



Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

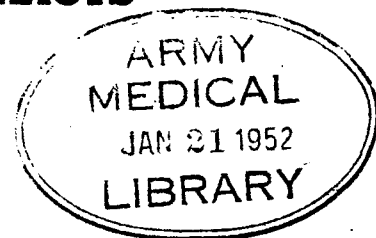
MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL . . . decisions and trends



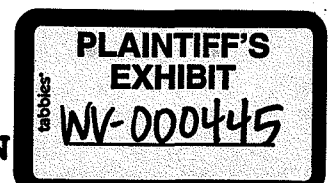
JANUARY, 1952

(Vol. 16, No. 1)

INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE -- PITTSBURGH 13, PA.





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.

Volume 14

January, 1952

No. 1

NEW ADDITIONS TO FOUNDATION MEMBERSHIP

The following new members have recently affiliated with the Foundation:

American Foundrymen's Society
Celanese Corporation of America

Lakey Foundry and Machine Company
The Refractories Institute

RADIO TALKS ON SCIENCE IN LIVING

Mellon Institute has arranged a series of six talks on "Science in Living," to be presented by members of the Institute's research staff, over WDUQ, the radio station of Duquesne University, Pittsburgh, Pa. The first talk, "Science and Health," by Dr. Walmer, Managing Director of the Foundation, has been tape recorded for broadcasting on January 13, 1952. Other subjects to be covered in the weekly series are: Science and Food, Science and the Home, Science and Resources, Science and Energy, and Science and the Future.

INDUSTRIAL HYGIENE COLUMN

The Industrial Hygiene column which the Foundation prepares bimonthly for Industrial and Engineering Chemistry, has recently had articles dealing with a cancer control program for high-boiling catalytically cracked oils, maximum allowable concentrations, arsine poisoning, and influence of dietary factors on susceptibility to toxic substances.

INDUSTRIAL HEALTH MEETINGS IN PITTSBURGH

The 4th Annual Meeting of the American Academy of Occupational Medicine is meeting in Pittsburgh on January 17-19, 1952. Dr. Henry F. Smyth, Jr., Chairman of the Foundation's Chemical-Toxicological Committee, will present a paper entitled "Toxicology and Experimental Pathology," as part of a general discussion on "The Liver as Related to Occupational Exposures." Dr. A. G. Kammer, Secretary of the Foundation's Medical Committee, will present a paper on the "Purposes and Uses of Industrial Medical Records and Reports."

The 12th Annual Congress on Industrial Health of the AMA will also meet in Pittsburgh on January 18-19, 1952. Dr. A. J. Lanza, Chairman of the Foundation's Medical Committee, and Dr. L. C. McGee, a member of the Medical Committee, will participate in the program.

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INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

1 Technical Data for Civil Defense.

The November issue of Nucleonics contains a supplement consisting of several brief papers on nucleonics personnel working for, or as consultants to, civil-defense agencies. The subjects include: fission-product decay rates; slow-neutron-induced activities; a dosage calculator; a decontamination chart showing the agents to be used for a variety of contaminated materials; and survey meters for water monitoring.

2 Public Health Journals Merge.

Beginning January, 1952, Public Health Reports, heretofore published weekly, will appear as a monthly periodical. Two other technical publications of the Public Health Service--The Journal of Venereal Disease Information and the Communicable Disease Center Bulletin--are being merged with it, broadening the scope of the publication. There will be more emphasis on administrative procedure, program development, and applied research aspects and less on bench research and clinical material not directly related to public health practice.

3 President Truman Appoints Health Survey Committee.

Paul B. Magnuson, formerly Director of the Veterans Administration, has been assigned as Chairman of a committee recently inaugurated by President Truman covering the health status of the United States. This committee is to make a survey of health conditions and controls, and make their final report at the end of a year. President Truman says, "Present world crises make it particularly important that we should seek to limit the drain of sickness and death on our strain." Mr. Magnuson will be assisted by a staff of fourteen, along with the American Medical Association, and educational and research institutions. The commission is to report on total health requirements and recommend ways of meeting them in both the immediate and distant future.

OCCUPATIONAL DISEASE STATISTICS

4 Occupational Disease Statistics

	Ind. Dec. 1951	Mich. Nov. 1951	Wisc. Oct. Nov. 1951	Total
Acute carbon monoxide poisoning	7			7
Allergy			2	2
Anthracosilicosis	1			1
Bronchial irritation			1	1
Carbon monoxide poisoning			1	1
Carbon tetrachloride poisoning			1	1
Chemical poisoning			1	1
Dermatoses	13*	7	67	87
Eczema			2	2
Eye infection			2	2
Eye irritation			3	3
Hernia		11		11
Lead poisoning			2	2
Lung irritation			1	1
Miscellaneous		3	12	15
Pneumoconiosis		6		6
Silicosis		26		26
Silico-tuberculosis			2	2
Skin infection			22	22
Skin irritation			8	8
Total	21	53	127	201

1. Occupational disease cases reported to the Board of Health.

* Gasoline, straw, streptomycin, synthetic glues, tomatoes, and wood finish caused one case each; rubber caused two cases; and five cases were caused by miscellaneous sources.

LEGAL DEVELOPMENTS

5 Aggravation of Cancer by Steel Dust Inhalation as Compensable Injury.

The petitioner filed a claim under the Workmen's Compensation Act to recover compensation for the death of her husband. From an order denying the claim, which was affirmed by the trial court, the petitioner appealed to the Supreme Court of Arkansas. The deceased worked for the Southern Lumber Company almost continuously from 1918 to 1942. In April of the latter year he went to the hospital, where he died a few weeks later. The deceased was employed as a saw filer in a poorly ventilated room in which there was much dust from sawing operations.

In the petitioner's claim, the nature of the accident was given as "inhaling steel and emery dust" and the cause of injury or death as "epitheliomateous cancer." According to the court, the law designates epitheliomateous cancer as "one caused by tar, pitch, bitumen, or mineral oil", and there was no evidence that the deceased's cancer was caused by any of those substances. However, there was no proof that emery dust, saw-filings and sawdust did not aggravate a cancer which caused the death of the deceased. Another medical witness testified that it was the emery dust that caused the cancer by constant irritation, while still a third testified that the inhalation of any irritant would aggravate a cancerous condition.

Although death did not follow until a year and a half after the onset of the cancer, its cause was still an accident in terms of the law. A disputed claim should be considered by giving the Workmen's Compensation Act a liberal interpretation in favor of the claimant. Accordingly the judgment of the trial court was reversed and the Workmen's Compensation Commission was directed to make an award in favor of the claimant. Scobey vs. Southern Lumber Company, 238 S. W. (2d) 640 (Arkansas, 1951).

Cond. from J. A. M. A., October 20, 1951

6 Forty-one States Improve Workmen's Compensation Laws.

Workmen's compensation laws were amended this year in Hawaii, Puerto Rico, and in 41 of the 44 states whose legislatures met in regular session. Twenty-eight states and Hawaii increased death benefits, and the same number increased benefits for temporary total disability. Coverage was extended in 23 states. Benefits were provided for civil-defense workers in ten states. An occupational disease act was passed in Vermont applying to listed diseases, and Maryland changed from schedule to full coverage. Pneumoconiosis was added to the coverage in Alabama,

silicosis in Maine, and radioactive diseases in Colorado. A second injury fund was created in Montana. In several states, rehabilitation services were improved, or benefits increased. A Board of Rehabilitation was established in Missouri, and a State Rehabilitation Center in Ohio.

-- Labor Inf. Bull., November, 1951

7 Legal Aspects of Corporate Medical Practice. I.H. Rubinstein.
Industrial Medicine & Surgery 20,513-519, (November, 1951).

The author discusses the question of whether it is lawful for a corporation to employ licensed physicians and surgeons. He reviews all the court cases involving that question, with particular stress on the precise elements that determined the decision of the courts. The first case concerns a corporation for profit, providing medical services, maintaining a fully equipped clinic, and advertising extensively. The decision was that the corporation was operating illegally. This ruling represents the overwhelming weight of authority in the United States, as shown by references to numerous cases.

On the other side are two decisions in which similar organizations were considered legal. Exceptions to the majority ruling include: (1) industrial corporations that maintain medical departments for their employees; (2) benevolent associations furnishing medical services to members; (3) hospitals, sanitariums, and dispensaries; (4) corporations using x-ray, electrotherapy or roentgenology; (5) cooperative health membership associations of a city, county, or Federal agency to obtain medical cares for its members. Such organizations have been decided to be legal, provided the individual doctors and other employees are duly licensed and qualified.

Another question is whether any of these types of organization are practically in the insurance business and should be subject to the regulations of that business. The consensus of decisions is that they are not, except in Ohio, where two rulings have definitely established such organizations, where for profit or not, as insurers and subject to all rules and laws applying to insurance companies. A number of states have enacted statutes recently for the regulation and supervision of group medical service plans. The only, but significant, reported case on the interpretation of such a statute is that concerning the California Physicians' Service, decided in 1946. It was decided that since service is provided, rather than indemnity, and no risk is assumed, such an organization is clearly not an insurance company.

8 Silicosis--Exposure to Silicon Dioxide--Specific Provision in State Law.

The claimant's husband contracted silicosis, from which he eventually died, as a result of constant exposure to silicon dioxide in the usual course of his employment. He was paid monthly compensation until a total of \$1100 had been paid in accordance with a section of the

law dealing specifically with cases of silicosis. The claimant in seeking additional compensation, relies on sections of the law which in fact specifically exempt silicosis from their provisions. Since it was obviously the intention of the legislature to make different provisions for cases of disability and death resulting from silicosis than for those resulting from other occupational diseases, the award made in accordance with the specific section of the law is sustained. Industrial Commission of Colorado v. Alspaugh. Colorado Supreme Court, No. 16, 715, October 1, 1951. -- CCH

9 Death Benefits--Virus Pneumonia--Miner--Pre-existing Silicosis as Contributory Cause.

Since the decedent's silicosis, contracted in a previous mining employment, did not progress during the five years in which he worked on the surface as a drill bit grinder and truck driver for the defendant mining company, the silicosis could not be termed a contributing factor to his death from virus pneumonia. And since virus pneumonia is not a compensable occupational disease, the judgment of the Board denying benefits was affirmed. Adams v. Bitco, Inc. Idaho Supreme Court, No. 7758, November 30, 1951. -- CCH

10 Death Benefits--Silicosis--Miner--Statute of Limitations.

A claim is valid only where the death alleged as a cause for compensation has occurred within the three-year period following the date of the decedent's last employment. Here, the decedent died from silicosis more than three years after his last employment, and the widow's appeal was necessarily denied. Wonderlick v. Philadelphia & Reading Coal and Iron Co., Pennsylvania Superior Court, No. 16, November 15, 1951. -- CCH

BOOKS, PAMPHLETS AND NOTICES

- 11 The Operation of Sickness Benefit Plans in Collective Bargaining.
F. Slavick. Industrial Relations Section, Dept. of Economics and Social Institutions, Princeton University, Princeton, N.J., 109 pp., (1951).
Price \$2.50.

This report, a revision and extension of one published in 1945, presents the results of a survey and analyses of a representative group of negotiated plans with respect to financial arrangements and experience, administrative procedures and problems, and adequacy of benefits

relative to needs and cost. The scope is confined primarily to sickness benefit plans established through collective bargaining, but in some cases that feature is integrated with others in particular plans. The programs have been successful; anticipated stumbling blocks encountered by earlier union plans have not materialized. The success has been due to the conscientiousness and ability of those responsible for their administration, and the generally favorable economic conditions which prevailed during the period in which the plans have operated. On the other hand, few union or employer representatives have thought through clearly their objectives with respect to the programs, and expediency rather than perfection of the plans has usually been a deciding factor.

The author also discusses the relation of union plans to Government plans, and recommends careful consideration of the respective functions.

-- FFR

- 12 Rosenau Preventive Medicine and Hygiene. Seventh Edition. K.F. Maxcy. Appleton-Century-Crofts, Inc., New York. 1462 pp., (1951).
Price \$14.00.

The first edition of this book was published in 1913. Since then it has been revised and amplified several times by Dr. Rosenau and the present author to keep pace with modern developments. A number of experts in various fields have collaborated in writing the present volume. The first section deals with the infectious diseases, bacterial and parasitic, and their means of control, including vaccination, insect and rodent control, and prevention of airborne infection. Nutrition and deficiency diseases are next considered.

The section on maintenance of health and prevention of disability deals largely with child health, but contains chapters on senescence and mental hygiene. Food sanitation is the subject of the next section. The subjects of environmental medicine and occupational diseases, by Anna M. Baetjer, are each given about 100 pages. Sanitary control of water supplies, sewage and refuse disposal, methodology, and public health organization and activities are treated in the concluding sections. To those familiar with the earlier editions, the book needs no further commendation.

-- FFR

INDUSTRIAL MEDICAL PRACTICE

- 13 Critical Survey of Manual Artificial Respiration. A.S. Gordon, M.S. Sadove, F. Raymon and A.C. Ivy. J. Am. Med. Assn. 147, 1444-1453, (December 8, 1951).

The Schafer prone pressure method of resuscitation has been widely recommended and used, primarily because of its ease of teaching and application. It has been responsible for a large number of successful

resuscitations. This paper presents an extensive and critical survey of studies of the various methods, with the conclusions that the Schafer method is the least effective for ventilating the lungs. The relative merits and disadvantages of the various methods are compared, concluding with the following recommendations: (1) as soon as it is compatible with the pedagogical factors involved, the Schafer prone pressure method of manual artificial respiration should be replaced by one of the more efficient push-pull methods; (2) of the push-pull methods, the arm lift-back pressure method, slightly modified from the original Holger Nielsen method, is preferable for general indoctrination; (3) other push-pull methods that are acceptable, and are specifically applicable in special circumstances, include the hip lift-back pressure and the Silvester (arm lift-chest pressure) methods.

- 14 Back Pressure-Arm Lift Method for Administering Artificial Respiration Recommended. American Medical Association, Council on Physical Medicine and Rehabilitation. J. Am. Med. Assn. 147, 1454-1455, (December 8, 1951).

