation, anorexia, and early fatigability cleared rapidly and in most cases were relieved completely. The amount of lead in the blood showed a steady decline, but in only two instances did it reach normal levels. Body weight and red cell count were unaffected. Hemoglobin showed a slight but definite increase. Porphyrinuria cleared entirely in three weeks, while stippling of red cells diminished. Total lead in urine progressively increased. Quantitative values for each of these changes are given. No signs of deleterious effects were observed. Three weeks is insufficient time for edathamil calcium-disodium, as administered, to eliminate enough lead so that, with a continual absorption of lead, a dynamic equilibrium, with blood and urine levels below toxic limits, can be established. Until further work proves this to be unnecessary, it is recommended that edathamil calcium-disodium be given intermittently by mouth, along with a potent vitamin and mineral formula, administered during intervals in treatment. -- Cond. from authors' summary

- 47 Histology of the Lead Line vs. Mercury and Bismuth Line. Considerations on the Application of Histochemical Methods for Lead. G. Farris and U. Sicca. *Med. lavoro* 46, 104-113 (Feb. 1955). Italian.

Biopsies were made of the interdental papilla of persons affected with lead poisoning and presenting the typical lead line, and others with bismuth and mercury lines after therapeutic treatment with those metals. Histological conditions are reported in detail. It was shown that none of the histochemical methods tested can be applied alone to define the exact nature of gingivitis caused by accumulation of metal. -- Cond. from English summary (*Bull. Hyg.*)

- 48 Some Data from a Complete Study of Lead Intoxication. B. A. Atchabarov and others. *Vestnik Akad. Nauk Kazakh. S.S.R.* 11, No. 6, 89-94 (1955). Russian.

A survey of the current information on lead poisoning is followed by a brief account of new work. In lead poisoning arterial hypotension and venous hypertension are observed. Generally,

lead poisoning leads to slowing of hippuric acid synthesis and increase of bilirubin, as well as a positive test for urobilin in the blood. Usually, the nervous system shows disturbances before the circulatory system. Treatment with folic acid and Pentoxyl (used in some forms of anemia) gave favorable preliminary results. -- Chem. Absts.

- 49 Poisoning with Lead Tetraacetate. K. Muller. Zentr. Arbeitsmed. u. Arbeitsschutz 3, 8-9 (1953). German.

Lead tetraacetate is easily resorbed by the skin and respiratory tract. As a lipophile compound lead tetraacetate is stored in the liver and brain causing a disorder of the central nervous system which reaches a climax six weeks after exposure. Later lead is excreted through the kidney and intestines. -- Chem. Absts.

- 50 Studies in Vanadium Toxicology. 3. Fingernail Cystine as an Early Indicator of Metabolic Changes in Vanadium Workers. J. T. Mountain, F. R. Stockell, Jr., and H. E. Stokinger. Arch. Ind. Health 12, 494-502 (Nov. 1955).

A highly sensitive test of vanadium action in man depends upon the quantitative measurement of the sulfur-containing amino acid, cystine, in the fingernails of vanadium-exposed persons. Values of cystine depressed 1% below normal are considered to indicate altered amino acid metabolism brought about by vanadium in the absence of other conditions known to effect a similar change. These other conditions include arthritis of long standing, certain types of cancer, and cirrhosis of the liver. Industrial workers with sufficient, but very minimal exposure, show the condition irrespective of the vanadium compound to which they have been exposed. The procedure is not recommended at present for the selection of workers with dangerous exposures to vanadium, but the authors believe that it serves as a screening test of disturbed metabolism, which should be checked periodically; and if no other cause is found, overexposure to vanadium should be suspected.

-- Cond. from authors' summary

- 51 Health Hazards of Vanadium-Containing Residual Oil Ash. L. C. McTurk, C. H. W. Hirs, and R. E. Eckardt. Med. Bull. (Standard Oil N. J.) 15, 106-126 (July 1955).

Ash containing from nearly 0 to about 80% vanadium oxide accumulates in large oil-burning installations and must be removed periodically, giving rise to a health hazard. It is generally agreed that the acute effects of inhalation exposure occur, characterized by marked irritation of the respiratory tract, sometimes attended by pneumonia. Other symptoms, such as gastrointestinal and central nervous system involvement, and chronic effects involving pathological changes in the lungs, liver damage, and anemia, are controversial. Pathological changes of a mild chronic inflammatory type may occur in the upper respiratory tract. Skin lesions, possibly allergic, may be present. The prognosis of the disease is generally favorable. Diagnosis is difficult in view of the similarity of the symptoms to acute infections of the respiratory tract. Determination of urinary vanadium is probably the best test for recent exposure. A promising, but not yet proven test is an abnormally low cystine content in the fingernails. The treatment is simple and generally symptomatic. There is some evidence that BAL, calcium disodium EDTA, and ascorbic acid may be useful in therapy, but it is not conclusive and the evidence does not justify their routine use. Precautions should be taken to avoid excessive inhalation. When atmospheric concentrations cannot be maintained below 1 mg. per cu. m. of vanadium as V_2O_5 , suitable air-supplied masks or respirators with approved fume and dust type filters should be provided. Periodic examination of exposed workers should include general physical examination, chest x-ray, hemoglobin, red blood cell count, examination of peripheral blood smear for eosinophils, sedimentation rate, and thymol turbidity test.

-- Cond. from authors' summary

- 52 Toxicity of Naphthenic Acids and Their Metal Salts. W. T. Rockhold. Arch. Ind. Health 12, 477-482 (Nov. 1955).

Screening acute oral toxicity studies in rats have demonstrated that the naphthenic acids are slightly toxic. The acid derived from crude kerosene acids was found to be approximately 1 1/2 times more toxic to rats than the acid derived from crude mixed acids, whether administered orally or intraperitoneally. The oral toxicity of the metal salts of naphthenic acids varies according to the concentration and identity of the metal component. Only the phenyl mercury salt showed toxicity remarkably increased above that of the commercial acids. By the intraperitoneal route, the toxicity

to rats was increased tenfold. No toxic symptoms occurred in rats fed 1% (as lead) lead naphthenate in 20 daily doses over a 30-day period. A threefold to fivefold increase was found in deposition of lead in the pair of experimental animals. Cystine determinations of the hair indicated no detectable alteration of cystine metabolism during the study. No lead storage was noted in liver tissue, and no histopathologic changes were seen in the vital organs. -- Cond. from author's summary

53 Toxicity of Diethylamine. O. G. Vasil'eva. *Gigiena i Sanit.* No. 4, 28-31 (1955). Russian.

Tests with white mice by 2-hour vapor exposure showed that the toxic concentration of diethylamine vapor is 0.3 mg. per l. as the threshold value, while the lethal level is but 3 mg. per l. Permissible atmospheric concentration is suggested at 0.01 to 0.05 mg. per l. It causes hyperemia when contacted with skin and a severe attack on conjunctive tissue and cornea of the eye.

-- Chem. Absts.

54 Hygienic Profile of the Polymerization and Weaving of ϵ -Caprolactam. J. Roubel, V. Sedevic, and V. Vasak. *Cekoslov. Hyg. Epidemiol. Mikrobiol. Imunol.* 4, 66-76 (1955). Bohemian.

From experiments on animals it follows that epsilon-caprolactam is a potential poison only to a very small degree. Concentrations found in the atmosphere of a polymerization and weaving department, under favorable conditions, averaged 20-40 mg. per cu. m. Even under the most unfavorable working conditions, there appears to be no toxic hazard, and the workshop atmosphere under investigation can only be described as annoying. However, medical inspections should be carried out on persons particularly exposed.

-- Cond. from English summary (Bull. Hyg.)

55 Kidney Function in Chronic Occupational Carbon Disulfide Poisoning. L. Rossi. *Folia Med.* 38, 557-578 (1955). Italian.

Examination of kidney function in six workers with chronic carbon disulfide poisoning showed a reduction in plasma flow with little or no impairment of glomerular functionality. Only in some cases a protein excretion in indeterminable quantities was observed. A renal ischemia in chronic carbon disulfide poisoning exists which is attributable to a vascular action of the damaging substance.

-- Chem. Absts.

56 Toxicologic Studies on Trimethyl- and Triethyltrithiophosphites. W. T. Rockhold, H. A. Wright, G. Wright, and H. E. Stokinger. *Arch. Ind. Health* 12, 483-493 (Nov. 1955).

A high degree of toxicity and lethality has been demonstrated for two trialkyltrithiophosphites, methyl and ethyl, when administered to laboratory animals in single acute doses. The calculated LD₅₀'s for rats of the methyl derivative, intraperitoneally, orally, topically, and intravenously, were 44, 105, 1030, and 24-40 mg. per kg. respectively. The toxicity of the ethyl derivative was lower by each route. Death followed administration of 0.1 ml. of the methyl derivative to the rabbit's eye, and extreme but not permanent damage to the eye in rabbits that survived. An early circulatory collapse, with resultant respiratory failure due to acute pulmonary congestion and anemia, was the cause of death in all animals following single acute doses. No inhalation toxicity of the drop-free vapor of the trimethyl compound was shown in a 30-day period. A tentative threshold value of 2.5 mg. per cu. m. for trimethyltrithiophosphite vapor is recommended until more extensive studies are made. Presumably, this level would provide safe air concentrations for the ethyl derivative. No satisfactory antidotal treatment has been found. Safety precautions are recommended.

-- Cond. from authors' summary

57 Sterility in Laborers Caused by Benzene and Other Solvents. J. L. Gutierrez de Alles. *Med. y Seguridad trabajo* 3, No. 9, 4-9 (1954). Spanish.

Pathological changes of the ovaries, testes, thyroid, and pituitary were attributed to benzene and to some extent to ether, alcohol, ethyl acetate, and amyl acetate in a study of 700 industrial workers. Changes in women leading to sterility were emphasized.

-- Chem. Absts.

03120131

- 58 Study on the Absorption of Benzene through the Skin. G. L. Conca and A. Maltagliati. *Med. lavoro* 46, 194-198 (Mar. 1955). Italian.

Hands and forearms of three healthy men were immersed in commercial benzene for 25 to 35 minutes. Urine sulfates were then determined and tests were made for benzene in the expired air. Both tests gave negative results. The possibility of passage of benzene through the skin under the experimental conditions is therefore rejected.

-- Cond. from authors' summary (Public Health Eng. Absts.)

- 59 Toxic Action of Styrene and a-Methylstyrene M. L. Rylova. *Gigiena i Sanit.* No. 5, 21-26 (1955). Russian.

While 3 mg. per l. of styrene and methylstyrene in the atmosphere do not affect the weight of adult rats or growth of young rats, repeated exposure three hours daily at 1 mg. per l. causes some loss of coordination; toxic effects are shown more readily if the animals are under physical stress. The minimum concentration of styrene which acts on the rabbit nervous system is 0.25 to 2 mg. per l.; methylstyrene shows this effect at 0.06 to 1 mg. per l. Injection into rabbit ear of these substances causes inflammation and skin loss.

-- Chem. Absts.

- 60 Dangers to Health in the Production of Phthalic Anhydride. H. Menschick. *Arch. Gewerbepathol. Gewerbehyg.* 13, 454-475 (1955). German.