The Council on Physical Medicine and Rehabilitation, the American National Red Cross, and many other organizations have endorsed the back pressure-lift arm method of artificial respiration for use by the general public when dealing with cases of asphyxia. The teaching and use of other selected methods may be indicated for special situations, but it is expected that the back pressure-lift arm method will supplant the prone pressure as the one most generally indicated.

This endorsement follows a recommendation released December 3 by The National American Red Cross, National Research Council, Department of Defense, and Public Health Service. The general technique is described. Although not quite as simple as the Schafer method, the recommended method is easy to learn and apply. The principal reasons for the recommendation are given briefly (see preceding abstract).

- 15 The Techniques of an Occupational Health Program--Keeping the Employee Off the Job. Robert Collier Page. Med. Bull. (Std. Oil N.J.) 11, 478-489, (October, 1951).

This paper deals with the problem of medical care of the faithful employee who does more than is expected of him and may have disorders, physical and psychological that are partly the results of excessive application and sometimes of promotion to responsibilities that are too difficult for him. Such an employee is likely to minimize his complaints and to neglect visiting the doctor. The task of the industrial physician is difficult in such cases, but periodical examinations, counseling the employee and his superiors, and constructive treatment have been successful. Three cases are cited, one with satisfactory results on

return to work, and the others leading to retirement. Earlier discovery and treatment would have ameliorated conditions in all cases. It is emphasized that constructive medicine includes preventive measures in cases like those described and in many others to assure maximum health and efficiency.

- 16 The Techniques of an Occupational Health Program--Keeping the Employee On the Job. Robert Clinton Page. Med. Bull. (Std. Oil N.J.) 11, 490-495, (October, 1951).

A major goal of an industrial medical department should be to instill the desire among employees to keep themselves physically and emotionally fit and on the job. The various functions of the industrial physician that relate directly and indirectly to that purpose are: (1) periodic physical examinations and remedial measures for any discovered result of occupational exposure; (2) first aid and other professional services; (3) clearing of absentees on return to work; (4) health education and information; (5) counseling service; (6) visiting nurse service; (7) attention to working conditions and industrial hazards; and (8) prophylactic vaccinations.

- 17 Periodic Examination for Doctors. W.B. Gordon. Pgh. Med. Bull. 40, 909-910, (November 24, 1951).

Health examinations for executives was stressed at the recent Industrial Hygiene Foundation meeting. If periodic physical examination is valuable for industrial workers and other individuals, why is it not for physicians? The death rate of physicians over 45 from arteriosclerotic and coronary disease has been proved to be higher than in the general population. The increase in deaths from leukemic disorders among radiologists has also been pointed out. The local Medical Society should take the lead in a definite organized plan for periodic examination of its members.

The benefits of such a program would include not only the prolongation of the life of physicians, but also encourage the layman to seek periodic examinations for the early detection and correction of disease.

- 18 Preparation for Industrial Nursing. Sarah Wallace. Nursing World 125, 462-464, (October, 1951).

The author discusses the scope of education for industrial nursing and the relative advantages and disadvantages of short courses in industrial nursing as compared with substitution and addition of subjects in the present public health nursing courses.

- 19 The Nurse and the Atom Bomb. Mary M. Sheehan, W.S. Edgerly, and Winifred Larson. Nursing World 125, 518-519, (November, 1951).

The nurse has an important part in preparing for the consequences of an atom bomb attack, especially in the matters of protection and first-aid. A check list of preparations include securing trained help, starting first aid classes, locating aid stations, providing emergency equipment, preparing auxiliary water and light sources and encouraging blood donations. A list of suggestions from the New York State Civilian Defense Commission, on what to do and what not to do, is included.

- 20 Rehabilitation and Resettlement in Pneumoconiosis.
I. Davies. Rehabilitation 1, 10-13, 23, (January, 1951).

In South Wales, more than 17,000 men are suffering from coalminer's pneumoconiosis, and between 2000 and 3000 men are still leaving the industry each year from this cause. Increased knowledge of the disease assures earlier diagnosis, and improved prognosis when men are removed from the dusty environment in the early stages. The program of rehabilitation and resettlement is described. It involves three stages: (1) reassurance of the patient after careful medical assessment; (2) suitable exercises and physio-therapy to improve the dyspnea; and (3) suitable employment near the patient's home. Experience in some industries especially devised or adapted for rehabilitated miners has shown that they are good workmen, with an absentee rate under 5%.

-- Cond. from Bull. Hygiene

- 21 Hematological Differentiation between Silicosis and Tuberculosis.
M. Stojadinovic. Arhiv. Hig. Rada 2, 48, (1951). (In Yugoslavian).

Benda's method of granulodiagnosis permits definite conclusions about the existence of an active tuberculous process. The method consists in identifying different kinds of polymorphonuclear neutrophils in the blood smear and in determining their percentage. The author distinguishes four types of polymorphonuclear leucocytes, which indicate absence or degree of tuberculosis. On the evidence of 78 cases, their relative counts have been found reliable in distinguishing silicosis from tuberculosis. The method is easily applied, requires a minimum of equipment, and promises to be of theoretical importance as well as practical value.

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

- 22 The Value of Lung Tomography in the Study of Silicosis. L. Roche. Brit. J. Ind. Med. 8, 236-243, (October, 1951). (In French).

The importance of tomographic studies in silicosis is described and illustrated by allusion to representative cases. It is stressed that an exact evaluation of the extent of the disease can only be made by using the three radiological aids: radiography, fluoroscopy, and tomography.

-- Author's English Summary

- 23 Oxymetry, Work Experiments, and Determination of Fitness for Work. A. Buhlmann. Schweiz. Med. Wochschr. 81, 374-376, (April 21, 1950). (In German.)

The author describes a series of experiments with a new oxymeter for determining oxygen saturation of the blood. Exercise load was measured by a bicycle ergometer fitted with automatic recording of the load in watts. Patients with emphysema, silicosis (stage 3) and chronic spastic bronchitis showed undersaturation at lower loads than healthy subjects.

In all cases the reduction of working capacity, whether produced artificially in healthy persons or by disease, was a consequence of interference in lung function; the heart and circulation had only a secondary importance. By a gradual increase of the load the limit of possible adaptation of a patient with impaired pulmonary function is defined. When the important factors are imitated in healthy persons they likewise lead to a diminished capacity for effort. The difficulty in differentiating between pulmonary and cardiac insufficiency is discussed.

-- Cond. from Bull. Hyg.

- 24 Treatment of Cyanide Poisoning in Industry. J.H. Wolfsie. Arch. Ind. Hyg. & Occ. Med. 4, 417-425, (November, 1951).

In spite of closed processes and rigid industrial hygiene controls in industry, accidents will occur with resultant cases of cyanide poisoning. Cyanide products have been handled in volume for many years at this plant. Hydrogen cyanide has been in production here for 30 years, and there have been no deaths from cyanide poisoning. Fatalities from cyanide poisoning can be prevented by education, training, and preparedness. Sodium nitrite and sodium thiosulfate, by their formation of cyanmethemoglobin and thiocyanate, respectively, are the most effective antidotes. A cyanide first-aid kit is described; a procedure for treatment is outlined, and clinical reports of typical severe cases are presented.

-- Author's Summary

SKIN DISEASES AND BURNS

- 25 Chromate Dermatitis in Railroad Employees Working with Diesel Locomotives. J.R. Winston and E.N. Walsh. J. Am. Med. Assn. 147, 1133-1134, (November 17, 1951).

Attention is called to chromate dermatitis resulting from contact with diesel locomotive radiator fluid as a hazard of growing importance in the railroad industry because of the increasing use of diesel

locomotives. A report of a case of typical chromate dermatitis resulting from contact with this fluid is presented. The factors contributing to the problem and suggestions for its solution are presented.

-- Cond. from Authors' Summary

- 26 Industrial Dermatitis Due to Manganese Treated with BAL.
C. Ceresa. Med. Lavoro 42, 26, (January, 1951). (In Italian).

A papuloerythematous dermatitis is described, which occurred in a worker, aged 31, after two months' work in breaking up and loading manganese ore. The cutaneous disease was accompanied by acute bronchitis and pronounced disturbances of the liver, with enlargement of this organ and an intensely positive Takata reaction. The injection of BAL in oil (2,3-dimercaptopropanol injection U.S.P. (200 mg. of 2,3-dimercaptopropanol a day) during 14 days produced, after a transitory aggravation of the symptoms in the first days, a rapid resolution of the dermatitis and bronchitis and at the same time a reduction of the hepatic disturbances. The beneficial effects of BAL confirmed the diagnosis of manganese poisoning. The urinary elimination of the manganese was checked semiquantitatively before and during the treatment by a method which is described in detail; an increase of the amount of the metal eliminated with urine was observed as a consequence of the administration of BAL.

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

- 27 The Effect of ACTH and Cortisone on the Skin and on Skin Diseases.
H. Blank. Penna. Med. J. 54, 1062-1065, (November, 1951).

On the basis of the available literature the author has compiled a list of skin diseases with the effect of ACTH and cortisone on each. It is clearly indicated and emphasized that neither remedy can be used indiscriminately for treatment of skin diseases. Some diseases are made worse, and sometimes the drugs have injurious effects. Severe allergic urticaria and severe contact dermatitis are listed among the cases where ACTH or cortisone may be indicated, but it is emphasized that the cause of those affections must be found and removed.

- 28 Crushed Ice Packing in Treatment of Burns.
S. E. Flynn. Calif. Med. 75, 97, (August, 1951).

Application of packs of crushed ice in the treatment of patients with severe burns was instituted as an emergency measure aboard a Navy vessel when 50 patients had been severely burned and standard methods had been taken to overcome shock, relieve pain, and prevent dehydration, but materials on hand were exhausted. Shock and pain were immediately relieved, and after-effects were minimized. Crushed ice was superior to

to morphine sulfate in relieving the pain of burns. The author feels that crushed ice packing should be considered in atomic bomb attacks when available physicians, using standard methods, could not cope with the problem.

-- Cond. from J. A. M. A.

- 29 New Technique for Local Treatment of Burns. R. M. Curtis, J. H. Brewer, and I. W. Rose. J. Am. Med. Assn. 147, 741-743, (October 20, 1951).

A new method for the treatment of burns and wounds is suggested. It is comprised of application of a partially hydrolyzed casein gel to the burned area and then covering it with gauze impregnated with zinc acetate. The gel is allowed to set, forming a semipermeable membrane which prevents the superficial protein loss, and, by the support given the damaged capillary bed, diminishes the protein loss into the burned area, thus minimizing local cellular damage and shock. Results are relief of pain, a minimum of infection, and a splinting of the injured part. This method of treatment permits early grafting by allowing the body's own enzymatic and phagocytic systems to debride the area of deep burn. The described method is simple and easy to apply and can be used by untrained personnel.

-- Authors' Summary

CHEMICAL HAZARDS

- 30 Delayed Cardiac Injury Following Carbon Monoxide Poisoning. K. F. Holm. Med. Klin. 45, 1427, 1429, (Nov. 10, 1950). (In German).

The author describes a case in which dyspnea on exertion first occurred six months after severe gas poisoning. Eighteen months later the patient was bedridden, with severe dyspnea, dilatation of the heart, systolic murmurs, anasarca and enlarged liver; residual serum nitrogen 33-4 mgm. per cent; albuminuria 0.6-1.8 per 1,000. Death from cardiac failure occurred nearly 2 years after the original poisoning.

Post mortem examination showed hypertrophy and dilatation of the heart with diffuse myocardial fibrosis and fatty degeneration; acute congestion of lungs, spleen, and gastro-intestinal canal; hemorrhagic infarcts of both lungs; moderate arterio-sclerosis and atheroma of the aorta. The author regards the diffuse myocardial fibrosis of the heart as a delayed injury caused by carbon monoxide poisoning.

His view of the pathogenesis of the lesions is that the hypoxemia occurring during the gas poisoning is a predisposing factor for an intensive direct toxic action of carbon monoxide on the parenchymal circulatory tissue.

-- Bull. Hyg.

- 31 Clinical Observations on the Toxicology of Boron Hydrides.
H.M. Rozendaal. Arch. Ind. Hyg. & Occ. Med. 4, 257-260,
(September, 1951).

Cases in which individuals were exposed to boron hydrides are described. A syndrome resembling "metal fume fever" has been observed following exposure to diborane, and a clinical picture indicative of marked irritation of the central nervous system appears to follow penta-borane exposures. In one case it was possible to demonstrate a considerable increase in the boron content of the blood during the acute illness. No satisfactory explanation of the mode of action of these compounds can be given at present, and no specific form of treatment is available. Awareness of this hazard should prevent, through adequate ventilation and proper monitoring, additional exposures.

-- Author's Summary

- 32 Liquid Oxygen. Data Sheet D-Chem. 50. National Safety News 64,
40, 42, 112-114, (December, 1951). Reprints available from National
Safety Council.

Liquid air should be called medium purity liquid oxygen, since its properties dictate the same care in handling as is used with high purity liquid oxygen. Most of the considerations given in this pamphlet apply to both. Large amounts are shipped as liquid in specially designed and insulated containers, which should always be vented or provided with relief valves. The hazards arise from the enormously increased capacity to support combustion. Contact with organic materials is always dangerous. Disagreeable burns may result from liquid oxygen in contact with the skin for more than a few seconds. The physical properties of many materials are altered when cooled to the temperature of liquid oxygen, and contact with materials at room temperature leads to a violent evolution of gas. These hazards require a variety of precautions, which are set forth. It is emphasized that all handling of liquid oxygen must be done under the supervision of responsible persons who are thoroughly familiar with its hazards.

- 33 Some Unusual Aspects of Arsine Poisoning. P. Moureau, E. Ponsart,
and J. Warin. Arch. Belges Med. Sociale, Hyg. Med. Travail et Med.
Legale 9, 31-36, (January, 1951). (In French).