The manufacture of phthalic anhydride is described in detail, and its properties are listed. A fire risk is involved as well as toxic hazards. Briefly, the toxic effects include: irritation of eyes and respiratory system; blood changes, including slight anemia, diminution of thrombocytes, leucocytosis, eosinophilia, increase in reticulocytes, and reduction of calcium and phosphorus values in the serum; lowering of resistance of capillary walls; excitation of the nervous system; and several forms of skin irritation. Phthalic anhydride is certainly an antigen, causing true asthma and urticaria. Contact with vanadium pentoxide which is used as a catalyst, has induced increased sensitivity. Unspecific toxic effects are also noted. The principal hazard is from phthalic anhydride itself, but others include exposure to carbon monoxide, benzol, a cyanogen compound, mercury, maleic acid, and naphthoquinone.

-- Cond. from Bull. Hyg.

- 61 Illnesses Caused by Phthalic Acid and Its Compounds. E. W. Baader. *Arch. Gewerbepathol. Gewerbehyg.* 13, 419-453 (1955). German.

The occurrence of many cases of illness in a phthalic acid factory directed the attention of the author to the subject. (Phthalic anhydride was one of the principal products manufactured, and the effects described are apparently large due to exposure to the crystalline anhydride.) The clinical findings described are eye irritation and respiratory system effects, which are largely the same as in Menschick's paper (preceding abstract). Complaints were also received from people in the neighborhood who were exposed to fumes and the crystalline dust. Review of the literature on injury from phthalic anhydride and the author's experience lead to the conclusion that the MAC must be below 25 mg. per cu. m. Preventive measures suggested include protective clothing, gloves, gas masks, and goggles; however, such protection is imperfect, because dust penetrating the edges causes irritation. The best protection is secured by dust and fume extraction, with regular air analyses. Selection of employees, medical supervision, and ample washing facilities are also important. Further research should be conducted.

-- Cond. from Bull. Hyg.

- 62 Contributions on Poisoning by Nitro- and Amino-Compounds of the Aromatic Series. E. Holstein. *Arch. Gewerbepathol. Gewerbehyg.* 13, 522-527 (1955). German.

Two cases are presented in full and discussed: one of aniline poisoning which proved fatal following atrophy and cirrhosis of the liver; and one of dinitrobenzene poisoning, with changes in the blood including severe anemia and the appearance of numerous Heinz bodies.

-- Cond. from Bull. Hyg.

03120132

IN THE ABRAHAMSON NOVEMBER 1956

HA88-0016429

- 63 Protective Power of Methionine against the Toxic Effects of Pyridine. R. Fabre, R. Truhaut, and M. Herbert. *Bull. acad. nat. med. (Paris)* 138, 212 (1954). French.

Rats were exposed in respiratory cages for 40 minutes per day to an atmosphere containing from 12 to 15 mg. per liter of pyridine. It was shown that methionine added to the diet exerted a protective effect. It is suggested that this action is due to interference with the methylation of pyridine.

-- Arch. Ind. Health

- 64 Safety—Problem Child of the (Insecticide) Industry. C. O. Barnard. *Agr. Chemicals* 10, 38, 39 (Dec. 1955).

Three safety problems of concern to the insecticide manufacturer and to regulatory officials are discussed: (1) disposal of empty metal containers by the user; (2) sale of pesticides in "broken" packages; and (3) careless use, in spite of adequate warning labels. The problem of persuading or compelling users to observe safety is difficult, and steps toward securing compliance are suggested.

- 65 Will Recommended Insecticidal Practice Result in Toxic Residues in the Soil? E. L. Spencer and E. G. Kelsheimer. *Proc. Florida State Hort. Soc.* 67, 121-122 (1954).

Neither crop yield nor quantity of vegetable production shows significant differences due to treatment with foliar applications of DDT as dust and spray, parathion spray, and soil applications of chlordan, dieldrin, heptachlor, and demeton. Microbiological soils data give no evidence of toxic accumulations.

-- Chem. Absts.

- 66 Toxicity of Endrin for Laboratory Animals. J. F. Treon, F. P. Cleveland, and J. Cappel. *J. Agr. Food Chem.* 3, 842-848 (Oct. 1955).

In single doses to rats, endrin (a dimethanonaphthate similar to aldrin) is about three times as toxic as aldrin and 15 times as toxic as DDT. Prolonged feeding experiments on rats and dogs, relative toxicities of the same order of magnitude were demonstrated. Detailed figures on toxicities are given.

-- Cond. from authors' summary

- 67 A Review of Toxicologic Considerations Pertinent to the Safe Use of 2,2-Bis(p-chlorophenyl)-1,1-dichloroethane (TDE, DDD, Rhothane). H. B. Haag and C. Kampmeier. *Agr. Chemicals* 10, 85, 123-126 (Sept. 1955).

This chemical is used extensively as an agricultural insecticide but less widely than DDT. TDE on an over-all basis is less toxic than DDT. It should offer no significant hazard to the agricultural worker if used in accordance with good agricultural practice. A legal tolerance of 7 ppm for TDE on certain food products has been established. In view of the fact that the probable human intake of TDE would be below 1 ppm of the diet, it is highly unlikely that it will constitute any hazard to the consumer.

-- Authors' summary

- 68 Toxicology of Chlorobenzilate. H. J. Horn, R. B. Bruce, and O. E. Paynter. *J. Agr. Food Chem.* 3, 752-756 (Sept. 1955).

The toxicology of chlorobenzilate, a chlorinated hydrocarbon with acaricide properties, has been investigated in laboratory animals to evaluate hazards of use. The maximum tolerated daily level for rats is approximately 500 ppm. Dogs tolerated daily doses of 64.1 mg. per kg. for 35 weeks without signs of toxicity or gross or microscopic pathology. Metabolism studies indicated that chlorobenzilate is rapidly excreted in the urine and that there is no significant storage in tissues. This study indicates that chlorobenzilate offers little or no hazard from repeated usage.-- Editor's summary

- 69 Mammalian Investigations on p-Chlorophenyl Phenyl Sulfone (Sulphenone). L. W. Hazleton, W. Kundzins, and R. B. Bruce. *J. Agr. Food Chem.* 3, 836-841 (Oct. 1955).

The effect of p-chlorophenyl phenyl sulfone (Suiphenone) upon several species of animals was studied in order to establish a basis for evaluating the safety of its residues in agricultural crops. Oral LD₅₀'s in mice and rats varied between 1400 and 3650 mg. per kg. The feeding of

dietary levels of 1000 ppm to rats over two years resulted in lowering of body weight. Daily oral doses of 100 g. per kg. over prolonged periods to dogs caused nonspecific toxicity. These effects were not produced at lower levels. Repeated skin tests were negative. Eye tests in rabbits resulted in transient irritation. Storage in tissues was insignificant. The results of these studies indicate a wide safety margin for Sulphenone.

-- Cond. from editor's summary

- 70 Toxicity of Trinitrobenzene-Aniline Complex, a Rodent Repellent. R. W. Fogleman, J. R. Elsea, O. E. Paynter, and W. Kundzins. *J. Agr. Food Chem.* 3, 936-939 (Nov. 1955).

These data are not intended to comprise a complete toxicological study of TNBAC (trinitrobenzene-aniline complex). They are sufficient, however, to evaluate the safety of this compound for nonfood use. Acute and subacute toxicity studies in rats and dogs place TNBAC in the moderately toxic class of compounds. The primary signs of intoxication noted in the experimental animals following ingestion or dermal application of the compound were methemoglobin formation, alteration in erythrocyte morphology, and anemia. Only dermal absorption appears to be of significance in the evaluation of safety for use of TNBAC, but the repellent formulations are not at present recommended for use on or around feed or foodstuffs. Serious considerations should be given to dermal absorption. Contaminated clothing should be removed immediately and the underlying skin should be washed thoroughly with soap and water.

-- Cond. from authors' discussion

- 71 Toxicity of o,o-Diethyl o-(2-isopropyl-6-methyl-4-pyrimidyl) Phosphorothioate (Diazinon). R. B. Bruce, J. W. Howard, and J. R. Elsea. *J. Agr. Food Chem.* 3, 1017-1021 (Dec. 1955).

Diazinon is a new insecticide that has shown considerable promise for the control of houseflies and certain other insect pests. The effects of Diazinon in the animal body appear to be typical of organic phosphates and thiophosphates. The administration of large doses produces the usual symptoms associated with cholinesterase inhibition. Plasma cholinesterase was reduced to an average of 15% of normal values for a period of 43 weeks with no appearance of gross abnormalities in the group of dogs tested. The corresponding red cell activity averaged 25% of normal. No gross signs of toxicity appeared in these dogs until the cholinesterase activity was reduced to less than 10% of normal. Withdrawal of the material from the diet resulted in the rapid disappearance of signs of toxicity and a return to normal cholinesterase activity. Acute oral LD₅₀'s are given for rats and mice, differing according to species and state of the compound. Diazinon is absorbed through the skin. If the usual precautionary measures observed in the use of organic phosphate insecticides are followed, there should be no hazard from the use of Diazinon.

-- Cond. from authors' conclusions

- 72 Subacute Parathion Poisoning. Importance of Absorption through the Skin in Occupational Exposure and Its Prevention. C. Sassi, N. Zurlo, E. Bartalini, and L. Mettrico. *Med. lavoro* 46, 251-269 (Apr. 1955). Italian.

An episode of collective occupational poisoning was observed in May, 1953, in a plant for the production of parathion. Atmospheric concentrations of parathion had never exceeded 0.7 mg. per cu. m., except in that month when they increased to 1.4 to 2 mg. per cu. m. (ed. note - the American MAC is 0.1 mg. per cu. m.). One worker experienced severe intoxication and several others a milder form. The mean reduction of serum cholinesterase was 21%, with a maximum reduction of 55%. The reduction in an 8-hour shift averaged 11%. The mechanism of subacute poisoning was evidenced by daily follow-up of the clinical conditions and cholinesterase levels. When the reduction of cholinesterase levels caused by exposure is higher than 6% during a day, a progressive reduction occurs, leading to the appearance of clinical findings of poisoning; which occurs when the reduction becomes 30%. The clinical picture of accumulative poisoning is similar to that of acute poisoning with a longer course and less characteristic findings, at least at the initial stages. The control of the health conditions of workers necessitates frequent determinations of serum cholinesterase capacity in relation to the working shifts, and also in relationship to the possibility of skin absorption. Experiments showed that gloves and shoes made of common rubber, antiacid and antisolvent rubber, polyvinyl chloride, and polyethylene chloride easily absorb parathion and release it to the sweat. Sufficient quantities of parathion, even in very dilute solutions may be absorbed by the skin and cause poisoning. Antiaid rubber clothing was found to be the most resistant to parathion. Even such clothing, however, should not be worn for more than two days and then should be regenerated by abundant rinses in running water and in alkaline solutions.

03120134

IN THE ALBERTA ARCHIVES
November 1999

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- 73 Antagonists for Parathion Poisoning. K. Ogiu and H. Takagi. Japan. J. Pharm. & Chem. 27, 324-333 (1955).

Animal experiments showed that the concurrent use of scopolamine or atropine with diethazine and sodium phenobarbital have the strongest antagonism to parathion. Better results were obtained when artificial respiration was combined with the administration of chemicals. Strophanthin and coramine are also effective when combined with artificial respiration.

-- Cond. from Chem. Absts.

- 74 Some Aspects of Liver Disease Caused by Industrial Poisoning. J. H. Thompson. Arch. Ind. Health 12, 522-527 (Nov. 1955).

Liver disease caused by industrial poisons represents approximately 2% of all industrial claims seen by internists. Such liver disease is usually secondary to exposure to various chlorinated hydrocarbons, either singly or in combination. The author's experiences with carbon tetrachloride and paradichlorobenzene are discussed; in these cases the combined exposure to these two chemicals produced cirrhosis of the liver, in spite of the fact that exposure to either chemical alone should not have caused cirrhosis. Combinations of liver toxins produce supplemental or additive effects, which make certain persons more susceptible to liver poisoning, and consequently, they become added industrial risks.

-- Cond. from author's summary

- 75 Safe Practice with Solvents. H. Allen. Chem. Age 73, 1008-1010 (Nov. 5, 1955).

Safety in the use of some of the most used solvents is discussed briefly. Tetrachloroethane is one of the worst offenders on account of its high toxicity. The reaction of trichloroethylene with aluminum dust has caused fires. It can be used safely if soda ash is added daily to neutralize the acid formed by decomposition. Benzene has a high acute and chronic toxicity. Ethylene chlorohydrin is dangerous at high temperatures and there is a long latent period between exposure and symptoms. Attention is called to the toxicity of carbon tetrachloride and the toxicity and fire hazard of carbon disulfide. Safety measures for the use of these solvents are discussed.

- 76 Experiences of the Clinica del Lavoro with Maximum Allowable Concentrations of Industrial Poisons. E. C. Vigliani and N. Zurlo. Arch. Gewerbepathol. Gewerbehyg. 13, 528-534 (1955). German.

Investigations at workplaces and examinations of workers have been conducted as an appraisal of the maximum allowable concentrations suggested by the American Conference of Governmental Industrial Hygienists. A table compares the limits suggested for 24 substances investigated with the 1954 ACGIH list. Higher limits are suggested for acetic acid (20 ppm) and nitrogen oxides (15 ppm) and lower limits for chromic acid and chromates (0.05 mg. per cu. m.) parathion (0.07-0.12 mg. per cu. m.), other insecticides (0.007 as TEPP), acetone (500 ppm), ammonia (50 ppm), and carbon monoxide (50 ppm). The limits for the remaining substances agree substantially with those adopted by the ACGIH.

-- Cond. from Bull. Hyg.

INDUSTRIAL DUSTS

- 77 The Agglutination of Harmful Dusts by Sodium Chloride Aerosols. L. LeBouffant. Rev. ind. minerale 36, 62-79 (1955). French.

The importance of suppression of harmful dusts, especially in the prevention of silicosis, and methods used are discussed. Agglutination by aerosols is fairly effective but rather slow. Agglutination velocity, which is proportional to the square of the number of particles, can be accelerated by higher concentrations. Sodium chloride atomized in dusty air does not increase the number of collisions between dust particles but only increases their size. The addition of a saline aerosol

equal in weight to that of dust in suspension has little effect on the size and thus on the speed of sedimentation. Even by agglutinating 0.2-micron particles to 0.5-1 micron, the size is not large enough to be retained in the bronchial tubes. It seems, therefore, that an artificial dust agglutination by a saline aerosol would require large amounts of sodium chloride and therefore is not a practical means for an effective suppression of harmful dusts. -- Cond. from Chem. Absts.

- 78 Silicosis and Dust Control—Vermont's Granite Industry. H. B. Ashe. Public Health Repts. 70, 983-985 (Oct. 1955).

The x-ray and dust control programs of the State health department began in 1937 and have gradually improved ever since. No case of silicosis has been discovered in any man who has worked only in the Vermont granite industry since 1937. This remarkable record is attributed mainly to effective dust control within the industry.

- 79 Coal-Miners' Pneumoconiosis in Four Collieries in County Durham. R. I. McCallum, R. C. Browne, and H. Campbell. Brit. J. Ind. Med. 12, 279-289 (Oct. 1955).

Statistics on the extent and degree of pneumoconiosis in County Durham show a remarkable similarity to those from South Wales. From the point of view of both the men and the industry it is better to allow men with pneumoconiosis to continue at their facework under medical supervision, if they are willing to do so, and to persevere with measures to make the work less dusty and so to reduce the risk of progression of simple pneumoconiosis or of fresh cases developing.

-- Cond. from authors' summary

- 80 Cavitation in the Massive Fibrosis of Coalworkers' Pneumoconiosis. G. S. Kilpatrick, A. G. Heppleston, and C. M. Fletcher. Thorax 9, 260-272 (Dec. 1954).

Massive fibrosis occurs in coalworkers whose lungs already contain a certain amount of coal dust and is probably tuberculous in origin. Cavitation often occurs in massive fibrosis and appears to be due to tuberculosis or ischemic necrosis, alone or in combination. Of 104 patients with progressive massive fibrosis, 26 had tubercle bacilli in the sputum during life. Difficulties in classification due to the presence of other bacilli in the sputum are discussed. Animal inoculation is important. The prognosis for patients in the sputum-positive group is poor. In the absence of a positive sputum, the prognosis for patients with cavitated progressive massive fibrosis is no worse than for those without cavitation. Treatment is unsatisfactory, but the sputum-positive cases should be given antituberculous drugs for their symptomatic benefit. Sputum-negative cases require only reassurance and possibly symptomatic treatment.

-- Cond. from Bull. Hyg.

- 81 Cor Pulmonale and Silicosis. P. H. Rossier, A. Buhlmann, and P. Luchsinger. Arch. Gewerbepathol. Gewerbehyg. 13, 486-495 (1955). German.

Cardiac failure as a cause of death in silicosis is second only to tuberculosis in frequency. The relation of cor pulmonale to silicosis is discussed extensively. Two general conditions leading to cor pulmonale are: (1) lowering of the alveolar oxygen tension or raising of the carbon dioxide tension, leading to a narrowing of the arterioles in the pulmonary circulation and consequently to increase of pressure; and (2) the reduced capillary stream, brought about by all the processes which cause loss of lung parenchyma and lead to hypertonus with increased capillary resistance. The electrocardiogram gives evidence of cor pulmonale in roughly half the cases, but is more reliable than radiological evidence. The etiological differentiation of cor pulmonale is important in prognosis and treatment. Investigations on 335 patients with silicosis showed a certain parallel between the severity of the silicosis and the frequency of cor pulmonale.

-- Cond. from Bull. Hyg.

- 82 Investigations on the Behavior of the Most Important Mineral Dusts in Human Lungs with Special Reference to their Chemical and Crystallographic Properties and Their Occurrence in Mining. M. Landwehr and E. Bruckmann. Beitr. Silikose-Forsch. No. 32, 132 pp. (1955). German.

This extensive paper deals with the relation between dust composition and concentration and observations on pneumoconiotic lung tissue sections with the polarizing microscope. Part 1 reviews the crystal structures of the chief minerals which occur in mine dusts, with illustrations of silicate and other structures. Part 2 describes the main rock types which occur in mining districts.

Size distribution of dust in mines is also extensively discussed. Part 3 is a selective review of the literature dealing with mineralogical observations, silica solubility, and animal experiments in silicosis research. Part 4 gives observations based on 500 sections from 62 lungs of normal persons and those exposed to various types of dust. In these observations, the percentage of quartz in the dust found in lung tissue was lower than would be expected from the composition of the airborne dust, but where it should have appeared extensive stains of doubly refracting interstitial tissue were seen. The authors conclude that quartz dissolves and produces fibrous tissue, probably through the intermediate action of colloidal polymerized silicic acid. If silicates are dissolved they produce silicic acid which is not polymerized but is rapidly excreted by the organism. On the other hand the percentages of talc and mica found in the lungs was higher than would have been expected. It is considered that such platy and fibrous minerals may be more difficult to remove by phagocytosis than isometric minerals, and their accumulation in the lungs may inhibit the lymphatic drainage and thus increase the fibrogenic action of dissolved silica.

-- Cond. from Bull. Hyg.

The Method of Knipping and Arterial Oximetry During Exercise in the Study of Respiratory Function in Silicotics. E. Sartorelli and C. Sbertoli. Med. lavoro 46, 126-132 (Feb. 1955). Italian.

Knipping's method (study of oxygen deficit) and the arterial oximetry method were compared in a study of normal and silicotic subjects. Details of the tests are given. It is concluded that arterial oximetry offers the advantages of greater rapidity of the tests and of better toleration by the patients; at times, however, it presents troubles of technical nature which render difficult its operation.

-- Cond. from English summary (Bull. Hyg.)

The Solubility of Quartz Dust. A. J. Beal and A. L. Godbert. (Great Britain) Ministry of Fuel and Power, Safety in Mines Research Estab., Research Rept. No. 115, 22 pp. (1955).

The solubility and rate of solution of silica dust are given as functions of the density of the dust suspension in the solvent (water or dilute salt solution), the fineness of the dust within the respirable size range (below 5 microns), the temperature, the rate of stirring, the pH value of the solvent, and the sodium chloride concentration of the solvent. A mechanism is suggested whereby the solution of silica dust is confined to local surface areas, which have been weakened by grinding solvent hydration in such a manner that they are less firmly attached to the body of the quartz crystal than are surrounding surfaces. No evidence was found that freshly ground quartz has any greater solubility due to active surfaces than does ground quartz which has aged for several months.

-- Chem. Absts.

Effect of Aluminium Salts on the Solubility of Quartz Dust and Its Electrokinetic Properties.

A. L. Godbert and R. K. Halpin. (Great Britain) Ministry of Fuel and Power, Safety in Mines Research Estab., Research Rept. No. 116, 18 pp. (1955).

The inhibition or retardation of the onset of silicosis in rats by addition of aluminum dust to quartz dust has been attributed to decrease in solubility of the quartz. The addition of aluminum salts to quartz-water suspensions, under suitable conditions of pH and of aluminum salt concentration, reduces markedly the amount of silica put into solution, by 90% under maximum conditions. This suggests that the effect is chiefly due to the removal of dissolved silica on the precipitate of aluminum hydroxide. The alternative explanation, that the aluminum agglomerates the silica molecules to a size which does not react with molybdate, is disproved by experiments. The lowering of the solubility of quartz by aluminum dust has been attributed to the adsorption of aluminum on the surface of the quartz particles. The formation of a barrier between the quartz-water surfaces is held to hinder the solution of the quartz. Such adsorption of aluminum should change the electrokinetic mobility of the quartz particles. This change occurs under a narrower range of conditions than does the large decrease in the solubility of the quartz. Adsorption of aluminum on the quartz particles is extensive enough to reverse the sign of the charge only when the pH of the solution is between four and seven.

-- Cond. from Chem. Absts.

Surface Activity of the Quartz Crystal. E. Quinot and C. Claeys. Rev. med. miniere 6, No. 23, 25-50 (1953). French.

The optical, electrical, and chemical properties of a solution of quartz dust from which particles had been thoroughly removed by centrifugation led to the conclusion that the solute consisted of highly polymerized silica, to the surface of which carbon dioxide was adsorbed.

-- Cond. from Bull. Hyg.

03120137

- 87 A Contribution to the Study of the Constituents of Serum in Cases of Silicosis. L. Christiaens, E. Baigairies, C. Claeys, and L. Lenoir. *Rev. med. miniere* 7, Nos. 26-27, 14-21 (1954). French.