Two men contracted arsine poisoning while discharging and washing zinc ashes, a by-product of the galvanizing process. Before galvanizing, iron wire is cleaned in a bath of sulfuric acid to which arsenic is added as an "acid economizer." The film of arsenic on the wire remains through the galvanizing process, and arsenic is present in the zinc ash. Arsine is then liberated on contact with water. A few hours

after exposure, both men became seriously ill with pronounced jaundice and kidney disturbance. On the fifth day one developed pulmonary edema with enlarged heart and liver, and died a day later.

Fatty degeneration of the heart and liver was evident, and the kidney tubules were blocked by albuminous debris. Arsenic was found in the viscera, especially in the liver and urine. The other patient made a spectacular recovery through treatment with BAL, administered by three injections of 0.2 gram in 24 hours. After 3 days all arsenic had been discharged from the system.

The recommendation is made that no "acid economizer" should be used in the future and that workers in other places where zinc ashes are used should be warned of the possible danger. -- Cond. from Bull. Hyg.

- 34 A Case of Fatal Acute Arsine Poisoning. I. Mohacek and Z. Stajduhar. Arhiv Hig. Rada 2, 174, (1951). (In Yugoslavian).

A case is described of fatal acute arsine poisoning brought about by unskilled handling of arsine during disinfection. A few hours after poisoning severe anemia was diagnosed (the erythrocyte count was 2,840,000). The erythrocytes in the chamber could hardly be counted because they decomposed readily. The patient was anuric and died on the third day after the poisoning. The postmortem examination revealed degenerative changes in the liver, spleen, heart, and kidney, as well as a widespread edema of the lung. Several organs contained considerable quantities of arsenic. Spectroscopic and spectrophotometric analyses for methemoglobin were carried out, and its presence in large quantities was proved beyond doubt. Cond. from Arch. Ind. Hyg. & Occ. Med.

- 35 Acute Arsine Poisoning with Anuria, and Means for Its Prevention. J. Firket. Arch. Belges Med. Sociale et Hyg. 9, 23-30, (January, 1951). (In French).

Arsine may be present whenever arsenic, often occurring as an adulterant, comes in contact with nascent hydrogen. If the exposure is heavy, death may occur in 3/4 hour from cardiovascular collapse. With less intense exposure headache, gastric and lumbar pains, fatigue, nausea and vertigo develop in 3 or 4 hours. As the gas is nonirritating and odorless its presence may be unrecognized. In proportion to the severity of the poisoning the urine becomes scanty, passing on to anuria, which is due to blocking of the kidney tubules by dead cells. The urine is dark owing to the presence of hemoglobin.

If the acute stage is survived, a period of scanty urine may follow with several weeks of serious anemia, while the patient may present a marked bronze tint. Case findings of five patients, two fatal, are presented. When a diagnosis of arsine poisoning has been made, prompt treatment with BAL must be applied. Wherever poisoning is possible, BAL should be kept on hand and its method of administration should be well understood.

-- Cond. from Bull. Hyg.

- 36 The Character and Distribution of Disease in American Industries Using Beryllium Compounds. Harriet L. Hardy. *Proc. Roy. Soc. Med.* 44, 257-262, (March, 1951).

The pathology of acute and chronic beryllium poisoning is described. The author suggests a hypothesis, based on the reported data, that beryllium is stored in the body harmlessly if taken in slowly; with changes such as pregnancy or infection, the beryllium is mobilized and becomes pathogenic. The cases of beryllium poisoning in the United States, totaling over 500, are tabulated according to industry. The author's present view is that beryllium poisoning is a systemic disease rather than an exclusive pulmonary response.

Apparently beryllium has a direct toxic effect on certain basic enzyme systems. It causes a diffuse cellular infiltration in many tissues, which usually goes on to partial granulomatous formation and later irreversible fibrous replacement of functioning tissue, with resultant clinical illness, great disability in most cases, and frequently death.

-- Cond. from Bull. Hyg.

- 37 Beryllium Excretion in Humans. F.W. Klemperer, A.P. Martin and J. Van Riper. *Arch. Ind. Hyg. & Occ. Med.* 4, 251-256, (Sept., 1951).

The urinary excretion of beryllium of patients with pulmonary granulomatosis as well as of healthy workers in the beryllium industry, and of unexposed individuals was determined. Beryllium was not detected in the urine of 35 persons who had not had occupational exposure to beryllium. Of 20 patients with chronic pulmonary granulomatosis, only twelve excreted detectable amounts of beryllium. Their daily excretion was found to be nearly constant during the experimental period. Beryllium was detected in the urine up to 10 years after cessation of exposure.

In the urine of healthy beryllium workers, the amount of beryllium was comparable to that found in the urine of patients with pulmonary granulomatosis who had worked in similar industries. The excretion of beryllium appears to depend on the solubility of the inhaled material. The highest excretions were found in persons exposed to soluble beryllium. The diagnostic significance of urinary beryllium determinations and their value as a quantitative index of industrial exposure have been discussed.

-- Authors' Summary

- 38 An Environmental Study of the Chromate Industry. M. Buckell and D.G. Harvey. *Brit. J. Ind. Med.* 8, 298-301, (October, 1951).

A survey has been made of the contamination of the atmosphere by soluble and insoluble chromium compounds in the three factories in Great Britain making basic chromates from the ore, chromite. The results are compared with those obtained in a similar survey in the United States of America. The maximum concentrations of both soluble and insoluble forms

of chromium in the atmospheres of factories in Great Britain are greater than those found in the factory in the United States of America, and the minimum concentrations are lower. The main point of similarity is the very high ratio of trivalent to hexavalent chromium in the ore mixing stage.

-- Authors' Summary

- 39 Carcinoma of the Lung in Chromate Workers. P.L. Bidstrup.
Brit. J. Ind. Med. 8, 302-305, (October, 1951).

In a survey of 724 workmen out of the 765 employed in the chromate industry in Great Britain, involving mass radiography and clinical studies, one case of pulmonary carcinoma was found. Comparison of this rate with that of the general population does not make it possible to assess the true incidence of carcinoma among chromate workers in Great Britain, but the results suggest that the crude death rate is unlikely to be as great as 25 times the normal. Examination of the same workers will continue.

-- Cond. from Author's Summary

- 40 Reduction of Dust and Mist in a Chromate Plant. H.G. Bourne, Jr.,
P.M. Frazier, and H.T. Yee. Ind. Med. & Surg. 20, 498-500,
(November, 1951).

A major reduction in air-borne chromium concentration and occupational exposure has occurred in a plant manufacturing sodium bichromate from chromite ore through the application of industrial hygiene engineering methods. Concentrations are compared before and after controls were adopted and the changes which contributed to a more healthful working environment are described. Improved housekeeping, maintenance, and worker health education should receive more emphasis in the plant health program.

-- Authors' Summary

- 41 Effect of Chromates on the Teeth. A Comparative Report.
C.A. Resch. Cleveland Clin. Quart. 17, 317-333, (1950).

From this study of 100 workers in a chromate factory one cannot state that the added hazard of working conditions had increased the incidence of dental caries, sepsis or other oral manifestations. Persons who were inclined to have teeth removed, rather than repaired, actually had a lower incidence of dental caries and sepsis than a comparative group of clinic patients. In the latter group, who were disposed to have teeth repaired there appeared to be an unduly high incidence of dental sepsis.

-- Biol. Absts.

- 42 The Effects of BAL on the Metabolism of Lead and on the Symptomatology in Lead Intoxication. E.C. Vigliani and N. Zurlo. Brit. J. Ind. Med. 8, 218-225, (October, 1951).

Twenty-seven patients suffering from industrial lead intoxication were treated with injections of BAL. The metabolism of lead was studied after a single injection of BAL in doses of 1 to 4 mg. per kg., and in the course of treatment lasting for several days with daily doses of 1 to 7 mg. per kg. A rapid fall in the blood lead level and a great increase in urinary lead followed the injection. These effects continued for the first few days on repeated injections, but in the following days they became progressively less. After cessation of treatment, those levels tended to return to the initial values.

BAL has shown itself to be a rather dangerous medicament in lead poisoning; its administration during lead colic may aggravate the abdominal symptoms and make them reappear, and even bring about acute encephalopathy. Small doses a week after colic has ceased are usually well tolerated and may accelerate recovery. The principal pharmacological effect of BAL consists in a transposition of lead from the blood and certain tissues toward other tissues, including the nervous tissue. The value of the deleading effect of BAL is relatively small when the unfavorable effects due to disturbance in the internal distribution of lead are considered.

-- Cond. from Authors' Summary

- 43 Hematological Investigation on Workers Exposed to Mercury Vapor. B. Kesic and V. Haeusler. Ind. Med. & Surg. 20, 485-488, (Nov., 1951).

Conflicting views on the effects of mercury on blood have been presented in the literature. Twenty papers are cited with quotations. The authors investigated the blood conditions of workers in the mercury mines of Idria and in a felt hat factory. The survey included 259 workers exposed to mercury vapor, of whom 118 had definite evidence of mercury poisoning, and 466 non-exposed persons as controls. No significant differences between the groups were found in erythrocyte count or in white blood picture. There were larger and more irregular differences in hemoglobin content, but an additional study showed unexplained differences in other groups of nonexposed persons. The investigations will be continued.

- 44 An Appliance for the Prevention of Mercury Poisoning. F. Stocker. Brit. J. Ind. Med. 8, 271-274, (October, 1951).

This paper describes an appliance for collecting spilled mercury, used successfully for many years by makers of electrical instruments. A large basin of water is let into the floor beneath the working point and covered by an iron grill. Scattered mercury falls into the basin. The water is siphoned off through a plug in the center of the gutter in which

the mercury collects. The mercury is then easily removed and purified for further use. Full details are given in a drawing and several illustrations.

- 45 Wetting Agents and Industrial Medicine. S. Tara.
Arch. Maladies Profess. 11, 381-384, (1950). (In French).

The increasing use of wetting agents in industry and in the home gives rise to problems that call for study. Chemically, they are sulfonated derivatives of long chain alcohols. Numerous cases of dermatitis have occurred in dishwashers using detergents containing these wetting agents. The question of inhalation of aerosols containing wetting agents has also arisen. The authors propose to investigate their toxicity. One of these substances, mixed with blood in a test tube, was found to cause rapid hemolysis and disintegration of leucocytes. -- Cond. from Bull. Hyg.

- 46 Pulmonary Toxicity of Wetting Agents Dispersed as Aerosols.
G.C. Hall, Jr. Am. J. Dis. Children 80, 408-412, (Sept., 1950).

Experiments in which guinea pigs inhaled aerosols containing certain wetting agents are described. With exposure of 8 hours daily for six days, the animals showed mild dyspnea from a 0.5% solution of each of the wetting agents, and 1% was fatal in 4 out of 6 animals. Marked fibrosis and tissue destruction were seen. A concentration of 0.1% appears to be safe, but should not be exceeded in experimental investigations in man. The wetting agents were: Duponol C (sodium lauryl sulfate); Aerosol OS (alkylaryl sulfonate), Tergitol 08 (synthetic primary alcohol sulfate), and Aerosol MA (sulfonated ester of dicarboxylic acid.) -- Cond. from Bull. Hyg.

- 47 Clinical Experiences with Exposures to Ethylene Amines.
C.U. Dernehl. Ind. Med. & Surg. 20, 541-546, (December, 1951).

Fourteen cases of dermatitis, three of burns, one of chronic recurrent headache, and three of asthma are reported and discussed, with the following conclusions: ethylene amines can be an important causative agent of industrial dermatitis; the evidence suggests that both irritative and allergic phenomena are active; prompt removal of the chemicals is an effective protective measure as shown by the fact that nine men continued to work at the amines unit without major difficulty; in most instances normal healing response can be expected after thermal burns with liquid ethylene amines; ethylene amines can have an allergenic effect upon the respiratory tract of susceptible individuals; one case of headache precipitated by exposure to amines vapors may have been due to individual sensitivity to this material. -- Author's Conclusions

- 48 Vapor Toxicity of Ethylene Dichloride Determined by Experiments on Laboratory Animals. H.C. Spencer, V.K. Rowe, E.M. Adams, D.D. McCollister, and D.D. Irish. Arch. Ind. Hyg. & Occ. Med. 4, 482-493, (November, 1951).

In single exposure experiments, rats were exposed to ethylene dichloride vapor on a varying concentration-time basis. No adverse effect was produced in 0.1 hour at 12,000 ppm or in 1.5 hour at 1000 ppm. The LD₅₀ effects were 0.5 hour and 7.2 hours at the same respective concentrations. In the long exposures, the maximum vapor concentrations for 7 hours daily, 5 days a week without adverse effects in six months were: rabbit, 400 ppm; rat, 200 ppm; monkey and guinea pig, 100 ppm. The toxic effect from single exposures consisted of depression of the central nervous system, lung irritation, and organic injury of the liver, the kidneys and the adrenal glands. The significant chronic effects seem to be hepatic and renal damage. It is concluded that for uniform daily exposures of about seven hours' duration there is little probability of any adverse effect on human subjects if the ethylene dichloride concentrations are kept below 100 ppm. -- Cond. from Authors' Summary

- 49 Symptoms Resulting from Trichloroethylene Poisoning. V. P. Giuffre. Rass. Med. Ind. 20, 198-202, (1951).

The toxic effects from the use of trichloroethylene as a solvent in dry cleaning and in defatting animal skins were observed. In one case a temporary sexual impotency occurred and in another case a continuous fever accompanied by vertigo and photophobia. As a counteracting measure to these symptoms phospholipides were administered parenterally in order to counteract the toxic effect on the nervous system. The toxic effects in these two cases were probably caused by the neurotropic action of trichloroethylene. -- Chem. Absts.

- 50 Occupational Poisoning by Trichloroethylene. S. Forssman. Arhiv. Hig. Rada 1, 257, (1950). (In English).

The pathology of acute and chronic trichloroethylene poisoning is discussed. A part of the trichloroethylene absorbed is excreted as trichloroacetic acid, and so its urinary concentration seems to be a valuable indication of the degree of exposure. When the excretion is less than 20 mg. of the acid per liter of urine, no definite effects of trichloroethylene are indicated, but above that concentration there is definite correlation between exposure and excretion. With excretion of 100 mg. per liter, trichloroethylene effects are very common. In cases with over 20 mg. per liter, the symptoms may be of such intensity that sick leave may be necessary. Preventive measures are described.