A study was made to ascertain whether in cases of silicosis the constituents of the serum undergo any change which might be of value in diagnosing doubtful cases. The factors studied were: increase in sedimentation of red cells, haptoglobinemia, and alpha and gamma globulins. The results so far do not give statistically significant results. -- Cond. from Bull. Hyg.

- 88 Investigations into the Reactions of Human Serum to Silica. C. Claeys. *Rev. med. miniere* 7, Nos. 25-27, 22-30 (1954). French.

A short summary is given of the various theories of the mechanism of the action of silica on living tissue. Experiments with colloidal and crystalline silica showed a relation between the refractometric reaction and viscosity of the serum. The reaction seemed to be due to gamma globulins. Particle size and freshness of fracture were found to be factors. The importance of the inquiry is in laying stress on the activity of the superficial layers of silica crystals, an activity which passes away in the course of time. -- Cond. from Bull. Hyg.

- 89 Local Inflammatory Response Produced by Solutions Sterilized with Asbestos Type Filters. R. S. Speirs and U. Wenck. *Proc. Soc. Exptl. Biol. Med.* 88, 89-93 (Jan. 1955).

It was demonstrated that filtering through an asbestos type filter disc will change the local cellular responses of the organism to that solution. This reaction is due to particles and fibers which have pulled off the disc and are present in the filtrate at the time of injection. A similar eosinophilia appeared following injections of asbestos and talc, but not following silica, cotton, or paper fibers. Ground glass and mica produced only slight increases in the number of local eosinophils. It was pointed out that precautions should be taken to avoid accidental introduction of asbestos fibers from Seitz filters into serums and other biological materials intended for injection. These experiments demonstrate that a study of the local cellular responses to an injected material can lead to a better understanding of the effects of a solution upon an organism. -- Biol. Absts.

- 90 Some Cases of Mixed Pneumoconiosis Occurring in the Pottery Industry. F. Muller and L. Courcelle. *Arch. maladies profess.* 16, 149-153 (1955). French.

Three cases of pneumoconiosis are reported, in which the patients had been employed in making stoneware for several years. In each case the patient was seized suddenly with dyspnea, following a mild catarrhal attack. X-ray examination showed interstitial fibrosis with disseminated nodulation. Except for the dyspnea the general health was good. The sudden development of these cases was quite different from the slow onset of silicosis. The dust contained about 20% quartz. It is suggested that other dusts, particularly feldspar, may have masked the silica effect which was brought to light by a chance infection of the lungs. -- Cond. from Bull. Hyg.

- 91 Mixed-Dust Pneumoconiosis and Atelectasis. E. Uehlinger. *Arch. Gewerbepathol. Gewerbehyg.* 13, 496-507 (1955). German.

In contrast with the focal and compensatory emphysema which accompanies mixed-dust pneumoconiosis, atelectases have received little attention. Atelectases of segments and lobes of the lungs are the result of closure of bronchi; they can occur as the result of mixed-dust bronchitis, supervening bronchial tuberculosis, and bronchial or lung carcinoma near the hilum. The importance of large atelectases is that they cause reduction of the capillary surface in contact with the alveolar walls, and, by augmenting the compensatory emphysema, the respiratory dead-space is increased; respiration becomes difficult, even in rest, partial or complete invalidity results, and the progress of the pneumoconiosis is hastened. Two cases are recorded in detail. Both resulted from long exposure to iron, coal, and quartz. In one case a carcinoma was hidden by the dense shadow of the atelectasis, but apparently had no causal relation to it. -- Cond. from Bull. Hyg.

03120138

- 92 Fullers'-Earth Lung. H. Gattner. Arch. Gewerbepathol. Gewerbehyg. 13, 508-516 (1955). German.

Several cases of pneumoconiosis occurring in workers with fullers' earth are described in detail. The principal mineral constituent of the fullers' earth is montmorillonite, which has a lattice structure similar to that of the mica group. The percentage of quartz in the clays varied from zero to 20%. The conclusion is reached that the dust of this material is injurious although not capable of causing silicosis. This possibility has apparently not been recognized generally, and preventive measures have been neglected.

-- Cond. from Bull. Hyg.

- 93 Pulmonary Disease in Relation to Metallic Oxides. K. M. A. Perry. Lancet 269, 463-468 (Sept. 3, 1955).

If the oxides of metals are inhaled into the lung and remain in its lymphatics they will throw x-ray shadows, the density of which varies with the atomic weight of the metal. Some dusts are dissolved and are excreted by the kidney or intestines, but others remain and cause shadowing. Though they may be inert and may not give rise to fibrosis, they may interfere with elasticity. The following effects of various metallic oxides are discussed: baritosis, siderosis, stannosis, and argyrosiderosis as forms of pneumoconiosis; chemical pneumonia from the oxides of manganese, beryllium, and osmium; sarcoidosis caused by beryllium; emphysema from cadmium oxide; fibrosis caused by aluminum and its oxide; and carcinoma from arsenic and chromates. The literature on each of these dusts is reviewed in some detail. The possible relation of bronchitis and its complications to air pollution is discussed.

- 94 Zinc Stearate Lung. L. Noro and U. Uotila. Paper 239, 11th International Congress of Industrial Medicine (Sept. 1954).

The inhalation of zinc stearate dust is known as a cause of pneumonia in children, but its effects in the working environment are not so well known. The authors describe the fatal case of a worker employed for 29 years in a rubber plant. The clinical examination and autopsy showed that the cause of death was a diffuse fibrosis of the lungs. Histological tests for zinc were positive.

-- Arch. Ind. Health

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 95 Proceedings of the First West Coast Noise Symposium, Sessions 4 and 5. Noise Control 1, 10-65, 78-82 (Sept. 1955).

The papers presented at the first three sessions of the First West Coast Noise Symposium, Los Angeles, Dec. 3, 1954, were reviewed briefly in the September, 1955 Digest. The remaining papers were the following:

The Z24-X-2-Report. W. Rudmose.

An analysis is given of the preliminary report on "The Relations of Hearing Loss to Noise Exposure" by Exploratory Subcommittee X-2 of the American Standards Association Z24 Sectional Committee.

Role of the Industrial Physician in the Problem of Noise in Industry. T. G. Hanks.

Suggestions are given for the industrial physician's procedure in initiating and conducting a noise-control program.

Industrial Noise—Application of Control Measures by the Industrial Safety Engineer.

J. F. Hatton.

Protection of employees against noise is a part of the safety engineer's job. Quieting of machines by good maintenance, audiometric tests for employees, and ear protectors are discussed.

Employee Participation and Cooperation in Control Measures. D. G. Saurenman.

The success of any industrial plant noise-control program is in large part dependent upon the cooperation of the employees. Some positive steps are outlined for insuring this cooperation.

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The Status of Present Laws. F. J. Creede.

The author discusses the current legal situation in California with regard to hearing loss as it is covered by workmen's compensation laws.

Role of the Industrial Accident Commission. D. A. Campbell.

The compensation methods applied in California are outlined and a program is suggested for reducing the incidence of industrial hearing loss.

Methods of Noise Control—Personal Protection. P. S. Veneklasen.

Modern methods for ear protection include ear plugs, ear muffs, and helmets, separately or in combination. The various types are described and evaluated.

Ear Defenders: Measurement Methods and Comparative Results. J. C. Webster.

Ear defenders offer positive protection against loud noise, if they have sufficient attenuation and fit the wearer correctly. Methods of measuring the capabilities of ear defenders are outlined and results of measurements taken in a number of laboratories are reported.

General Principles of Reducing Noise in Machinery. S. M. Potter and H. C. Hardy.

Reduction of machinery noise at the source frequently involves changes of minor significance with regard to operation, but capable of reducing noise by a large factor. These simple changes often involve little or no increase in cost.

Design of Noise Control Structures. D. B. Callaway.

Where noise cannot be reduced at the source, the best method of noise control is to enclose the source. The effectiveness and application ranges of various types of barriers and enclosures are discussed.

Plant Planning for Noise Reduction. I. Dyer.

The best time to apply noise-control measures is in the design stage or at least prior to moving into a new plant or area. Site selection, plant layout techniques, and the choice of processes, machines, and machine mounts all influence the noise environment.

Summary of Symposium. R. H. Bolt.

General principles, rather than the content of the papers, are summarized in ten points, regarding the complexity of the problem, the need of cooperation with professional societies, the need of more symposiums, and the responsibility of management. The last point is "beware of single numbers", that is, no particular noise level should be taken as the criterion of the noise hazard, until all conditions are thoroughly understood and are circumscribed.

- 96 Historical Record of the Wisconsin State Fair Hearing Survey—1954. A. Glorig and D. E. Wheeler. Noise Control 1, 18-25 (Nov. 1955).

The survey was intended (1) to determine some of the effects of industrial noise on hearing in the population of Milwaukee and the surrounding territory, (2) to learn the relation of pure-tone and speech audiometry, and (3) to study the auditory threshold in large populations. All the persons tested were volunteers. The procedures and equipment are described. A brief summary of results is presented. A complete set of tables and graphs will be published in the near future.

- 97 On Occupational Deafness from White Noise. L. Bernabei. Riv. Audiol. Practica 3, 21-52 (1953). Italian. English translation available from Beltone Institute for Hearing Research, 2900 W. 36th St., Chicago 32, Ill.

The author has studied the injury caused to the human ear by the white noises (noises over a wide frequency range) of the boracic springs of the industries of Larderello. On the basis of the data supplied by the collective and individual examinations carried out with modern means on a large number of qualified workers attending to the different branches, all more or less affected by acoustic trauma (the chief physical characteristics of which are fully described) the author classifies two fundamental clinical kinds of deafness: apoplectic and gradual (or slow). Next he draws prophylactic conclusions as to the selection and utilization of the workers, the places where they work, and acoustic protection.

-- Author's summary

- 98 Noise Reduction in the Design of a Diesel-Engine Test House. P. A. deLange and G. J. van Os. Ingenieur 67, W74-W76 (June 17, 1955). Dutch.

This article describes a sound-proof test house for diesel engines and the methods used for obtaining a high degree of attenuation in both the test house and neighboring buildings. The features adopted include: double walls with a damping material between them; double doors; reinforced concrete beams for the roof; a plenum chamber for exhaust gases; and a sound-absorbing wall between the test room and the control room.

-- Cond. from Engrs. Digest

- 99 Evaluation of the Noise Field around Jet-Powered Aircraft. M. Kamrass and K. D. Swartzel. Noise Control 1, 30-39, 54 (Nov. 1955).

Following a review of the factors which affect the ground-level noise from aircraft in flight, a technique is discussed which permits the prediction of ground noise levels and indicates flight patterns which will permit minimum noise levels for those areas requiring a minimum of noise annoyance. -- Editor's summary

- 100 Evaluation of Equipment Noise. H. C. Hardy and D. E. Bishop. Heat, Pip. Air Cond. 27, 137-141 (Sept. 1955).

A brief survey is made of the present state of knowledge to permit stating what is not known and to outline needed research. Certain concepts of modern acoustical engineering are suggested as offering a means for measuring and evaluating noise of heating, ventilating, and air-conditioning equipment. Methods of procedure are outlined and a simple layout for applying the ideas to fans is included. Two examples illustrate proposed procedures. Specific suggestions are made covering the data missing and needed in order to make the noise determinations. -- Editor's summary

- 101 Noise from Small Centrifugal Fans. R. B. Goldman and G. C. Maling. Noise Control 1, 26-29, 50 (Nov. 1955).