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

- 51 Chronic Trichloroethylene Poisoning. V. Lachnit and W. Rankl.
Z. Unfallmed. Berufskrankh. 43, 334-341, (December 15, 1950).
(In German).

The chronic effects of exposure to trichloroethylene are more important than the less frequent acute effects. The effects vary greatly among individuals, and the study is handicapped by the lack of a simple routine quantitative method for testing for trichloroethylene or its decomposition products in blood or urine. Neurological examination is important; psychic symptoms of a pre-narcotic effect and reactions of the sympathetic system have often occurred. A number of symptoms are mentioned, including headache, giddiness, signs of slight neuritis, variations of euphoria, and intolerance to alcohol.

Many workers give a history of sleeping unusually well after exposure, but poorly at week-ends. Workers showing this symptom should be removed from exposure. No significant changes in the blood cells or bone marrow were found in the patients examined, but estimation of serum bilirubin and of galactose, and Weltmann, cadmium, and thymol tests showed pathological deficiency. Slight impairment of liver function becomes apparent in conditions such as alcoholism, infectious disease, undernourishment, and administration of sulfonamides and many other drugs. Supervision is necessary where the open use of trichloroethylene cannot be prohibited. Neurological symptoms and signs of liver damage must be watched for.-- Cond. from Bull. Hyg.

- 52 Vapor Toxicity of Trichloroethylene Determined by Experiments on Laboratory Animals. E. M. Adams, H. C. Spencer, V. K. Rowe, D. D. McCollister, and D. D. Irish. Arch. Ind. Hyg. & Occ. Med. 4, 469-481, (November, 1951).

In the study of the effects of single exposures, groups of rats were exposed to trichloroethylene vapor on a varying time-concentration basis. The most severe single exposure with no adverse effect varied from 0.3 hour at 20,000 ppm to 5 hours at 3,000 ppm. When survival was taken as the criterion, the permissible exposures were slightly higher. The only toxic effect of importance following single exposure was a depressant action on the central nervous system (anesthetic action).

The capacity to cause organic injury was of minor importance even on repeated exposures. In the long-range experiments, animals were exposed 7 hours daily, 5 days a week, to trichloroethylene vapor for about 6 months. Maximum concentrations without adverse effect were as follows: monkey, 400 ppm; rat and rabbit, 200 ppm; guinea pig, 100 ppm. It is concluded that for uniform daily exposures of about seven hours' duration there is little probability of any adverse effects on human subjects if trichloroethylene concentrations are kept below 200 ppm; the probability of any effect whatsoever is extremely small if concentrations are kept below 100 ppm.

-- Cond. from Authors' Summary

- 53 Methyl Bromide Fumigation and Control in the Date-Packing Industry. F.R. Ingram. Arch. Ind. Hyg. & Occ. Med. 4, 193-198, (Sept., 1951).

About 200 cases of methyl bromide poisoning occurred in the Southern California date industry in the last six months of 1944, mostly in November and December. The symptoms included gastrointestinal disturbance with loss of appetite, headache and dizziness, and in the more acute cases, loss of balance and mental aberrations.

Surveys of 40 plants, with fuller investigations in eight, revealed that little was known about the hazard and no attempts were made to remove the gas before employees removed the dates from the fumigation chambers; methyl bromide concentrations up to 100 ppm were found in the general workroom air and to over 1000 ppm at the breathing zone of the workers entering the chamber. Cooperation was obtained after a mass meeting of the growers and packers at which the hazards of methyl bromide were explained and the emergency nature of the problem was presented. Safe equipment was designed by the engineering section of the Bureau of Adult Health after much study and experimentation, and plans for first-aid programs and daily illness records were presented by the nursing service. Several plants now have registered nursing services. Since the institution of the recommended control measures and the distribution of the recommendations for safe-practice procedures, there have been only scattered reports of methyl bromide poisoning, and these, on investigation, have proved to be due to a breakdown of the human element.

- 54 Keratitis among Spinners of Viscose. R. Masure. Arch. Belges Med. Sociale et Hyg. 8, 405-418, (July, 1950). (In French).

Keratitis is prevalent among spinners of viscose; 3,600 cases occurred in France in 1943, and 900 in Belgium in 1948. It is seldom severe, but causes considerable loss of working time. The symptoms include conjunctiva, pain, twitching of the lids, photophobia, lachrymation, and blurred vision. Animal experiments do not identify any single substance as the cause; evidently it is produced by a combination of fumes and gases. Eye washes and adrenaline give only temporary relief. Prevention by controlling all the products emanating from the spinning bath is the only remedy. Enclosure of the apparatus has greatly improved conditions in plants where keratitis was common. -- Cond. from Bull. Hyg.

- 55 Recovery after Poisoning with Dinitro-Orthocresol. A.B. Pollard and J.F. Filbee. Lancet 261, 618-619, (October 6, 1951.)

Since dinitro-orthocresol was introduced as a crop spray in 1940, it has caused several deaths both at manufacturing works and among farm workers; in Great Britain nine have died from this cause since 1945. The

case reported concerns a spray worker who had used D.N.O.C. for five weeks. Symptoms are given in detail. The interesting points were the high basal metabolic rate levels, the high nitrogen excretion, and the raised blood urea. The D.N.O.C. blood level at first was dangerously near the fatal point (60 micrograms per g.). Treatment consisted of sedation, replacement of fluid and electrolytes, and reduction of temperature, followed by a high-calorie diet. Recovery followed.

All people exposed to D.N.O.C. should have regular blood examinations, and should avoid using the chemical for several weeks if their blood D.N.O.C. concentration rises above 20 micrograms per g. Operators should be warned of the dangers involved and instructed how to protect themselves, and should be made to report at the first symptoms of poisoning. Particular care should be taken during hot weather.

- 56 Some Observations on the Toxic Properties of 3:5 Dinitro-Ortho-Cresol.
V.H. Parker, J.M. Barnes and F.A. Denz. Brit. J. Ind. Med. 8,
226-235, (October, 1951).

The L.D. 50 for rats and mice was found to be 24.6 mg. D.N.O.C. (3:5 dinitro-ortho-cresol) per kg. by subcutaneous injection, and was nearly the same for other animals. A single dose approximating to a lethal dose produces an acute reaction lasting a few hours. Repetition of the same dose at 24 hour intervals does not produce chronic poisoning, cumulative effects, or tolerance. Blood and tissue levels of D.N.O.C. after injection are tabulated. The effects of alcohol and environmental temperature on the susceptibility of rats have been examined. Small changes of environmental temperature may affect the mortality from a dose of D.N.O.C. that is slightly below lethal at ordinary temperatures.

- 57 Carcinogenic Hydrocarbons and Related Compounds in Processed Rubber.
H.L. Falk, P.E. Steiner, S. Goldfein, A. Breslow and Ruth Hykes.
Cancer Res. 11, 318-324, (1951).

Benzene extracts of rubber stoppers induced papillomas and carcinomas when painted on the skins of mice. Similar extracts made from rubber stoppers and an automobile tire contained known carcinogenic compounds. The possible importance of these observations to industrial hygiene, public health, and cancer research are discussed, without definite conclusions. -- Cond. from Chem. Absts.

- 58 Response of Rodents to Repeated Inhalation of Vapors of Tetraethyl Ortho-silicate. U.C. Pozzani and C.P. Carpenter. Arch. Ind. Hyg. & Occ. Med. 4, 465-468, (November, 1951).

Repeated exposure of 15 male and 15 female rats to an approximate concentration of 400 ppm of ethyl silicate for seven hours a day for 30 days resulted in significant mortality and kidney, liver, and lung damage in the

survivors. Mean weight gain and liver and kidney weights were also statistically significantly affected. Similarly, groups of rats, guinea pigs, and mice were exposed to 88, 50, and 23 ppm of ethyl silicate vapor seven hours a day five days a week for 90 days. The only statistically significant difference from the controls was a decrease in the kidney weights of the mice exposed at the 88-ppm level. On the basis of the evidence cited above, there seems to be no justification for recommending any change in the figure of 100 ppm that has been suggested as the hygienic standard for ethyl silicate.

-- Authors' Summary

- 59 Fluoroacetate Poisoning. A Review and Report of a Case. D.C. Gajdusek and Gertrude Luther. Am. J. Dis. Children 79, 310-320, (Feb., 1950).

Sodium fluoracetate, known as 1080, is a potent rodenticide. A negro boy, aged 2, licked the stopper of a bottle of the poison, on which were crystals. He soon became ill and suffered tonic convulsions for two days. A hundred hours after taking the poison he became conscious, and he was discharged as well on the eleventh day. Constant intravenous infusions of isotonic sodium chloride were administered. The clinical picture closely resembled that seen in animal experiments, a review of which is given.

-- Cond. from Bull. Hyg.

- 60 Intoxication with Furfural. B. Bugyi and J. Lepold. Nepegeszsegugy 30, 229-230, 1949. (In Hungarian.)

Twelve workers showed numbness of the tongue and the mucous membrane of the mouth, absence of taste sense, and difficulties in breathing in a plant where furfural was made with unsatisfactory ventilation. The toxicity of furfural is lower than that of benzene.

-- Chem. Absts.

- 61 The Toxicity of Some Related Halogenated Derivatives of Phenol. E.F. Stohlman. Pub. Health Repts. 66, 1303-1312, (Oct. 12, 1951).

The systemic symptoms produced by toxic doses of pentachlorophenol were increased respiratory rate and amplitude, muscular weakness and collapse. In general, this syndrome was also produced by all the other related derivatives of phenol reported here except pentabromophenol. Pentabromophenol, in addition to the above symptoms, produced generalized tremors and occasional intermittent convulsions. In many respects the symptoms resembled those of DDT poisoning in the rat.

The acute toxicities of these compounds ranged in the following descending order: Santobrite, pentachlorophenol, pentabromophenol, the copper salt of pentachlorophenol, 2,4,6-tribromophenol, and 2,4,6-triiodophenol. Relatively no cumulative toxicity was produced by five consecutive daily doses of the first three compounds, but moderate cumulative effects were produced by the last three compounds under the

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same conditions. Gross post-mortem findings were hemorrhages and congestion of the lungs, produced to a greater or lesser degree by all the compounds. Large doses of 2,4,6-triiodophenol produced severe inflammation, corrosion, and hemorrhages of the mucous membrane of the stomach. These were also produced to a lesser extent by 2,4,6-tribromophenol.

-- Author's Summary

- 62 Toxic Effects of Technical Benzene Hexachloride and Its Principal Isomers. Report of Council on Pharmacy and Chemistry. Committee on Pesticides, J. Am. Med. Assn. 147, 571-574, (October 6, 1951).

Hexachlorocyclohexane, incorrectly but generally known as benzene hexachloride, is one of the newer insecticides. The commercial product, widely known as lindane, is a mixture of at least five isomers, of which the gamma form is of the greatest entomologic and medical interest. This report deals both with the commercial product and the pure isomers, with thorough discussion of their pharmacological action, metabolism, oral, cutaneous, and inhalation toxicity, pathology, symptoms, treatment, precautions in use, and clinical experience.

It is pointed out that much information is still lacking, particularly about metabolism. The order of toxicity is about the same as that of DDT. Diagnosis should be based mainly on a history of exposure. There is no specific antidote, and treatment should be directed toward removal from the alimentary system, relief of the nervous systems, and use of a fat-free diet. Precautions against exposure are the same as for similar toxic materials. Clinical reports of human poisoning have been infrequent in the United States. The cases that have occurred are discussed briefly. The one unquestioned fatal case (in Germany) was due to ingestion of a relatively large amount. A number of cases of dermatitis were reported in Argentina. They ceased when prophylactic measures were adopted.

- 63 Toxicity of an Imidazoline (or Glyoxalidine) Fungicide. C.P. Carpenter, Carrol S. Weil and H.F. Smyth, Jr. Arch. Ind. Hyg. & Occ. Med. 4, 494-503, (November, 1951).

The conclusions of this study are that guinea pigs can tolerate a daily intake of 2-heptadecyl-imidazoline to the extent of at least 450 ppm, rats 270 ppm and dogs 210 ppm of their entire dry diet. Evidence presented before the Federal Security Agency in 1950 indicates that the average imidazoline residue on cherries and unpeeled apples at harvest after spraying with the two commercial fungicides containing imidazoline derivatives is less than 1 ppm. Therefore, considering also that fruits constitute a relatively small part of the human dietary, it is obvious that a wide margin of safety exists between residue levels and the safe level of intake inferred from these animal experiments.

-- Cond. from Authors' Conclusions

- 64 Parathion Poisoning in Florida Citrus Spray Operations. J.W. Williams and J.T. Griffiths, Jr. *J. Florida Med. Assn.* 37, 707, (May, 1951).

The parathion sprayed on citrus trees presents a new and important industrial health hazard to the Florida citrus industry. During the 1950 spray season over 1000 tons of 15% wettable parathion were used, and 50 cases of supposed parathion poisoning were reported. The method of diagnosis by determining cholinesterase in the blood plasma and red cells is discussed. A study of five cases indicates that some of the earlier suppositions about the relation of cholinesterase content to poisoning were erroneous.

In four cases symptoms of poisoning occurred when red blood cell cholinesterase was between 50 and 75% of the normal control. This finding suggested that some persons will have warning symptoms before blood cholinesterase levels are seriously reduced. In two of these cases low hemoglobin was encountered; in one there was a history of a liver disorder. In two cases the recovery of red blood cell cholinesterase was slow. These discrepancies may indicate predisposed susceptibility to parathion. They suggest that preemployment examinations including blood protein tests and cholinesterase and hemoglobin determinations may eliminate some persons who would readily become parathion poisoning casualties.

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

- 65 Labor Hygiene in Agriculture in Work with Benzene Hexachloride. S.M. Bogushevskii and E.N. Burkatskaya. *Gigiena i Sanit.* No. 4, 30-34, (1951). (In Russian).