Examination of experimental data from a number of small centrifugal fans leads to the development of an equation of fan noise having two parts readily associated with the development of static pressure and the production of flow. A technique is developed for the selection of fans to produce minimum noise for given conditions of flow and static pressure. -- Editor's summary

- 102 Fitting Eyesight to Job Needs. W. Meals. Factory Mgmt. & Maint. 113, 92-95 (Nov. 1955).

The successful results of several companies with vision control programs are cited, and it is emphasized that no company is too small to require a program. The factors in a good vision program include: measurement of vision of applicants with consideration of the work they are to perform; testing for field or range of vision, depth perception, coordination of eyes, and color blindness; and proper eye protection. The last includes individual goggles for each worker, and in many cases correction ground into their prescription safety glasses. An eye examination should be given and a new correction should be prescribed for use on the job.

- 103 Tolerance of Men to Work in Hot, Saturated Environments with Reference to Mines Rescue Operations. A. R. Lind, R. F. Hellon, J. S. Weiner, and R. M. Jones. Brit. J. Ind. Med. 12, 296-303 (Oct. 1955).

Thirty-six mines rescue personnel wearing self-contained breathing apparatus were exposed to a stipulated work routine in various saturated environments, and their "tolerance times" were determined. There was no demonstrable difference in tolerance time of men in two age groups (19-31 and 39-45 years) although minor physiological differences were detected. No difference was found in the ability of men in three occupational groups to work in saturated environments. The use of the information on "tolerance times" as it affects the mines rescue service is discussed. An appendix describes details of the rectal thermocouple used in the experiments. -- Authors' summary

- 104 Index for Evaluating Heat Stress in Terms of Resulting Physiological Strains. H. S. Belding and T. F. Hatch. Heat, Pip. Air Cond. 27, 129-136 (Aug. 1955). Reprints are available from the Foundation.

A rational approach is described and is proposed for evaluation of heat stress in terms of: (1) thermal load which is imposed on a standard man; (2) capacity of environment to accept the load; and (3) physiological capacity to meet the demands over a period of eight hours. The "standard man" represents a composite of young, fit, acclimatized men who have been subjects of physiological investigation of the effects of heat in the laboratory and in the field. -- Authors' summary

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- 105 Hot Jobs Will Be Cool Jobs. W. J. King. *Factory Mgmt. & Maint.* 113, 76, 77 (Aug. 1955).

The advantages of radiant heat shielding are discussed, choice of materials is indicated, and the following suggestions are given for location of shielding: (1) the shield should block all straight-line paths between the heat source and the object or person requiring protection; (2) it should not have physical contact with the heat source; (3) it should be highly reflective; and (4) it should not interfere with natural ventilation. Examples of the effectiveness of shielding are given.

- 106 Body Evaporation During Short Exposures to Various Temperatures, Humidities, Pressures, and Mass Velocities. J. W. McCutchan. *Heat, Pip. Air Cond.* 27, 151-154 (Sept. 1955).

Over the ranges tested, with two healthy young men as subjects, environmental temperature has by far the most significant effect on skin water loss by evaporation. The beneficial effect of reduced pressure on body temperature and hence the rate of heat storage is also significant.

-- Cond. from author's conclusions

- 107 The Energy Expended while Walking in Stooping Postures. T. Bedford and C. G. Warner. *Brit. J. Ind. Med.* 12, 290-295 (Oct. 1955).

Experiments on two subjects are reported in which the energy cost of walking—erect, stooping, and on all fours—was measured. At a given speed, when walking with a stoop sufficient to reduce a man's height by 20%, the energy cost was from 30 to 50% above that of normal walking, while walking with a stoop causing a height reduction of 40% caused 3 1/2 times, and walking on all fours 4 1/4 to 5 1/4 times as much energy as normal walking.

-- Authors' summary

- 108 Industrial Raynaud's Phenomenon with Gangrene. A. M. Desmond. *Proc. Royal Soc. Med.* 47, 19-20 (1954).

Gangrene is uncommon in Raynaud's phenomenon; as an industrial complication it is most unusual. A man, aged 50, had used a pneumatic drill without disturbance. Later the use of a club hammer and cold chisel was followed by Raynaud's phenomenon and ulcerated gangrene. Improvement occurred after sympathectomy. Trauma rather than cold was preferred as the interpretation of the causal background.

-- Biol. Absts.

- 109 Parkinsonism and Trauma. J. M. Nielsen and S. L. Marvin. *Bull. Los Angeles Neurol. Soc.* 19, 93 (Dec. 1954).

The authors present several lines of evidence that Parkinsonism is an enzyme disease, and that trauma is very improbable as a cause. They present the histories of two patients, which illustrate that, when Parkinsonism follows trauma, a pure picture of Parkinsonism does not appear. However, trauma may precipitate a syndrome of loss of associated movement, with rigidity, mask-like facies, and even tachylalia. The third patient, whose case is presented, had been working with copper, zinc, and cadmium but had not sustained a trauma. Mixed radicular and Parkinson symptoms referable to the right arm developed. The case shows that, if trauma had occurred, the symptoms of Parkinsonism might have been ascribed to trauma.

-- Cond. from Arch. Ind. Health

RADIOACTIVITY AND X-RADIATION

- 110 Instruction in X-Ray Protection. Mary H. Brocklage. *X-Ray Technician* 26, 443-444 (May 1955).

Instruction in x-ray protection should be an important part of all radiologic technology courses. The following points should be stressed: (1) the history of exposure of early workers and the subsequent development of protective measures; (2) protection of the patient by obtaining

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data on previous irradiation and by accurate technique in diagnosis and treatment; (3) protection of the technician by suitable shielding and by observing rules of caution with regard to hand and body positions; and (4) prevention of shock by checking ground connections and by the technician's keeping one hand behind him to avoid entering the circuit the patient may be in, thus protecting himself and the patient.

-- Cond. from Public Health Eng. Absts.

- 111 Radiological Health—An Over-All View. S. A. Lough. Am. J. Public Health 45, 1447-1453 (Nov. 1955).

The scientific, medical, and industrial uses of radiation are reviewed, and future problems are considered. Administrative machinery for control of radiation hazards is discussed. Radiation can be used safely; its benefits to the public are great and will become even greater; adequate regulations governing such use should not and need not be so restrictive that the benefits cannot be realized legally. One important way to make sound progress is to make haste slowly; and, finally, we must be ready to revise any code when our experience teaches us that changes are desirable.

- 112 Radioactive Poisons. J. Schubert. Sci. American 193, 34-39 (Aug. 1955).

The production of artificial radioactive materials is raising the levels of radioactivity to which man may be exposed. Such radioactive atoms and molecules which accumulate in certain tissues after entering the body and subject them to damaging radiations are referred to as radioactive poisons. These are extremely difficult to deal with, due to the extreme smallness of a toxic dose and the possibility of greatly delayed effects. Aspects discussed are the slow development of an awareness of radioactivity hazards, factors in biological retention and damage, maximum permissible amounts allowable in the body, methods of measuring amounts in the body, techniques for removal of ingested radioactive materials, cautions to be observed in using radioisotopes, and need to investigate genetic effects of long storage of these materials in the body.

-- Public Health Eng. Absts.

- 113 Some Effects of Periodic X-Radiation. L. E. Moon, H. F. Harlow, and G. P. Bogumill. Science 122, 863, 864 (Nov. 4, 1955).

The effect of repeated mild doses of x-radiation on progressive physiological and behavioral changes in animals was studied. Twelve of 23 monkeys were exposed periodically. The results of other researchers are confirmed in showing that divided doses are not as lethally effective as a single dose, but no definite estimate of LD₅₀ is justified. Weight, appetite, and locomotor activity were adversely affected. Every irradiated animal subjected to autopsy showed severe pathological changes in at least one organ system, most frequently the lungs, heart, kidneys, and large intestine. Anemia occurred in a number of animals. Prior to radiation the animals were given extensive training on various tests that have been shown to differentiate between normal animals and those with various types of brain damage. No evidence of brain damage due to radiation is indicated on the basis of these tests; in fact, on the average the irradiated monkeys were significantly superior to the controls on both oddity and delayed-response tests during the last two tests months, even on the verge of death.

- 114 Thrombocytopenic Purpura in X-Ray Technicians. A. Bohme and Oberste-Berghaus. Strahlentherapie 97, 292-296 (June 1955). German.

As a result of continued duty as assistants in an x-ray establishment, two girls had a slight attack of thrombopenic purpura which disappeared upon interruption of their work. They, however, relapsed when resuming their duty and are continuously suffering from a slight thrombopenia.

-- Nuclear Sci. Absts.

- 115 Blood Histamine Level and Skin Erythema Determinations Following Exposure to Single Doses of X-Radiation. L. Koslowski, H. Poppe, and E. Walther. Strahlentherapie 97, 266-271 (June 1955). German.

The authors examined the histamine level in the blood of 20 individuals submitted to a single roentgen irradiation of 400r. In 18 persons they determined an increase in histamine of 45 to 400 micrograms per liter, or 33 to 253%. No formation of erythema was observed. It is assumed that histamine is formed from histidine or by decomposition of cells in the skin. -- Nuclear Sci. Absts.

- 116 Calcium EDTA and the Excretion of Plutonium. H. Foreman, T. T. Trujillo, O. Johnson, and C. Finnegan. *Proc. Soc. Exptl. Biol. Med.* 89, 339-342 (July 1955).

A comparison of calcium EDTA and zirconium citrate for the therapy of acute plutonium poisoning showed that Ca EDTA caused greater plutonium excretion than did the zirconium citrate. A combined treatment produced the same results as zirconium citrate alone. Ca EDTA administered long after plutonium was deposited in bone removed it very slowly. The addition of sodium EDTA to the calcium salt did not affect its action. Ca EDTA did not influence the passage of plutonium across the lung alveolar membrane, did not influence its rate of mobilization from an intramuscular site, and did not influence its rate of absorption from the gastrointestinal tract.

-- Cond. from authors' summary

- 117 The Handling of Plutonium in Laboratories: Precautions. H. J. Dunster and E. J. Bennellick. *Atomics* 6, 312-320 (Oct. 1955).

An outline is given of the standard of laboratory facilities required for handling plutonium at levels up to about ten curies. The use of glove boxes is discussed and methods of monitoring of air and urine are given. Emergency procedures are suggested.

-- Editor's summary

- 118 The Significance and Value of Uranium in Urine Analysis. A. Butterworth. *Trans. Assn. Ind. Med. Officers* 5, 36-43 (July 1955).

So far as inhalation hazards are concerned, the results of group analysis of uranium in urine appears to be a very useful guide to conditions in various parts of the atomic energy establishment. This type of investigation may be at least as valuable as intermittent atmospheric surveys. A urinary uranium concentration greater than 100 micrograms per liter is definitely indicative of recent absorption, whereas a concentration of less than 40 may be due either to slow uptake from the site of absorption or to bone mobilization. Follow-up determinations should be made on workers whose excretion reaches the higher value. Among the subjects discussed are: the value of collecting specimens at the end of the period of employment; the greater effect of small particle sizes; the more rapid excretion in man than indicated by animal experiments; more complete intestinal absorption than heretofore indicated; the rarity of pathological albuminuria; and the role of bone absorption.

-- Cond. from author's summary

- 119 The Control of Radioisotopes. G. W. Morgan. *Modern Sanit.* 7, 18-20, 52, 53 (Nov. 1955).

The role played by the Atomic Energy Commission in the control of radioactive materials in industry is explained. The Isotopes Division has developed a licensing procedure and an educational and visitation program. During visits prior to licensing the facilities, techniques, disposal methods, and over-all radiological problem of the applicant are carefully evaluated, and recommendations for correction are made. Recommendations covering the general phases of radiological safety have been drafted and when published will have the effect of law. Specific criteria for evaluations of different programs have been developed. Close cooperation between state agencies and the AEC has resulted in mutual understanding of their problems.

- 120 Contamination of Surfaces by Radioactive Materials: The Derivation of Maximum Permissible Levels. H. J. Dunster. *Atomics* 6, 233-239, 250 (Aug. 1955).

This article is a revised version of the (British) Atomic Energy Research Establishment Report H. P./R. 1495. The health problems caused by the radioactive contamination of surfaces are assessed and maximum permissible levels of contamination are proposed for surfaces leaving radioactive working areas and for surfaces retained in such areas.

- 121 The Safety of Nuclear Reactors. C. R. McCullough, M. M. Mills, and E. Teller. *Chem. Eng. Progr.* 51, 446-450 (Oct. 1955).

Until really safe nuclear machines of the future become available, reactors must be constructed with extreme circumspection and must continue to be operated with the same caution after ten years of safe running as when they were first constructed. Various phases of their hazards are

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discussed: contained radioactivity, escape of radioactivity, nuclear runaway, delayed energy production, and exothermic chemical reactions. A nuclear reactor does not produce a nuclear explosion even remotely approximating that of an atomic bomb. However, it is possible that large amounts of radioactive material might be released by a runaway, and therefore reactor sites should not be near populous or industrial areas. Since this is not always possible, it is necessary to use all possible safeguards.

- 122 The Problem of Insuring Nuclear Installations. M. M. Bradeich. Chem. Eng. Progr. 51, 513-516 (Nov. 1955).

A special group of insurance executives has been conducting a survey of atomic facilities to develop information and criteria on the insurability of industrial installations. This article is based on the author's experience as a member of the group. Many problems are involved, and more study is needed. A practical program for achieving maximum safety is outlined.

- 123 Radiation Tolerance Control. A. Graves. Atomics 6, 278-281 (Sept. 1955).

The author discusses the effect of radiation upon human tissue and puts forward the suggestion that the control of tolerance of radiation can be obtained by varying the liquid content of the tissue.
-- Editor's summary

- 124 Shielded Box for Chemical Work. J. Rydberg. Nucleonics 13, 65 (Oct. 1955).

This paper describes a box for chemical operations with radioactive materials where the radiation is of the order of one curie. The cost should not greatly exceed that of a lead shielded dry box, and its flexibility equals that of a Brookhaven hot cell.

- 125 Disaster Monitoring with Amateur and Commercial Photographic Films. G. M. Corney and H. M. Cleare. Nucleonics 13, 40, 41 (Aug. 1955).

In the event of an atomic disaster, widely distributed stand-by dosimeters might be extremely valuable, even if they gave only approximate indications. Photographic films ordinarily stored in commercial stocks and homes might fulfill this need. Calibration of a number of such films showed that, in spite of several sources of error they are sufficiently accurate for that purpose.

- 126 Radioactive Fallout in the United States. M. Eisenbud and J. H. Harley. Science 121, 677-680 (May 13, 1955).

This report summarizes the data accumulated up to the present time by the fallout monitoring network of the U. S. Atomic Energy Commission. The data are representative of the entire area of the United States, except that within 200 miles of the Nevada Test Site. The network consists of 89 sampling stations when tests are under way in Nevada, and only 41 at other times. The methods of collecting samples and of preparation for analysis are described. The accumulation of total fission products deposited throughout the country since 1951 varies from 21 millicuries per square mile in Arizona to 120 in New Mexico (excluding Nevada). Of the long-lived constituents of the radioactive debris, strontium 90 is of most interest because of its relatively long half-life (25 years) and the possibility that it may be deposited in human bone. However, it is estimated that the accumulation of strontium 90 would have to be increased about 1,000,000 times before biological effects could be recognized. In a few places relatively heavy fallout was caused by a combination of meteorological coincidences. The bulk of this radioactivity is eliminated by decay in a few hours or days after the fallout. An example of relatively heavy fallout was the radioactive rain in Troy, N. Y., of April 1953. At no place except in the immediate vicinity of the test site is there a sustained elevation of the background sufficient to be demonstrated by direct measurement of the gamma background in the area.

-- Cond. from APCA Absts.

- 127 Radioactive Fallout. 3. R. E. Lapp. Bull. Atom. Sci. 11, 206-209 (June 1955).

The persistence of fallout for weeks and months is as radical a departure in weapon effects as is the vast area of fallout, and this means that civil defense must contend with a "shelter phase"

not of a few days, but of a considerable number of weeks. Protection afforded by several types of shelter, post evacuation from cities, and the internal hazard from the intake of fission products into the body (particularly strontium 90) are discussed. Assuming that 10% of the fission yield is in the form of tiny particles which settle to the earth in one year or less, the author has calculated that 1500 superbombs of 20-megaton power could produce global contamination equal to that stipulated for workers in atomic laboratories (50 mr per day), and he concludes that the problem of global contamination is of minor importance as compared with local radioactive fallout. -- APCA Absts

- 128 Production of Cataracts in Animals by X-Rays and Fast Neutrons. P. J. Leinfelder, T. C. Evans, and E. Riley. Radiology 65, 433-438 (Sept. 1955).

Radiation cataract is a real but not a vital hazard. In most instances it can be avoided by the use of proper precautions. With lower dosages, progressive changes are not as likely to occur as with higher exposures. The development of radiation cataract demonstrates some of the mechanisms of biologic actions of ionizing radiation. Cataract is a more likely hazard for neutron workers than for those who may be similarly exposed to x-radiation.

-- Authors' summary (Nuclear Sci. Absts.)

- 129 External Radiation Exposure in the Radium-Dial Painting Industry. J. E. Silson, M. Kleinfeld, and S. J. Harris. Arch. Ind. Health 12, 503-508 (Nov. 1955).

The environmental histories of two persons who worked in a radium-dial painting plant in occupations other than as painters and who died of aplastic anemia are presented. The internal radiation component from inhaled or ingested radium, as determined by both breath radon samples and measurements on the tissues at autopsy, was negligible in the first case and not appreciably above permissible in the second. Evaluation of their work histories, however, indicated a probable high exposure to external radiation. This consisted principally of exposure, in the first case, to the packaging of large numbers of finished items coated with radium and, in the second case, to the processing of large batches of radium-containing phosphors inside a poorly designed hood which had become contaminated and itself productive of a hazardous dose rate. Recommendations to prevent the future occurrence of illness or death from this type of exposure are made.

-- Authors' summary

- 130 The Long-Term Aspect of Fission Product Disposal. E. Glueckauf. Atomics 6, 270-276, 281 (Sept. 1955).

On the basis of a world production of nuclear energy requiring 1,000 tons of nuclear fuel per annum, it is calculated that the total radiation from fission products of more than one year of age would be about the same as that released by the potassium contained in the ocean. However, after separation of strontium and cesium, followed by 13 years' storage, and subsequent release of the remaining bulk into the ocean, the resulting equilibrium radiation would be negligible compared with the natural potassium radiation of ocean water. In any disposal plan, absolute safeguards must be provided against entrance of fission products into food or water supplies, and against accidental exposure of the public to excessive radiation. Safe access to mineral wealth above or below ground must be assured. The proposed scheme must be as economical as possible. The author concludes that there are three economical ways of satisfying all these requirements: (1) permanent control of fission products by underground storage of solutions in tanks; (2) immediate disposal of highly concentrated solutions on land in remote and uninhabited areas; and (3) quantitative separation of strontium and cesium from the bulk of the fission products, followed by careful control of the small quantities of these long-lived elements and by disposal of the remaining bulk. Detailed suggestions are given for this method of disposal. This method may prove to be the most economical, and will certainly be, if industrial uses for the radiations from strontium and cesium can be found.

-- Cond. from editor's summary

- 131 The Management and Disposal of Radioactive Wastes. A. Wolman and A. E. Gorman. Chem. Eng. Progr. 51, 470-474 (Oct. 1955).

The sources, treatment, and disposal of the various types of radioactive wastes are discussed, including raw materials, fumes and dusts, coolants from nuclear reactors, and isotopes. Future problems are considered.

03120146

ENVIRONMENTAL MEASUREMENTS

- 132 A Method for Generating Vapor Having the Composition of a Parent Solvent Mixture. F. Rieders and W. A. Hodes. *Arch. Ind. Health* 12, 509-510 (Nov. 1955).

A method is described which permits the production of a vapor which corresponds in percentage composition of constituents to that of a mixed parent solvent. -- Authors' summary

- 133 A Method for the Determination of Carbon Monoxide in Blood. P. J. Lawther and G. H. Apthorp. *Brit. J. Ind. Med.* 12, 326-329 (Oct. 1955).

A method is described whereby blood carbon monoxide may be simply and accurately determined by infrared spectroscopy after extraction under vacuum. The standard deviation of ten determinations at 2.88 ml. CO per 100 ml. blood was 0.02, and of ten determinations at 13.15 ml. CO per 100 ml. blood was 0.08. The method was found to be linear over the range 0 to 12 ml. per 100 ml. blood. -- Authors' summary

- 134 A Simple Micro Method for Blood Carbon Monoxide Determination. H. I. Chinn, Nancy E. R. Pawel, and R. F. Redmond. *J. Lab. Clin. Med.* 46, 905-909 (Dec. 1955).

A rapid, simple method for estimating the carbon monoxide content of blood is described, whereby the CO is liberated from the carboxyhemoglobin by one reagent and determined colorimetrically by drawing the CO through another reagent in a commercially available sampling tube. -- Authors' summary

- 135 Rapid Method for Determining Low Concentrations of Chlorine Dioxide in Air by Means of Detector Tubes. T. Kitagawa and Y. Kobayashi. *J. Chem. Soc. Japan, Ind. Chem. Sect.* 58, 177-179 (1955).

Chlorine dioxide (0.3 to 300 ppm) in air was determined by measuring the length of color change in part of a detecting column composed of silica-gel granules which had been immersed in o-tolidine solution and dried. The working curves expressing the linear relation between log length of color change and of concentration and temperature are given. The presence of oxidizing gases should be avoided. -- Chem. Absts.

- 136 Determination of Hydrazine and Ammonia in Air. H. McKennis, Jr. and L. B. Witkin. *Arch. Ind. Health* 12, 511-514 (Nov. 1955).

A procedure has been developed for the determination of hydrazine and ammonia in air. Advantage is taken of the difference in vapor pressures of aqueous hydrazine and aqueous ammonia, which permits the latter to be separated from the former. In this manner ammonia can be determined by nesslerization without interference from hydrazine. Hydrazine can be determined before or after removal of ammonia from the acidic solution which is used to collect hydrazine and ammonia from air. -- Authors' summary

- 137 The Estimation of Ozone at High Dilutions by Electrometric and Colorimetric Methods. J. N. Pring. *J. Appl. Chem.* 5, 338-346 (July 1955).