While the mode of application of BHC greatly affects its distribution in the air (manual or mechanized methods were examined), the properly run mechanized method is most satisfactory, giving average values about 1.3 mg. per cu. m., while manual dispersion may give as much as 388 mg. per cu.m. Under favorable conditions the 12% dust irritates the mucous membranes and causes more or less serious symptoms: headaches, nausea, lowered hemoglobin, leucopenia, and increased rate of erythrocyte sedimentation. Thus the statements that BHC is harmless to warm-blooded organisms are erroneous.

-- Chem. Absts.

- 66 Pharmacologic and Toxicologic Aspects of DDT (Chlorophenothane U.S.P.). Report from the Committee on Pesticides to the Council on Pharmacy and Chemistry. *J. Am. Med. Assn.* 145, 728-733, (March 10, 1951).

This report presents a comprehensive summary of the available knowledge of the properties of DDT, the methods of its use, and the prevention and treatment of poisoning. Reported cases of DDT poisoning are summarized. The majority of these cases have followed accidental or intentional ingestion of DDT as a powder or its solution. It is pointed out that it may be impossible to decide whether the DDT or the solvent used is responsible for the symptoms. The question of chronic poisoning

from accumulation of DDT in the tissues is discussed. Precautions for safe handling of materials containing DDT are described in detail.

- 67 Toxicology of Two Butoxypolypropylene Glycol Fly Repellents.
C.P. Carpenter, Frances H. Critchfield, J.H. Nair III, and C.B. Shaffer.
Arch. Ind. Hyg. & Occ. Med. 4, 261-269, (September, 1951).

Two butoxypolypropylene glycols, BPG 400 and BPG 800 were studied. (The figures denote the approximate molecular weights). Both are proposed as fly repellents on livestock. Among the findings in animal experiments are: slight to moderate oral toxicity, no skin penetration hazard, very slight skin irritation, no eye irritation, and no storage in bodies. BPG 400 had the greatest effect when there was any physiological action. BPG 800 does not produce primary irritation of skin or cutaneous sensitization in human subjects. Results are given in detail.

- 68 Metabolism of Solvents. R. Fabre and R. Truhaut.
Acta Pharmaceut. Internat. 1, 187-217, (1950). (In French).

The present paper points out differences in the metabolism of the same solvent in various species (rabbit incapable of methylating pyridine; swine incapable of mercapturic conjugation). This point appears to be of prime importance, because it calls attention to the need for exercising great caution before drawing conclusions from animal to man. -- Biol. Absts.

- 69 Etiologic Factors in Bronchiogenic Carcinoma with Spécial Reference to Industrial Exposures. Report of Eight Hundred Fifty-Seven Proved Cases.
E.L. Wynder and E.A. Graham. Arch. Ind. Hyg. & Occ. Med. 4, 221-235, (September, 1951).

The authors report an extensive survey of cancer in workers in various industries, and present data on cancer incidence, and exposure to various dusts and other atmospheric contaminants. A very large portion of the data and discussion relate to the possible effects of tobacco smoking on cancer incidence.

- 70 Silicon Granuloma of Skin Due to Traumatic Sand Inoculation.
J. E. Ginsberg and L.A. Becker. J. Am. Med. Assn. 147, 751-753, (October 20, 1951).

Silicon granulomas of the skin are fairly common but generally not recognized. They may appear 2 to 29 years after inoculation of the skin with sand. A case is described. The microscopic changes resemble those described in granulomas caused by beryllium, talc, and asbestos. Silica particles could be demonstrated in healed lesions with the polarizing microscope. Aureomycin therapy was successful.

INDUSTRIAL DUSTS

- 71 Report Upon the Work of the Silicosis Medical Bureau for the Three Years August 1, 1944 to July 31, 1945; April 1, 1946 to March 31, 1947; April 1, 1947 to March 31, 1948. Union of South Africa (A.S.W. Verster, Chairman). Govt. Printer, Pretoria, 57 pp., (1950). (Price 8s6d).

The report follows the lines of its predecessors, and relates progress in several phases of silicosis investigation. The examinations for the initial certificate of fitness to work in a dusty occupation are considered of great importance, and have been conducted on a large scale. Up to 40% of applicants are passed as fit, 30% deferred and 30% rejected.

The incidence of compensable diseases is given in detail in schedules. The number of new cases has gradually fallen to 7.29 cases per 1000 examined. The total number of cases has risen in the last two years reported because of employment of miners in the second stage of silicosis who were previously debarred.

The greatest improvement has been found in African laborers. The rate of progression of compensable diseases has diminished during recent years, especially tuberculo-silicosis. Details of the correlation of symptoms, etiology, radiography, and pathology of silicosis are given. The conclusion to be drawn from this correlation series is that generalized mottling of the radiograph, especially in the upper zones, is the only reliable sign of silicosis.

-- Cond. from Bull. Hyg.

- 72 Pneumoconiosis in Boiler Scalers. H.E. Harding and A.P. Massie. Brit. J. Ind. Med. 8, 256-264, (Oct., 1951).

Pneumoconiosis in boiler scalers is essentially similar to that found in coal workers. In the absence of respiratory infection the condition becomes sufficiently severe to produce disability only after 30 years' exposure.

-- Authors' Summary

- 73 Silicosis and Chronic "Cor Pulmonare." J. Porto. Gaz. Med. Portuguesa 4, 47-58, (1951). (In Portuguese).

A study of silicosis of nodular type, and especially of its effects to the heart and circulation, led the author to the general conclusion that cyanosis and polycythemia are rare or even exceptional in that condition, and that death is due either to tuberculosis or to the progressive reduction of available alveolar space, and not to heart disease. The pathological effects of silicosis, based on tests on living subjects and on post-mortem examinations, are described; only minor effects on the

heart or its function were found. It is concluded that there are ample reserves in the pulmonary arterial system and a capacity for adaptation of this circulation; the extensive zones of sclerosis and of destruction of the arterioles are not sufficient in themselves to cause any considerable repercussions on the heart, at least beyond certain limits. The pseudo-tumoral type of silicosis was not included in the study.

-- Cond. from Bull. Hyg.

- 74 Pathological Anatomy of Silicosis. W. DiBiasi.
Beitrage z. Silikose-Forschung, No. 3, 95 pp., (1949). (In German).

This is a survey of the entire field of silicosis, with a detailed report of pathological observations based on nearly 9,000 necropsies, chiefly from the coal mining area of the Ruhr. The paper is of interest to pathologists making a thorough study of silicosis. A satisfactory summary of the work would greatly exceed the space available, and the reader is referred to an extensive review in Bulletin of Hygiene, August, 1951.

-- Bull. Hyg.

- 75 Further Observations on an American Re-Elaboration of Velicogna's Piezoelectric Hypothesis on the Pathogenesis of Silicosis. L. Parmeggiani.
Med. Lavoro 41, 124-135, (April, 1950). (Italian with English Summary).

The author raises serious objections to the piezoelectric theory of silicosis, first proposed by Velicogna and later developed by S.M. Evans and coworkers in the United States (Tissue Responses to Physical Forces, IHF abstract 34, January, 1949; also J. Lab. Clin. Med. 34, 592-615, May, 1949; Am. J. Path. 25, 806-807, July, 1949, not abstracted by IHF).

The force of Parmeggiani's criticisms can be appreciated only by a full study of Evans' papers. His main objections are: (1) Evans has neglected known properties of crystals and their electrical properties; (2) the piezoelectrical effects are very small and would be dissipated by the presence of body liquids; (3) silicotic fibrosis does not appear in close contact with siliceous dust; (4) silicosis appears in non-contractible organs which do not supply the pressures involved; and (5) cristobalite, which is not piezoelectric, is perhaps even more pathogenous than quartz.

-- Adapted from Author's English Summary

- 76 Mineralogical Problems in Silicosis Research. Landwehr (no initials).
Beitrage z. Silikose-Forschung No. 9, 15-28, (1950). (In German).

Additional features of the study of silicosis in German mines (IHF abstract 486, May, 1951) are presented here. Certain rocks high in quartz but with a matrix of clay and carbonates had very little quartz in the finest fraction and produced little disease. The author concludes also that small amounts of quartz can be inactivated by excess carbonates. Pure sericite mica is harmless but in mixtures with quartz it is more

dangerous. In following the dust composition at different places from the origin of the dust alterations due to differential settling occur. This settling depends more on the shape of particles caused by cleavage than on their density. The quartz percentage may therefore increase or decrease, according to circumstances. When x-ray diffraction and chemical techniques are applied to the respirable fractions, it appears likely that the same relations hold. Figures are reproduced of allegedly silicotic nodules which show under the petrological microscope in one case much quartz and sericite, and in the other, chiefly iron ore, sericite, and some limestone. Further work in this field is required to differentiate between silicosis and siderosis. Future work will be concerned with silica solubility studies, electrical charges of dust particles, and the effects of ultrasonics. Medicine and mineralogy link up closely in the study of tissue sections from silicotic subjects and in sputum investigations.

-- Cond. from Bull. Hyg.

- 77 Bronchoalveolar Structure and the Distribution of Lesions of Pneumoconiosis. G. Mottura. Med. Lavoro 42, 81, (March, 1951). (In Italian).

The author further elaborates the theory that dust particles are carried away in the lymphatic fluid without the advent of phagocytes. He states that the elementary silicotic changes are in relation to the deficient lymphatic drainage of the dust, which stagnates in the radicular connective tissue of the lymphatic pathways, not in the actual lymphatic channels. In this connective tissue the dust gives rise to fibrosis, which further aggravates the impediment to the transmission, until it determines the sprouting of the processes into the collateral pathways.

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

- 78 Mechanism of Penetration of Inhaled Dust Particles into the Pulmonary Interstices. G. Mottura. Med. Lavoro 42, 1, (January, 1951).

The question whether dust particles penetrate from the alveoli into the pulmonary interstices and thence into the draining lymph is discussed, on the basis of bibliographic data and the results of personal observations. The interstitial fluid of the alveoli and of the alveolar ducts must be considered as connected to the structures of the reticular connective tissue. Canalized lymph exists only at the level of the fibrous connective tissue which accompanies the precapillary and postcapillary blood vessels, the bronchiolar structures, and the interlobular septa. The particles of inert dust, and for the most part, quartz dust, are probably transported by the flow of interstitial fluid along the space between the surface of the alveolus and the source of the lymphatic vessels without any manifest participation of migrant phagocytes.

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

- 79 Lobar Deposition and Retention of Inhaled Insoluble Particulates.
H.E. Stokinger, L.T. Steadman, H.B. Wilson, G.E. Sylvester,
S. Dziuba and C.W. LaBelle. Arch. Ind. Hyg. & Occ. Med. 4, 346-353,
(October, 1951).

The rates of alveolar deposition and elimination of insoluble particulates were determined for each of the lobes of the rat lung following inhalation of uranium oxides of different mass-median particle sizes. Significant differences were found between the various lobes and between two lungs. The percentages of alveolar deposition for two sizes of dust (2.6 and 0.45 MMD) were calculated, and the nasal filtration cut-off point was estimated at about 0.7 micron for the rat.

-- Cond. from Authors' Summary

- 80 X-Ray Diffraction Study of Sputum in Silicosis. F. Meyer and S. Solomon.
Arch. Ind. Hyg. & Occ. Med. 4, 443-445, (Nov., 1951).

The presence of silica was shown in the sputa of persons with silicosis by x-ray diffraction analysis. Positive x-ray diffraction identification of silica was obtained in the sputa of all four persons with severe silicosis investigated. No evidence of silica was found in the sputa of 10 control patients. While the presence of silica has been previously demonstrated by x-ray diffraction in lung tissue obtained at autopsy, the present study appears to be the first report on the successful application of this method to sputum obtained during life. The method as used in this study was not quantitative. Considerable work will be required to determine whether x-ray diffraction of sputum has a place in the clinical diagnosis and investigation of silicosis.

--Authors' Summary

- 81 Causal Relation of Bronchitis, Emphysema, and Pleurisy to Silicosis.
F. Janda. Pracovni Lekarstvi 2, 261, (December, 1950).
(In Czechoslovakian).

Bronchitis, emphysema and pleurisy are frequent findings in silicosis. Bronchitis is a normal accompaniment of silicosis, due both to the action of dust without consideration of its chemical composition and to the action of the complicating infection. The infectious bronchial pousses can make the silica deposited in the lungs demonstrable by x-rays. The lung emphysema belongs to the picture of more serious silicosis, a result of the involvement of the bronchi and of the fibrosis of lung tissue; in less serious cases it is reversible. Pleurisy, for the most part, is related to the associated tuberculous infection, but the dust cells themselves may get access to the subpleural spaces, with resulting local inflammation and subsequent adhesions. The problem may be solved practically both in placing workers in dust-producing trades and in compensation of silicosis as an occupational disease. If

everybody working in dust-producing places is carefully watched from the time of his work placement to its discontinuation, there will be enough material at hand to clarify what is generally known as the human factor in silicosis. --Cond. from Arch. Ind. Hyg. & Occ. Med.

- 82 Frequency and Clinical Symptoms of Cancer of the Lung in Silicosis.
E. Westermann. Beitrage z. Silikose--Forschung, No. 12, 33pp., (1951). (In German).

Lung carcinoma does not occur more frequently in coal miners than in the general working population. Among 13,900 necropsies at a hospital in the Ruhr coal mining area, 200 cases of lung carcinoma were found. Records of fifty-one cases had been preserved. The diversity of ages of the men, of localization of the tumor, and of complications such as pleuritis, metastases, tuberculosis, bronchitis, pneumonia, etc., all suggest that there is no causal relation between silicosis and tumor.

The data on which these conclusions are based are given in detail. Various case histories and radiographs are given to demonstrate the difficulties of recognizing the carcinoma in the presence of silicosis, especially if tuberculosis is also present. Only six of the fifty-one were, in fact, correctly diagnosed at an early stage of the tumor. As regards therapy, pneumonectomy is recommended for stage 1 silicosis only. -- Cond. from Bull. Hyg.

- 83 Results of Periodical Examinations of Workers in an Asbestos Factory.
A. Bohme. Beitrage z. Silikose Forschung No. 11, 27-34, (1951). (In German).

Since radiological supervision and control measures were adopted in an asbestos factory in 1936, the dust hazard has been greatly reduced, as shown by comparing results of surveys in 1936, 1940, and 1949. A comparison of different working places shows that the risk is low in spinning and weaving, but high in preparation, carding and brake polishing. A table shows results for 14 cases from 1936 to 1949. Some progressed, others did not. Inquiries among former workers reveal little if any tendency to progression after the dust exposure has ceased. This is in contrast to silicosis. On the other hand a personal factor exists, as in silicosis, as a number of workers do not get asbestosis in spite of high dust exposures.

Progressive tuberculosis is rare, only two cases being found, both started in the parts of the lung least affected by asbestosis. One combination of asbestosis and carcinoma of the lung was found. The main result of this study is the demonstration that the hazard can be reduced by dust control. --Cond. from Bull. Hyg.

84

Research into Pulmonary Asbestosis in Belgium. J. Clerens.
Arch. Belges Med. Social et Hyg. 8, 557-565, (November, 1950).

The investigation concerns the fibro-cement industry, in which asbestos is crushed and mixed with cement. Enclosed apparatus prevents most of the dust from escaping; in the most dusty locations, 20 to 40 million particles per cubic foot were found, with 50% under 5 microns. The workers have been examined periodically over a period of three years. Out of 75 men employed for seven to over thirty years, there were four doubtful cases, and only one presented x-ray shadows indicating pneumoconiosis. The man died of progressive circulatory insufficiency, and details of post-mortem findings are given.

Indurated nodules and asbestosis bodies were found throughout the lungs, but no tubercle bacilli. The bodies were seen in fibrous zones, in the alveoli, and even included within giant phagocytes. This man, aged 49, had been totally incapacitated with dyspnea on exertion and cardiac failure. In others, asbestos particles were found in 10 out of 12 samples of sputum, and asbestosis bodies in 3 samples, but the findings were not associated with x-ray shadows indicating fibrosis. The evidence is against much danger arising from the manufacture of fibro-cement.

-- Cond. from Bull. Hyg.

85

The Pneumoconiosis of Slag Mills. P. Gengoux. Arch. Belges Med. Sociale et Hyg. 8, 514-518, (October, 1950).

The slag produced in the basic, or Thomas, process of steel manufacture is used as a fertilizer and for this purpose is reduced to a very fine powder. Out of 93 workers with at least 10 years' exposure to slag dust 15 showed radiographic changes which could have been caused by dust. In only one case did the lung appearance go beyond the micro-nodular stage; there was no evidence of massive shadows, in spite of the frequent association of tuberculous infection in the more or less active state (5 cases). The conclusion is that the health of basic slag workers is not bad.

-- Cond. from Bull. Hyg.

86

Roentgenologic Aspects of Pulmonary Changes Caused by Ocher.
R. Haubrich. Fotschr. Geb. Rontgenstrahlen 73, 682, (December, 1950).
(In German).

Numerically the pneumoconiosis caused by the earth pigments (metallic oxides occurring in clay) are of minor significance, because the ocher industry, which processes these pigments, employs a limited number of workers. However previous reports on several small groups of patients indicate that the pneumoconiosis caused by these pigments has certain characteristic aspects. After briefly discussing the minerologic aspects of these pigments and some earlier reports on the

pulmonary lesions caused by them, Haubrich presents his own observations on eight patients with ocher-dust pneumoconiosis. Five of the eight patients had the typical roentgenologic characteristics of pneumoconiosis caused by ocher dust. The pulmonary markings are minute spots, or there may be a network of stippling. Among the various types of pneumoconioses it resembles most closely that caused by iron dust, but the ocher-dust pneumoconiosis develops much less rapidly than the iron-dust pneumoconiosis. Only one case of ocher-dust pneumoconiosis has been observed in which the pulmonary markings had advanced to the third, most advanced stage. This case concerned a worker who had been grinding ocher for 52 years.

The author briefly discusses the roentgenologic and pathogenetic aspects of the four types of lesions which involve the deposition of iron in the lungs; those caused by ocher dust, iron ore, iron (siderosis of welders), and hemosiderosis (with chronic pulmonary congestion).

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

- 87 Effect of Aluminum Dust on Susceptibility to Lobar Pneumonia--Animal Experiments. F.J. Vintinner. Arch. Ind. Hyg. & Occ. Med. 4, 217-220, (September, 1951).

Exposing rats to high concentrations of fine aluminum dust as in these experiments did not increase their susceptibility to Type 1 pneumococci injected intrabronchially in mucin. In fact, such exposures appeared to increase their resistance to lobar pneumonia. This was shown by the fact that the mortality and case fatality rate were lower in the dust-exposed rats than in their controls. There was no appreciable difference in the incidence of infection between the dust-exposed and the control rats.

When the pneumococci were injected intrabronchially in broth there was, in general, a higher mortality in the dust-exposed rats than in their controls when the exposures were of long duration. There was no appreciable difference in the incidence of lobar consolidation in the dust-exposed and the control groups.

--Author's Conclusions

- 88 Severe Fibrosis of the Lung in Corundum Smelters. J. Hagen. Z. Ges. Inn. Med. 5, 31, (1950).

The author reports 25 cases of severe pulmonary fibrosis in men employed in the manufacture of corundum, describing three cases in detail and illustrating with roentgenograms. The discussion of the pathology largely corresponds with the author's other paper (IHF abstract 885, August, 1951).

--Cond. from Brit. J. Ind. Med.

- 89 Iron in the Lungs. A.T. Doig. Arch. Belges Med Sociale et Hyg. 8, 442-450, (July, 1950). (In French).

Siderosis, a form of pneumoconiosis due to iron dust, is distinguished from hemosiderinosis, in which iron is deposited from the blood in foci sufficiently dense to cause shadows. Siderosis may also be confused with silicosis. Prolonged and intense exposure to iron dust may cause x-ray shadows, without ill health, fibrosis, or disability; animal experiments have confirmed these clinical findings. On the other hand, boiler-scalers tend to inhale iron and silica in varying proportions, and their lungs exhibit reticulation or reticulo-nodulation with extreme dyspnea; the condition is simply silicosis. Fibrosis cannot be diagnosed by merely looking at an x-ray film, and the radiologist must beware of how he draws deduction from x-ray appearances. Iron is an inert dust.

-- Cond. from Bull. Hyg.

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 90 A Lawyer Looks at the Industrial Noise Problem. N.S. Symons. Occ. Hazards 14, 17, 18, 62, 63, (November, 1951).

The author discussed the application of the New York occupational disease law to industrial deafness. To many, principles of the law mean simply that a worker is not entitled to compensation until he suffers an actual loss of earnings due to occupational disability. However, New York courts have held otherwise, and have ruled that a worker is entitled to an award on the basis of partial physiologic loss, even though he has lost no time and has suffered no reduction of wages. The legal soundness of this "judicial law making" has been seriously questioned. Compensation is calculated by an arbitrary formula based on extent of hearing loss, measured in per cent or decibels. Hearing loss depends upon a number of non-occupational factors, which should be considered as well as occupational causes.

Another problem is how long deafness must persist in order to be considered permanent. Two diametrically opposite court decisions on that point have been given. As yet there is no satisfactory scientific method of estimating hearing loss. The ultimate solution should be simple as well as sound. Two simple concepts should be considered; that of understandable speech and that of distance.

There are also minor questions to be considered: previous employment, statutes of limitations, more definite standards with respect to causes of occupational deafness, practical noise-susceptibilities, dissemination of knowledge relating to the industrial noise problem,

and cost. Industry should be willing to pay the worker, at the proper time, for actual hearing loss resulting from his occupation. The worker, on the other hand, should not ask industry to pay for deafness from other causes than his occupation.

- 91 Two Cases of Kienbock's Disease. S. Tara and H. Gras.
Arch. Malad. Profess. 12, 19-25, 1951.

Kienbock's disease concerns the semilunar bone of the wrist, which becomes thickened, hypercalcified, and opaque to x-ray. The wrist becomes more and more painful, with limited movement. The disease is found among manual workers liable to repeated injury, such as is generated by pneumatic tools. Most cases benefit from complete immobilization in plaster, with radio-therapy; surgical interference is rarely necessary. The two cases reported give examples of recovery from each of these forms of treatment. It is stressed that the condition is of traumatic, therefore, of occupational origin, justifying a claim for compensation.

-- Cond. from Bull. Hyg.

- 92 The Differential Diagnosis of Chronic Osteoarthritis in Caisson Disease.
F. Molfino. Rass. Med. Ind. 19, 274-275, (Nov.-Dec., 1950).
(In Italian).

In caisson disease, osteoarthritis progressively develops into anatomical and functional changes which lead to crippling in a few years. The author has studied 12 patients with caisson disease. One or both hip joints were involved in 9, and one or both shoulder joints in three. X-rays showed cystic changes with some surrounding osteo-sclerosis. In a few cases the joint cartilage was involved and suggested osteoarthritis deformans.

-- Cond. from Bull. Hyg.

RADIOACTIVITY AND X-RADIATION

- 93 Your Guide to Radiological Safety. P.C. Tompkins.
Atomic Energy Comm. NP-3332, 16 pp., (No date).

This is a pocket-size pamphlet giving safety rules for the scientist who is working with radioactive materials.

-- Nuclear Sci. Absts.

- 94 Three Keys to Radiological Safety. P.C. Tompkins.
Atomic Energy Comm. NP-3333, 15 pp., (No date).

This is a pocket-size pamphlet giving safety rules for the nonscientific person who is working in a laboratory where radioactive materials are used.

-- Nuclear Sci. Absts.

- 95 Radium Toxicity Program: A Progress Report of Clinical Studies on Twenty-Four Patients. W.B. Looney. Atomic Energy Comm. ANL-4666, (July, 1951).

Clinical studies were made of a group of 24 patients who received radium chloride 20 years previously. The clinical data are given in detail. Results of roentgenographic examination of 19 of the patients are presented. The bone density had changed in 17 patients, and the normal configuration of the bones had been altered in eight. No direct relationship was observed between the roentgenographic changes or symptomatology and the amount of radium remaining in the body. It was concluded that radium plus an unknown factor or factors combine to produce bone disintegration.

-- Cond. from Nuclear Sci. Absts.

- 96 Industrial Radium Poisoning. H. Roth.
Deut. Med. Wochschr 76, 776-777, (1951). (In German).

Radium poisoning in contrast to many other industrial poisonings takes a course which lingers over years, and is comparable in some respects to the latent phase of an infection, and occasionally causes general injury to the hardness of the organism. Care must be devoted to the avoidance of occupational injury from radioactive substances through intensive industrial hygiene protective measures such as sufficient ventilation of the workroom, protection against rays, and a watch on the health of exposed persons.

-- Chem. Absts.

- 97 Diagnosis, Prognosis, and Treatment of Radiation Injuries Produced by Atomic Bombs. E. P. Cronkite. Radiology 56, 661-669, (May, 1951).

It is widely believed that panic caused by an overwhelming fear will be the greatest hazard in the event of an atomic explosion. Education and indoctrination of the public should allay this greatest hazard in atomic warfare. Radiation injury resulting from atomic weapons is of two types: (1) superficial ionizing radiation burn from soft radiation, and (2) total body radiation injury from penetrating whole-body radiation. In case of injuries to a large number of people, classification on the basis of likelihood of survival may be desirable. Distance from the explosion, radiation dosimeters, and symptomatology may aid

segregation into groups to facilitate prognosis and treatment. Prognosis may be based on whether vomiting occurs on the first day, and on the symptoms that follows. If there is no vomiting on the first day, survival is probable unless there are complicating factors, such as burns, traumatic injuries, or concomitant epidemics which may be catastrophic in a leukopenic population. There is no new drug, hormone, or vitamin that will increase the survival rate; however, it may be possible to increase the survival rate by accelerating recovery of hematopoiesis.

-- Cond. from J. Am. Med. Assn.

- 98 On the Possibility of Demonstrating X-Ray and Ra Damage in Personnel by Observation of the Prothrombin Level in the Blood. F.K. Beller, Jr. Fortschr. Gebiete Roentgenstrahlen 75, 95-8, (July, 1951). (In German).

Through observations on the personnel of a radiological institute, it is established that slight radiation injuries cannot be demonstrated by the decrease of the prothrombin level. It appears that, in a general way, x-rays do not affect the clotting potential of the blood. This conclusion is confirmed by the fact that various authors give discordant information on changes produced by radiations in the differential blood picture and in the coagulation time.

-- Nuclear Sci. Absts.

- 99 Nursing Care Following Exposure to Ionizing Radiation. Ruth Freeman. Am. J Nursing 51, 86-88, (Feb., 1951).

Effects of radiation sickness characteristically present, such as blood changes, shock reaction, gastrointestinal symptoms, and rise in temperature are described. Phases of radiation sickness are considered. Lists of points on nursing aid for appraisal of radiation injury, maintaining the injured person's resistance, preventing infection, restoring body fluids, and providing emotional guidance are assembled.

-- Nuclear Sci. Absts.

- 100 Stray Radiation from Diagnostic X-Ray Beams. B.E. Keane and G. Spiegler. Brit. J. Radiology 24, 198-203, (April, 1951).

The results of measurements of quantity and quality of scatter outside the patient from 60 to 100 kv diagnostic x-rays are presented. Scattered doses, expressed in terms of dose per incident roentgen, for various incident qualities, are presented as functions of the cross section of the beam, and the thickness of the layer of tissue between the primary beam and the observer. Side-scatter radiation outside the patient has been found to be harder than the incident radiation for diagnostic beam. The factors influencing scatter are discussed. An approximate mathematical theory is developed from Mayneord's (Brit. J. Radiology 13, 242, (1940)) integral dose considerations.

-- Nuclear Sci. Absts.

- 101 Roentgen Hygiene. R. Steinert. Nord. Med. 46, 1165-1167, (August 1, 1951). (In Norwegian).