A highly sensitive method based on the measurement of the oxidation potential of a bromine-hydrobromic acid electrode has been devised for the estimation of ozone at high dilutions. The procedure which is determined by an equilibrium condition does not require complete absorption of the highly dilute ozone by the reagent to be effected and is independent of the total volume of air passed. The method is not appreciably affected by oxides of nitrogen or other oxidizing substances at concentrations which occur in the atmosphere. The measurements have been compared with the color changes given by potassium iodide-starch papers. The system remains to be applied to air tests in districts of uncontaminated atmosphere in association with meteorological observations. -- Author's summary

- 138 Determination of o-Tolidine and o-Dianisidine and Their Metabolites in Urine and Organs. P. Engelbertz and E. Babel. *Zentr. Arbeitsmed. u. Arbeitsschutz* 4, 179-183 (1954). German.

The method described in the preceding abstract was extended to the determination of o-tolidine and o-dianisidine in the urine of workers. Limits of detectability are given. In the metabolism of benzidine, hydroxyl-containing compounds are probably formed. -- Cond. from Chem. Absts.

- 139 Determination of Benzidine and Its Metabolites in Urine and Organs. P. Engelbertz and E. Babel. *Zentr. Arbeitsmed. u. Arbeitsschutz* 3, 161-168 (1953). German.

A new method is developed for determination of very small quantities of benzidine in urine of individuals after inhalation of benzidine. The method is also suitable for the determination of dianisidine, tolidine, dichlorobenzidine, dichloroanisidine, 1- and 2-naphthylamine, and other aromatic bases and hydroxy compounds. Working details are given in *Chem. Absts.* 49, 12578-12579 (Sept. 25, 1955).

- 140 Chemical Determination of Dieldrin in Crop Materials. A. E. O'Donnell, H. W. Johnson, Jr., and F. T. Weiss. *J. Agr. Food Chem.* 3, 757-762 (Sept. 1955).

Two analytical methods are described for the determination of dieldrin in plant materials. Both methods involve the separation of dieldrin by extraction and chromatography. The spectrophotometric method following described chemical treatment proved to be more specific and sensitive than the chlorine method. Both methods can be used to determine dieldrin residues of 0.1 ppm or more in a wide variety of crops. -- Cond. from authors' summary

- 141 Colorimetric Determination of Ethyl 4,4'-Dichlorobenzilate (Chlorobenzilate) as a Spray Residue. H. J. Harris. *J. Agr. Food Chem.* 3, 939-941 (Nov. 1955).

A colorimetric method is presented for the microdetermination of the acaricide, Chlorobenzilate, as a spray residue. The method has been further developed to determine the compound in the presence of DDT. -- Cond. from editor's summary

- 142 Modification of Ferrous Thiocyanate Colorimetric Method for Determination of Some Atmospheric Oxidants. G. W. Todd. *Anal. Chem.* 27, 1490-1492 (Sept. 1955).

No satisfactory method for measuring the oxidants produced by the reaction of ozone with hydrocarbons in the gas phase has been available. The ferrous thiocyanate method for the determination of peroxides was modified and used for the determination of gaseous oxidants. The reagent responds to very low concentrations of the reaction products of ozone and hexene or gasoline but is fairly insensitive to ozone alone. It is somewhat sensitive to nitrogen dioxide but not to nitrous oxide, formic acid, formaldehyde, valeric acid, or isovaleraldehyde. It appears to be useful in sampling naturally polluted atmospheres as well as atmospheres artificially polluted with various ozonated hydrocarbons. -- Editor's summary

- 143 The Colorimetric Determination of Silicon in the Microanalysis of Biological Material and Mineral Dusts. E. J. King, B. D. Stacy, P. F. Holt, D. M. Yates, and D. Pickles. *Analyst* 80, 441-453 (June 1955).

The basic ferric acetate procedure for removing phosphate from solutions in which silica is to be determined has been critically investigated. Unless the pH is strictly controlled, the method may give inaccurate results, owing to incomplete removal of phosphate or removal of silica with phosphate. Both phosphate and silica combine with molybdate in weak acid, but only the silicomolybdate complex is reduced in strong acid. On this principle a new procedure is described for determining silica in biological materials, in which phosphate is left in solution. Iron, in amounts greater than those occurring in tissue, does not interfere. In urines with high phosphate concentrations, two methods have been evolved to avoid interference by precipitation of ammonium phosphomolybdate. In one, phosphate is partly or completely removed by calcium hydroxide; in the other, ammonia and urea are removed with nitrous acid and sodium molybdate is used to couple with silica. The procedure gives good agreement with gravimetric determinations, both in analyses of biological materials and of mineral dusts. -- Cond. from authors' summary

- 144 Size Distribution and Concentration of Air-Borne Dust. K. T. Whitby, A. B. Algren, and R. C. Jorden. Heat. Pip. Air Cond. 27, 121-128 (Aug. 1955).

Measurements of particle size distribution of air-borne dust samples taken in the particle technology laboratory made by light microscope and centrifuge sedimentation are reported. Their validity was checked by comparison of the calculated optical densities with those measured by photometric evaluation of dust spots. This investigation indicates that sedimentation size analysis of air-borne dusts collected on millipore filters in combination with photometric evaluation of dust spots is a practical procedure for evaluating the size distribution of air-borne dusts, down to about 0.3 micron. Other experiments in combination with calculations from light scattering theory show that the dust spot method for evaluating air-borne dust concentrations is most sensitive to particles between 0.3 and 1.5 microns with peak sensitivity at about 0.7 micron.

-- Authors' summary

- 145 A New Particle Size Analyzer. M. E. O. Trowbridge. Ind. Chemist 31, 195-196 (Apr. 1955).

The author describes a new instrument for the determination of particle size and its applications. It records the data automatically and has reduced the time required for a particle size distribution analysis to as little as 15 min. In operation, a well deagglomerated cloud of particles is introduced into the top of a sedimentation column, and the particles are allowed to fall on the pan of a servoelectronic balance at the bottom. The accumulating weight on the pan is instantly counter-balanced electrically and recorded on a moving chart millimeter. This chart, a record of weight vs. time, is converted into a continuous particle-size distribution curve through the application of a template incorporating Stoke's Law. The micromerograph is useful both in production and quality control and as a research instrument. The statistical accuracy for routine testing is quite high, due to the large number of particles (amounting to several billions) in the sample used. The operating range of the instrument covers a very wide variety and size range of powders. Approximate upper and lower operating limits follow: resin, 250 and 3 micron; limestone, 170 and 2 micron; nickel, 90 and 1.2 micron; and tungsten carbide, 70 and 0.8 micron.

-- APCA Absts.

- 146 A Particle-Profile Test Strip for Assessing the Accuracy of Sizing Irregularly Shaped Particles with a Microscope. H. H. Watson and D. F. Mulford. Brit. J. Appl. Phys. Suppl. 3, 105-108 (1954).

The authors prepared the test strip by photographic microreduction of tracings of magnified (X1000) coal-dust particles, calculated their mean projected diameters, and asked nine observers to estimate the sizes of selected particle profiles in terms of circles of a Patterson-Cawood graticule. The accuracy and consistency of the estimations are summarized. Five observers underestimated the sizes and four overestimated, and all were consistent in the direction of their bias. The usual trend is toward oversizing, and the opposite finding in this experiment may be due to the fact that all of those who undersized were experienced observers and had made overcorrection for the usual bias. Extreme bias in either direction tended to increase with decreasing particle size, but for average observers this effect was small. The score of correct estimates was not generally dependent on the time taken by an observer. The authors conclude that their method gives a quantitative estimate of observer bias, which may be reduced or eliminated by training.

-- Arch. Ind. Health

- 147 Sampling Air by Vacuum from Auto Manifold. A. J. White. Chem. Eng. 62, 218, 220 (Oct. 1955).

Chlorine was determined in air by absorption in o-toluidene solution and colorimetric comparison. In cold weather when other apparatus would be inconvenient, the vacuum manifold for the windshield wiper of the station wagon proved satisfactory for drawing the air through the solution.

03120149

PREVENTIVE ENGINEERING

- 148 Operating Economics of Air-Cleaning Equipment Utilizing the Reverse Jet Principle. W. B. Harris and M. G. Mason. Ind. Eng. Chem. 47, 2423-2425 (Dec. 1955).

The information presented in this report covers the operation of 18 dust collectors using the reverse jet principle. The data reported include capacities, pressures, air flow, dust loading,

cleaning efficiencies, and expense. The average efficiency under all conditions is 99.986%. The over-all annual cost is 32 cents, per year per cubic foot per minute for all equipment. Higher efficiency and lower annual costs are obtained for suitably designed equipment. Three wet collectors described by another investigator operate at 93.5% collection with an annual cost of 19.7 cents per cubic foot per minute.

- 149 Electrostatic Precipitator Studies for Open-Hearth Gas Cleanings. R. G. Thompson, T. L. Myron, and C. J. Davis. *J. Air Pollution Control Assn.* 5, 139-141, 182 (Nov. 1955).

With the increasing emphasis on the abatement of air pollution, the cleaning of open-hearth stack gas has become a subject for intensive studies. Tests are described with pipe-type and dry-plate-type precipitators. The general conclusions are: (1) the pipe-type unit is inherently more efficient than the dry-plate unit; (2) the uniform distribution of gas flow among the few individual pipes in a small unit cannot be approached in a larger unit containing a multiplicity of cleaning ducts; and (3) in a large unit it is impossible to get the many electrodes perfectly positioned, and therefore the tendency toward arcing is greater in a large unit, and lower voltages must be used with some sacrifice in cleaning efficiency. Tests on other types of precipitators, such as a high-energy wet scrubber, are being made.

- 150 Collection of Aerosol Particles in Presence of Electrostatic Fields. H. F. Kraemer and H. F. Johnstone. *Ind. Eng. Chem.* 47, 2426-2434 (Dec. 1955).

A fundamental study of the deposition of particles on stationary spherical and cylindrical obstacles from a moving air stream in the presence of electrostatic forces is of value in predicting the performance of new types of equipment. Theoretical equations were derived for the fraction of the aerosol deposited. An electronic digital computer was used to solve the equations. The deposition of homogeneous dioctyl phthalate aerosols on a spherical collector was measured experimentally with various combinations of charged and uncharged collectors and aerosol particles. The experimental results agree with the theory within the accuracy of the analytical methods used to measure the deposition. As a result of the investigation, two new types of dust collection are proposed for pilot plant study.

-- Editor's summary

- 151 Pilot-Plant Studies of a Continuous Slag-Wool Filter for Open-Hearth Fume. C. E. Billings, W. D. Small, and L. Silverman. *J. Air Pollution Control Assn.* 5, 159-166 (Nov. 1955).

This report includes laboratory investigations of the resistance and efficiency of commercial spun-slag wool fibers used to filter iron oxide contained in a high-temperature gas stream (600° to 1200°F). Field tests of slag-wool filters used to operate open-hearth fume at 400° to 700°F are also reported. Laboratory studies indicate that collection efficiencies over 90% may be obtained under described conditions. Field studies of a continuous web of slag wool showed variations in efficiency from 10 to 90%. Mechanical factors tending to lower the efficiency were determined, and suitable redesign may eliminate these faults. Based on field studies, it was found that the average 250-ton hot-metal open-hearth furnace would require 1 to 3 tons of slag wool per day to filter stack gas.