The protective effect of roentgen gloves with a lead equivalent of 0.2 to 0.5 was measured by placing chambers of 5 mr sensitivity and 300 mr capacity inside the gloves. Only gloves of 0.5 lead equivalent completely protected the physicians' hands in routine x-ray examinations in which 70 kv and 3 to 4 mr were used in each experiment. With hands unprotected, the permitted daily tolerance dose was exceeded in a relatively short time.

-- Nuclear Sci. Absts.

- 102 Radiological Monitoring for Civil Defense. J.B.H. Kuper. Atomic Energy Comm. AECU-1507, 7 pp., (No date).

Suggestions are made for a practical radiological monitoring system for civil defense. It is recommended that there be two types of monitoring teams in widely differing numbers, with different levels of training and types of equipment: about 30,000 teams of "wardens" whose function is the simple decision that an area is clean, and 150 to 200 teams of "surveyors" who should be able to evaluate dosage from a mixed radiation field and to compute permissible working times for emergency personnel. General suggestions are made on the equipment and training necessary for each group.

-- Nuclear Sci. Absts.

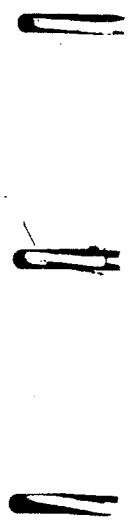
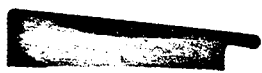
- 103 Lung Carcinoma in an Industrial Population at an Atomic Pile Site. R.A. Love. Atomic Energy Comm. AECU-1620, 3 pp., (No date).

Incidence of primary lung carcinoma was found to be much higher than expected in the industrial population at Brookhaven National Laboratory during a one-year period. Radiation exposure was shown to be in no way responsible for this high incidence.

-- Nuclear Sci. Absts.

- 104 Reducing the Radioactivity of Contaminated Water. A.H. Emmons and R.A. Lauderdale. Safety Maint. & Prod. 102, 40, 44 (Oct., 1951).

This interim report describes a process and apparatus for decontaminating water that has become radioactive by solution of fission products or other radioisotopes. It is accomplished by contacting the water with steel wool, clay, activated carbon, an anion exchange resin and a cation exchange resin. The contamination in water so treated has been found to be well below the limit for safe use.



ENVIRONMENTAL MEASUREMENTS

- 105 Direct Determination of Toxic Vapors by Ultraviolet Absorption.
J. Bouillot. Bull. Soc. Chim. France 18, 317-318, (May-June, 1951).

Using the method described in the foregoing abstract, modified by use of a 5-meter cell instead of a 3-m. cell, the following amounts of vapor can be determined per liter of air; 1.0 to 0.01 mg. of benzene, aniline, pyridine, styrene, carbon disulfide, or phenol; 1.0 to 0.1 mg. of xylene, toluene, cresols or sulfur dioxide; 10 to 0.1 mg. of trichloroethylene, and 10 to 0.5 mg. of nitrobenzene. -- Chem. Absts.

- 106 Optimum Range for Maximum Accuracy in Biological Lead Analyses by Dithizone. A.S. Landry. Ind. Health Monthly 11, 103, 105, (July, 1951).

The author presents analytical results showing that the maximum accuracy for lead determination by dithizone by the method of Bambach and Burkey occurs at about 12 micrograms of lead, although the accuracy is essentially as good in the range of 4 to 40 micrograms.

- 107 Contribution to the Study of the Toxicology of Trichloroethylene.
I. Estimation in Biological Media. R. Fabre and R. Truhaut.
Brit. J. Ind. Med. 8, 275-278, (October, 1951). (In French).

We have established a method for the simultaneous estimation of trichloroethylene and trichloroacetic acid in biological media. After having driven off the trichloroethylene by a current of warm air and having taken it up in pyridine which has been kept very cold, photometric estimation is carried out by the color method of Fujiwara employing alkaline pyridine, sensitized and rendered more specific by an original method using a homogeneous water-alcohol phase. Trichloroacetic acid remains in the residue after getting rid of the trichloroethylene and is estimated separately by a photometric technique, after precipitation by tungstic acid, derived from that proposed by Powell and used for estimating trichloroacetic acid in blood. -- Authors' English Summary

- 108 Direct Spectrographic Detection of Toxic Amounts of Benzene in Factory Atmosphere. J. Bouillot and A. Berton. Bull. Soc. Chim. France 18, 317, (May-June, 1951). (In French).

The concentration of benzene vapor in air can be determined directly with an ultraviolet spectrograph. The sample is placed in a quartz-windowed cell 3 meters long and 2 cm. in diameter. Light from a

hydrogen-discharge lamp (continuous spectrum) is passed through the sample and the absorption at 2682, 2611, 2547, 2480, 2430, and 2375A is determined. Concentrations as low as 0.05 g. of benzene per cu. m. of air can be determined. Since the toxic concentration of benzene is 0.1 g. per cu.m., the method can be used for air toxicity control work. The method can also be used for the detection of xylene, toluene, and chlorinated ethylene.

-- Chem. Absts.

- 109 Determination by Means of Ultraviolet Absorption Spectra, of Vapors of Benzene, Toluene, and Xylenes in Combined Products and in the Air of Workrooms. J. Bouillot and A. Berton. *Chim. Anal.*, 261-266, (1951). (In French).

By the proposed method, 10 mg. of benzene, 50 mg. of toluene, and 100 mg. of xylene can be detected in 1 cu.m. of air. Ultraviolet light is passed through a Pyrex glass tube which is about 5 meters long and 18 mm. in diameter. For the observation the slit of the spectrometer is opened to 0.01 mm. and the time of exposure is 40 seconds. The 5 lines characteristic of benzene, 2 lines of toluene, and 2 of xylene are listed and full details are given for carrying out the tests.

-- Chem. Absts.

- 110 A Method for Determining Benzene and Toluene in Mixed Solvents and in Air. R. Fabre, R. Truhaut and M. Peron. *Ann. Pharm. Franc.* 8, 613-626, (1950).

To solve the problem of separately determining benzene and toluene when they were present simultaneously in a solvent or in the atmosphere, the authors employed the color reactions given with butanane in an alkaline medium by the m-dinitro derivatives of the hydrocarbons, reactions which Schrenk, Yant, and Pearce had formerly applied for the quantitative determination of these substances without regard to their discrimination.

The technique of double determination recommended by A. and R. Fabre (IHF abstract 194, February, 1949), has been simplified by the use of a special alkaline-saline reagent which permits benzene and toluene to be determined separately, with an error below 5%, without the necessity of using a double nitration. By the preliminary ether extraction of products resulting from the nitration, followed by the taking up of the residue of ether extraction with butanane, the majority of the side colorations due to other compounds occurring with benzene and toluene are avoided. On the basis of the data thus established, the authors indicate in detail a technique for determining benzene and toluene in complex solvents, as well as its application to air analysis.

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

- 111 Some Techniques and Equipment for Trace Quantity Sampling of Industrial Aerosols. W.B. Harris and H.D. LeVine. Atomic Energy Commission NYO-1534, 24 pp., (November 29, 1950).

The use of filter-paper collection of air samples is compared with other methods, and the advantages of filtration are discussed where gravimetric or radiometric analysis is desired. The design and construction of two reliable light-weight air samplers are given. One of these is for the range to $0.03 \text{ m}^3/\text{min.}$ while the other will operate to $2.0 \text{ m}^3/\text{min.}$ Filter-paper characteristics, cascade-impactor characteristics, and field techniques for microgram aerosol concentrations are discussed.

-- Nuclear Sci. Absts.

- 112 Characteristics of the Suction Soap Film Meter. The Suctionometer-- A New Low-Velocity-Measuring Device. B.D. Bloomfield and L. Silverman. Arch. Ind. Hyg. & Occ. Med. 4, 446-457, (Nov., 1951).

An instrument, the suctionometer, for measuring low air velocities is described. It uses the speed of a soap film traveling through a transparent, horizontal tube. This speed is a function of the velocity of the air stream passing the suctionometer plate and can be expressed by a simple equation. The instrument is simple, directional and integrating and is not affected by normal temperature changes. The device is inexpensive (costing less than \$5.00), and appears to respond as well as the devices used for calibration. Its useful range is 50 to 500 feet per minute, although velocities approaching 1,000 fpm can be measured rapidly. The suctionometer should be calibrated with an instrument that indicates accurate velocities or by a rotating-arm displacement device.

-- Cond. from Authors' Summary

- 113 Impingement of Dust from Air Jets. C.N. Davies, Mary Aylward and Dorothy Leacey. Arch. Ind. Hyg. & Occ. Med. 4, 354-397, (Oct., 1951).

The authors present the results of an extensive study of impingement and methods of collecting dust by impingement procedures. First they conducted an elaborate comparative study of several well known dust sampling instruments, using a standard cloud of coal dust. That was followed by similar study of the same instruments with quartz dust, on a more limited scale. The remainder of the paper deals with experiments on air flow in jets and their bearing on the collection of loose particles, the performance of impingement jets with particles under 1.25 microns, and a discussion of the theory of impingement. The instruments studied were the Kotze and British konimeters, the Owens jet counter, and Bausch and Lomb counter, a cascade impactor specially modified for the tests, and the midget impinger.

The thermal precipitator was used as the standard of comparison because its performance is consistent. The Owens counter and the Bausch

and Lomb counter were used with and without saturation with water vapor and with and without a viscous liquid on the collecting plate. It was shown that the efficiency of any of the instruments is limited by a number of positive and negative errors, including disintegration of aggregates and large particles in the nozzle and on the plate, retention of particles in and near the orifice, and removal from the plate by the air current.

These factors vary with the slit size, air velocity, and design of the instrument. The use of a viscous liquid on the plate increases the efficiency of collection, but jeopardizes the accuracy of microscopic examination below 2 microns. Overall efficiencies on the basis of weight and particle count, and efficiencies for various size ranges are reported. A fair presentation of the values obtained would require considerable space, and the reader can only be referred to the original paper for those figures, for details of the method, and for the thorough theoretical discussion.

The authors have made an outstanding contribution to the knowledge of the subject, and the paper should be read by those concerned with the accuracy of dust collection procedures.

- 114 Use of Pitot Tube in a Dust-Laden Gas Stream. T.H. Hughes and C.P. Sayles. Engineer 191, 503-505, (April 20, 1951).

When sampling dust in a gas stream it is essential that the velocity in the sampling tube shall not vary, beyond certain limits, from the velocity of the main stream at the sampling point. Since velocity is rarely uniform over a cross section of a pipe, then the velocity at each sampling point in the cross section should be taken. When velocities are sufficiently high this may be done with a pitot tube. When used for flue gases no blocking of the pitot tube is likely, but when used with heavy laden gases i.e. primary air supply to a pulverized fuel burner, then a method of preventing dust blocking the pitot tube is needed. Apparatus described was developed for this purpose at Fuel Research Station during trials on velocity distribution in a primary air pipe-line in a power station pulverizer.

-- Atm. Poll. Bull.

- 115 Guide Dusts as Aids in the Optical Analysis of Air Borne Dusts. A. Lobner. Staub, 281-288, (October 15, 1950). (In German).

In order to trace specific sources of air pollution, it is helpful to identify and count typical dust components (guide dusts) which may be recognized on microscopic examination of specimens of air-borne dusts. Examples are given which show good correlation between such counts made by incident-light microscopy, and chemical analyses, of samples collected at various distances from the source of the dust, for zinc oxide from a zinc smelting factory.

The potential danger of open refuse heaps in Berlin shortly after the end of the war was assessed from observations of the characteristic

reddish-brown lignite ash which decreased rapidly as a dust component over a distance of twenty yards. Air pollution from a cement factory was traced by observation in polarized light of highly double-refracting cement particles. The technique does not replace quantitative chemical analysis but is considered as a useful additional rapid method. -- Bull. Hyg.

- 116 Investigation of Performance and Limitations of Konimeter. D.G. Beadle. J. Chem.-Met. Min. Soc. So. Afr. 57, 265-283, (March, 1951).

In the first section of this paper dust counts obtained with a konimeter at 10 second intervals over a period of 30 minutes or longer are used for an elementary statistical analysis to determine how accurately the mean of any stated number of samples over a given time represents the "true mean konimeter count." In the second section the efficiency of the circular konimeter is determined using the thermal precipitator as a reference instrument. The collecting efficiency of the konimeter is found to depend to a large extent on the size distribution of the dust sampled, and also on the concentration. The past value of the konimeter in reducing silicosis in Witwatersrand gold mines is stressed, but the view is expressed that there is now a need for a more accurate instrument for routine dust sampling. -- Atm. Poll. Bull.

- 117 Sampling Airborne Dust in Collieries. A Modification of the Thermal Precipitator Technique. R.G.H.B. Boddy. Coll. Guard. 183, 291-294, (September 13, 1951).

The usefulness of the thermal precipitator underground is limited by the necessity of removing the plug for each sample and thereby introducing contamination. In the modification described the cover-glass is attached to the plug, which can be rotated in the head so as to present a clean portion of cover-glass for each sample; that is, a number of strips are obtained, crossing in the middle like the spokes of a wheel. The center is not counted. A super-stage bearing the slide supporting the cover-glass simplifies counting. Eight strips can be taken, but four is a convenient practical limit. The cover-glasses are prepared in the laboratory and the samples are carried back to the laboratory in the precipitator. It has been found in practice that the adoption of this simple technique increases appreciably the number of countable slides.

- 118 Standard Apparatus for Measuring Dust Samples. E. Quinot and J. Carbonnel. Rev. Med. Miniere 3, No. 11, 109-117, (1950). (In French).

In this apparatus a compressed-air injector causes dust-laden air to pass through a tetrachloronaphthalene filter. The volume of air is measured by a flowmeter incorporated in the instrument. The filter is then dissolved in benzene, and the solution is twice centrifuged and

decanted to collect the dust. Then the particles are made wettable by peptization, by which they are covered with gum arabic. The dust is then fractionated by sedimentation in distilled water, and the fractions are examined microscopically; or chemical and mineralogical analyses may be made on sufficiently large samples. -- Cond. from Bull. Hyg.