-- Cond. from authors' summary

- 152 Visual Clarity in Kiln Discharge Gases. S. C. Hayes, N. M. McGrane, and D. B. Perlis. *J. Air Pollution Control Assn.* 5, 171-172, 186 (Nov. 1955).

The problem of collecting dust from kiln discharge gas in asphalt plants has existed for a long time, and no satisfactory method has been available to obtain visual clarity in the stack discharge. The investigation described in this paper indicates that the knowledge gained and recent developments in filter fabrics will permit the application of reverse-jet collectors to any asphalt preparation plant, will result in stacks with no visible discharge, and will relieve the operator of the high maintenance cost and trouble of wet collectors.

-- Cond. from authors' summary

- 153 Fume Problems in Electric Smelting and Contributions to Their Solution. M. O. Sem and F. C. Collins. *J. Air Pollution Control Assn.* 5, 157-158, 187 (Nov. 1955).

Progress in successful fume control by electrostatic precipitation in open and closed electric smelting furnaces is described, especially in a Norwegian smelter.

03120150

COMMUNITY AIR HYGIENE

- 154 Recommended Standard Method for Continuing Dustfall Survey (APM 1-a). Air Pollution Control Assn., Committee on Air Pollution Measurements. J. Air Pollution Control Assn. 5, 176-181 (Nov. 1955).

The suggested standard method applies to the measurement of average rate of a dustfall over a large area. The problem of locating specific sources of pollution will be considered in a later publication. The standards include: design of collector; classification of the area; selection of sampling sites; length of sampling period; collection and analysis; reporting of data; interpretation; and recommendations for future work. The use of limits in computation, reliability of a mean, significance of a difference, and an illustrative case are discussed in an appendix.

- 155 Air Pollution Damage to Vegetation. M. Katz and Violet C. Shore. J. Air Pollution Control Assn. 5, 144-150, 182 (Nov. 1955).

Literature on the types of injury and mechanism of injury to vegetation by air pollutants is reviewed. An investigation of the effects of various pollutants is reported, dealing mainly with coniferous trees in the Greater Windsor area of Ontario. Air pollution may in some cases be non-specific in character, but the order of susceptibility of various species to air pollution damage is a useful guide as to the probable causative agent. The mechanism of damage is discussed extensively.

- 156 Air Pollution—a Big Problem Today. L. L. Falk. Factory Mgmt. and Maint. 113, 98-104 (Aug. 1955).

The emphasis in this paper is on the responsibility of the individual plant owners. Suggestions are given on ways of telling whether the plant is an air polluter, methods of diagnosing the plant's problem, and methods of abatement, including collecting methods. The requirements of air pollution laws are briefly discussed. A company which does everything reasonably justified to solve its own air pollution problem should tell its neighbors about it.

- 157 Tailoring the Air-Pollution Ordinance to Community Needs. A. C. Stern. J. Air Pollution Control Assn. 5, 151, 152, 181, 182 (Nov. 1955).

Zoning ordinances have not proved to be by themselves sufficient legislation for air-pollution control. They are ineffective against residential, mobile, and portable sources. If a community must choose between the two forms of ordinance, an air-pollution control ordinance alone is preferable to a zoning ordinance alone. However, a small community gets the best legislative package by adopting both an air pollution control ordinance and a zoning ordinance, each of which is tailored to supplement and complement the other.

-- Author's conclusions

- 158 Prevention of Atmospheric and Water Pollution in the Chemical Industry. Symposium, Society of Chemical Industry, London Section, Apr. 4-5, 1955. Chem. & Ind. No. 41, 1266-1286 (Oct. 8); No. 42, 1304-1330 (Oct. 15); Discussion, No. 43, 1363-1377 (Oct. 22, 1955).

The following papers were presented: "Abatement of Air Pollution in the Chemical Industry", W. A. Damon. "Atmospheric Pollution and the Zinc Industry", E. Wallis. "Effluents from the Manufacture of Superphosphate and Compound Fertilizers", K. A. Sherwin. "Removal of Hydrogen Sulfide from Exhaust Air from a Viscose Staple Fiber Factory", D. C. F. Pratt and A. Rutherford. "Sulfuric Acid Plant: Tail Gas Treatment", A. Jackson and J. M. Solbett. "Dust Arrestment in the Cement Industry", E. Burke. "The Prevention of Atmospheric Pollution in the Carbon Black Industry", D. L. Allen. "The Role of the Cyclone in Reducing Atmospheric Pollution", C. J. Stairmand and R. M. Kelsey.

03120151

- 159 Incinerator Design and the Fly-Ash Problem. 3. S. A. Greeley, S. M. Clarke, and R. H. Gould. Am. City 70, 126-127 (July 1955).

At the present time, most operating incinerators rely on expansion chambers for the removal of fly ash. The tendency in the last few years has been to increase their size. Some information on the design of such chambers has been obtained by New York City from the operation of large models. Costs of plants in 11 cities are given. There is practically no experience with fly-ash removal facilities of the mechanical kind, such as cyclones, or with electrical precipitators, with one exception. In most localities, the discharges from incinerator chimneys are not large contributors to air pollution. Chambers which provide facilities for removal, such as traps, impingement walls, and water, will meet existing needs to a sufficient degree. However, the general plan should provide for more complete methods in the future, if such are ever needed. Further improvement of furnace design is needed to provide better methods of charging and stoking.

-- Cond. from authors' summary (APCA Absts.)

- 160 Air Pollution Report 1948-55. Santa Clara County Health Department, W. E. Turner, Director. 20 pp. (Aug. 1955).

Santa Clara County is at the southern end of the San Francisco bay area, and its air pollution problem is intensified by the prevailing winds which sweep pollutants into a pocket comprising most of the county, where they remain in periods of inversion. This report describes the control program which has been in effect several years, including air sampling and analysis, reduction of pollution from existing sources, and review of plans for new industry. The program is being carried out with the cooperation of industry. Air analysis reveals the presence of the common pollutants, including ozone, aldehydes, nitrogen oxides, sulfur oxides, carbon monoxide, and particulate matter, all in lower concentrations than in the Los Angeles area. Other factors in air pollution are hydrogen sulfide arising from the dumping of garbage into the bay, and insecticides from spraying. The problem will become more acute as the area is more largely industrialized, and it is hoped that control measures at this stage will prevent a repetition of the situation now existing in Los Angeles.

- 161 Range of Applicability of Catalytic Fume Burners. H. R. Suter. J. Air Pollution Control Assn. 5, 173-175, 184 (Nov. 1955).

The mechanism of catalytic oxidation in fume burners is discussed. The general field of its applicability for vapor-phase oxidation in the air-pollution control field lies in streams containing combustible matter at concentrations below the lower limit of explosibility. The only physical limitation is that the combustible material must be in the vapor phase or must be vaporizable at a reasonable temperature. The chemical limitations are: (1) that the material to be oxidized must yield innocuous products; (2) that specific catalyst poisons must be absent. The practical and economic limitations involve the cost of the catalysts, the isolation of the stream, and the concentration of the combustible substance. With intelligent treatment of the practical and technical factors involved, the application of catalytic combustion in the air pollution control field will continue to grow.

ACCIDENTS AND PREVENTION

- 162 Accidental Death Related to Industry. J. S. Felton. Ind. Med. & Surg. 24, 524-537 (Dec. 1955).

Approximately 15,000 workers die from job-connected causes each year. Rates in the United States, although low, are not the lowest. Work accidents resulting in death show a rate of 26 per 100,000 workers. Mining, quarrying, oil and gas well operations demonstrate the highest death rate, but the greatest number of people killed is in agriculture. About 2,000 workers die annually from silicosis, anthracosilicosis, and other pneumoconioses annually. Rates and statistics for Illinois, Michigan, and New York are given with breakdown by year, type of industry, type of accident, agency and action causing injury, materials causing occupational illness, occupation, age, and amount of award. Death benefits are paid in all states. Examples of workers' deaths that are

cited illustrate the fact that nearly all could have been prevented by basic safety precautions. Employers are faced periodically with death at work unrelated to the job, especially cardiac conditions. Fatalities have followed industrially sponsored recreation programs. Recommendations proposed to counteract this annual loss include: (1) increased cooperation between industrial safety directors and law enforcement officers to effect a greater awareness of safety at work; (2) investigation of accidental deaths in industry; (3) training law enforcement officers to carry out good cause analyses of on-the-job deaths; (4) institution of a system of medical examiners and of mandatory autopsies; (5) reorientation of attitudes of employer, worker, and union officials so that safety becomes a condition of employment; (6) institution of employee testing to detect the person unconsciously bent on self-destruction; (7) convincing the worker that materials handling equipment should be used in place of muscular effort; (8) institution of safety programs in all industrial activities, regardless of size; (9) analysis of death experience data in the states; (10) institution of specific programs for groups demonstrating high death rates; (11) bringing child labor laws to date and enforcing compliance with this legislation; and (12) consulting official agencies when a question of potential toxicity of work materials arises.

-- Cond. from author's summary

- 63 The Illusive Phenomena of Accident Proneness. W. B. Webb. Public Health Repts. 70, 951-956 (Oct. 1955).

The author critically discusses three statistical methods for the study of accident proneness, namely the Poisson, split-period, and external methods, and the non-statistical clinical method. He concludes that more light would be shed by understanding human behavior factors than from complicated statistical analyses of the uncontrolled world surrounding accidents in everyday circumstances.

- 64 A Clinical Study of a Group of Accident-Prone Workers. J. A. Smiley. Brit. J. Ind. Med. 12, 263-278 (Oct. 1955).

A study was made of a large number of grossly accident-prone workers in an aircraft factory, with reference to emotional and physical conditions. A large percentage of the persons who were frequently absent on account of injuries had more than the average number of absences from other causes, including vague terms like fatigue, neurasthenia and gastritis. These persons tended to have a high incidence of peptic ulceration, transient albuminuria, and excessive sweating on the palms of the hands and soles of the feet. The relation of these disturbances to disorders of the hypothalamus is extensively discussed. Most of the symptoms described are the result of a loss of balance between the sympathetic and parasympathetic systems influenced by abnormal emotional activity, and mediated by the hypothalamic region of the brain. The fact that the whole nervous system is involved in the process might account for the passivity of the accident-prone at the actual moment that the accident takes place. It might also explain the commonly held view that obsessional neurotics (whose response is more on the parasympathetic side than on the sympathetic side) tend not to have accidents. These considerations would not apply to road accidents, for instance, where intelligence seems to be a more important factor.

MISCELLANEOUS

- 65 Water Pollution Abatement Manual. Manual Sheet W-1. Organization and Method for Investigating Wastes in Relation to Water Pollution. Manufacturing Chemists' Assn. Inc. 1625 Eye St., NW, Washington, D. C. 7 pp. (Revised 1954). 25 cents.

The present manual is a revision of the first edition published in 1948. The material includes: a statement of the problem; a history of legislative action on the problem; and a program of organization for effective action, including technical problems, engineering design, and plant operation. Under the last heading are 17 steps in the development and operation of a waste disposal program. (Previously published Manual W-2, on "Insoluble and Dissolved Substances", and W-3 on "Neutralization of Acid and Alkaline Plant Effluents", are also available at 25 cents each.)

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