- 119 Rapid Air Elutriator for Examination of Stack Dusts.
C.J. Stairmand. Engineering 171, 585-586, (May 18, 1951).

An elutriator developed to enable the direct determination of air free falling speed of particles comprising a stack emission is described. The elutriator covers the range of free falling speeds from 1.0 to 8.0 feet per second corresponding to particles from 80-370 microns diameter. Photographs and charts illustrate the apparatus and the method of use. -- Atm. Poll. Bull.

- 120 Simplified Pipette Analysis for Rapid Determination of Respirable Dust.
G. Pfefferkorn and F. Portheine. Arch. f. Hyg. u. Bakt. 133, 79-87, (1950). (In German).

The authors describe some modifications of the pipette method for separating the finer (under 5 microns) portions of dusts for analysis. The modifications are intended to make the method cheaper, simpler, and suitable for routine analysis. The authors recommended the use of a syringe fitted with a needle of about 0.9 mm. diameter to replace the expensive pipette analysis procedure. Lumbar puncture needles are said to be very suitable. Ammonium carbonate solution, 0.1% is recommended to replace the more expensive alcohol. The salt evaporates above 60°C. and no correction for it is required. -- Cond. from Bull. Hyg.

- 121 Observation Chamber for Ultramicroscopic Investigations of Aerosols.
O.E. Schweckendiek. Z. Naturforsch. 5a, 153-156, (1950). (In German).

After a review of research on particle size and its distribution in aerosols, of the Stokes-Cunningham formula, and of measurements of the falling velocity of aerosol particles by means of the ultramicroscope, the author discusses the difficulty of designing a suitable observation chamber and describes a vessel developed by himself which is claimed to be superior to those of Jander and Winkel and of Whytlaw-Gray.

-- Atom. Poll. Bull.

- 122 The Debye-Scheuer Method in the Analysis of Industrial Silica Dust.
L. Parmeggiani. Med. Lavoro 42, 10, (January, 1951). (In Italian).

The Debye-Scheuer x-ray diffraction method for analysis of dusts is described, and its application to analysis for free silica is presented. Its advantages over chemical methods and its limitations are

discussed. The transformation of quartz and of diatomite into cristobalite as an effect of heat treatments was particularly studied. The demonstration that cristobalite can cause silicosis destroys the hypothesis of the piezoelectric pathogenesis of silicosis, as pointed out in the author's other papers. -- Cond. from Arch. Ind. Hyg. & Occ. Med.

PREVENTIVE ENGINEERING

- 123 The Ventilation of Rock Galleries, in Relation to Experience Gained on the Plants of Electricite de France. Fourestier and Charpentier. Revue Ind. Min. No. 557, 533-563, (June, 1950). (In French).

The first part of the paper reviews the sources of contamination of mine air, and discusses the volumes of fresh air necessary to secure safe working. Particular attention is given to the contamination caused by Diesel locomotives and by explosives. In the second part, the ventilation installations in the plants of Electricite de France are described, and experiments on ventilation are reported. A tunnel with a closed end was constructed one-twentieth the size of an actual mine gallery. Experiments on removal of smoke were made, with ventilation by impulsion, aspiration, and combinations of the two.

Aspiration alone seemed to give much poorer results than impulsion alone. With a spell of aspiration between two periods of impulsion the distance of the air-line from the face is of capital importance. An arrangement of impulsion (1/2 min.), aspiration (6 min.), impulsion (1/2 min.), and aspiration (3 min.) gave good results. These results were applied in the ventilation of the mine gallery. -- Cond. from Bull. Hyg.

- 124 High Efficiency Collection of Radioactive Dust. K.F. Caplan. Heat. & Vent. 48, 79-82, (February, 1951).

The author covers the same ground as in his earlier paper for the Atomic Energy Commission (IHF abstract 412, April, 1951).

- 125 High Efficiency Industrial Filtration. E.A. Stokes. Ind. Heat. Engr. 13, 163-165, (June, 1951).

A material used in respirators for removing extremely fine toxic powders will shortly be available for industrial filtration of air. It combines filtration by impaction of foreign bodies on a densely compounded mass with electrostatic precipitation. It is made preferably of woollen fibre which is processed and formed into a lap in the presence of finely

divided resin, which becomes electrically charged in the process. The charge both prevents the resin from being dislodged and causes dust particles to be attracted. The deep bed allows a considerable dust load to accumulate with low pressure loss. The filter unit now in production removes 99.99% of all particles down to 0.2 micron when operating at 75 cu. ft. per minute. -- Atm. Poll. Bull.

- 126 The Borsari Apparatus for Dust Extraction in Mines. G. Pancheri. Rass. Med. Ind. 19, 217-224, (Sept.-Oct., 1950). (In Italian).

Borsari makes use of the air pressure generated by the recoil of the hammer of the pneumatic drill to suck up the dust from the drilling surface and to lead this dust into either a fabric bag or a drum fitted with special sleeves, a water screen, and a horse-hair filter for intercepting the dust. A rubber flange is fitted around the point of the drill and held tight against the rock surface to prevent the dust from escaping into the atmosphere.

In Pancheri's tests dust counts of 12,000 to 14,000 particles per cc. (350 m.p.c.f.) without the apparatus were reduced to between 340 and 780 particles per cc. (9.5 to 22 m.p.c.f.) with the extractor in use. Some of the dust in the mine shaft comes from other sources than the drilling; by the use of water sprays the dustiness was reduced as low as 133 particles per cc. (4 m.p.c.f.). -- Cond. from Bull. Hyg.

COMMUNITY AIR HYGIENE

- 127 Health Implications of Air Pollution. J.J. Bloomfield. Proc. Air Pollution & Smoke Prevention Assn. Am., 76-81, (1950).

The Donora and Meuse Valley disasters are briefly reviewed; in the former 43% of the population were affected, symptoms ranging from slight to extremely severe, with 20 fatalities. Severity appeared to increase with increasing age. Apparently a similar situation had occurred several years earlier but was not noted at that time. More data are needed on 24-hour maximum allowable concentrations--tentatively it is suggested that the maximum values used for 8 hours in plants be extended to 24 hours for exposure outside. Industry must cooperate with enforcement bodies, etc., in establishing limits. Caution is necessary in establishing limits in ordinances; if too severe, industry may be forced to leave or shut down. Limits should be such that the average person is protected. In many cases it will not be possible to protect those especially susceptible to a given condition. -- Chem. Absts.

- 128 Atmospheric Pollution. Eliminating Odor Nuisances.
L.C. McCabe. Ind. Eng. Chem. 43, 97A-100A, (Dec., 1951).

The material presented is based on an unpublished communication by Edelen and Clark, describing some of the sources of disagreeable odors in the Los Angeles area and the progress made in eliminating them. They include: preparation of fish meal, processing of dead animals, coffee roasting, oil refineries (especially from mercaptans), and paint and varnish plants. In each case improved methods and treatment of the effluents have eliminated most of the odors, and sometimes have led to recovery of materials.

MANAGEMENT ASPECTS

- 129 Letters to Nonsupervisory Employees. Elmer W. Earl, Jr. Studies in Personnel Policy No. 123, National Industrial Conference Board, Inc., 247 Park Avenue, New York 17, New York, 36 pp. Available to companies associated with the Board at \$1.00.

Business men now generally agree that it is a good idea to tell employees about company matters that affect them personally. Individual letters to employees have the following advantages: they provide a quick means for giving urgent information; they emphasize especially important information; the message is personalized and invites the attention of the wife and family; they assure uniform coverage; they are a permanent record of the information; they can boost the employee's morale; they require the executive to have a good understanding of employee's problems and attitudes; and they emphasize the common interests of employees in decentralized companies.

No information program can take the place of high standards of good human relations, but when they are present, letters constitute a good part of such a program. This study concerns the subjects to be covered in letters, the use of ghost writers, frequency, physical specifications, method of distribution, cost, and provisions for replies by employees. Forty "Do's and Don'ts" are listed in the report.

- 130 Help for the Accident Prone. F.P. Kiefer.
Safety Maint. & Prod. 102, 21, 54-59, (Oct., 1951).

Supervisors do not have to be psychoanalysts but they should have an understanding of the reasons why some people are prone to accidents. This paper tells about a program adopted by Sperry Gyroscope Company to educate foremen in the facts of accident proneness. The program

consisted of a series of one-hour conferences. Three basic points were made in each discussion: (1) the fact that accident-prone people exist; (2) the possible reasons for their susceptibility to injury; and (3) what the foreman can do about the problem they present.

Although it was difficult to select material and to condense it to the scope of the program, the course was successful and led to considerable discussion and to a desire to learn more about the subject.

- 131 Unsafe People. The Nature and Recognition of Accident-Proneness.
Anon. Coll. Guard. 183, 255-256, (August 30, 1951).

Accident-proneness may be temporary or permanent. The temporary form may be due to inexperience or illness. New young workers have a high accident rate, especially since they may undertake tasks beyond their strength from a spirit of daring or from a desire to show off. The wise training officer discourages those venturesome practices without exaggerating the dangers. Permanent accident-proneness arises from nervous disorders. A record should be kept of accidents to each employee in order to locate such persons, or if accidents prove to be frequent in groups of workers, to reveal plant conditions that may be responsible. The only action to be taken with accident-prone individuals is to transfer them to a safer occupation.

- 132 The Application of Psychiatry to Industry. Report No. 20, Committee on Psychiatry in Industry of the Group for the Advancement of Psychiatry, 3617 W. 6th Avenue, Topeka, Kansas. 10 pp., (July, 1951). Single copies available on request at this address.

Industrial psychiatry is a new development and its growth has been gradual. One hindrance has been that its aims have been widely misunderstood, partly because the early industrial psychiatrists had a limited conception of their functions. That is, their efforts were confined to improving methods of selection, placement and reassignment, and to studies of fatigue, ventilation, lighting, seating, etc. Moreover, the use of psychological testing gave disappointing results because the tests were used unwisely and over-optimistically.

The Hawthorne tests began to throw light on the defects of industrial psychiatry as it existed at the time, and to indicate that the mental health, mental attitude, and emotional stability of the worker were the most important factors to be considered. That is now generally realized, but the number of companies making use of psychiatry is still small. The functions and qualifications of the industrial psychiatrist are discussed at length. He should first of all be acceptable as a person; he should be able to mix with people and to work harmoniously with his superiors, subordinates, and all others. He should have had teaching experience and ability to teach, since much of his contacts will be with

groups. His training should include industrial relations, labor law, public health, psychology of group behavior, and methods of handling groups. He should be a member of the medical staff and should assist in training industrial physicians in basic psychiatry, and in training nurses in dealing with personality problems.

The attitude of labor unions is discussed. There is a growing appreciation of psychiatry on the part of the unions. While psychiatry does not offer a ready-made solution to industry's manifold problems, it can go far in assisting industry to a better understanding of the development of individual personality, motivation for work, and interpersonal relationships.

- 133 Examination of a Sales Force. H.G. Murray.
Ind. Med. & Surg. 20, 441-443, (Oct., 1951).

Members of a sales force are a very important part of any company's personnel and if factory or office executives are examined yearly as part of a preventive medicine program, it is only logical that the sales force also be given the opportunity to be examined. The plan is presented to show that at least a biennial health examination can be given to a scattered sales force as part of a preventive medicine and health conservation program in industry. -- Author's Conclusions

- 134 A Consideration of Basic Personnel Policies for Industrial Nurses.
Mildred I. Walker. Nursing World 125, 462-463, (October, 1951).

The author advocates written personnel policies for the nurse to follow. When a nurse considers a position in an industry, the personnel officer should outline the status of the staff of the health service in relation to the total personnel chart. The outline should include (1) to whom the nurse is responsible, (2) salary rates and opportunities; (3) hours of work, including emergency overtime; (4) security measures; (5) working conditions; (6) policies for selection of staff; (7) stability of employment; (8) vacations and leaves; (9) sick benefits and retirement plans including the nurse; and (10) service to uniforms.

Good personnel policies are flexible and should be renewed frequently. The lines of communication should be clearly defined. The nurse should be free to remain neutral and objective, and to avoid membership in an organization which would cause discrimination against any group of employees. In industrial relations the nurse needs wise guidance from management.

- 135 Hope for the Handicapped. E.A. Baker.
Natl. Safety News 64, 98, 99, 175-178, (Oct., 1951).

The author, who became blind and was trained at St. Dunstan's, in England, came to Canada, where he and other blind persons helped to

establish the Canadian National Institute for the Blind. He describes the rehabilitation program of that organization, and gives a number of examples of the restoration of handicapped persons, especially the blind, to useful activities.

- 136 Department Manned 100% by Handicapped Workers Pays Off.
Anon. Factory Mgmt. & Maint. 109, 106, (August, 1951).

Every worker in one production department of Solar Aircraft Co., San Diego, California, is physically handicapped. This is a marked departure from the practice of spreading the handicapped thinly over the plant. The output of the department is above average. The employees have had no lost time accidents in the eight months of operation, and absenteeism is below the plant average. Leg handicaps are the most common type among the 25 workers. There is no "pampering." The workers are expected to do a full day's work with standard machines and equipment. Regular job training methods are used, and foremen follow-up the progress of the workers.

- 137 Mobilizing the Physically Handicapped for Defense. Symposium.
Employment Security Rev. 18, 3-32, (September, 1951).

A number of authors have contributed papers dealing with various phases of employment of the handicapped. They all bring out points to support the principle that the handicapped must have their place in industry, especially in the defense program. F. Cowing, in his paper on "Management's Handicap" says: "Management does have a serious handicap, you know. Management, by its own standards, would be unemployable, because it is both lazy and blind. It is lazy because it will not take time to interview members of the Bureau of Vocational Rehabilitation, and because its members hide behind useless dodges."

Four papers under the heading "They Stay Placed" provide examples of successful employment of disabled persons.

- 138 Increased Employment of Older Workers Needed. S.H. Slichter.
Wisconsin Labor (Wisc. State Federation of Labor) (1951). Abstract,
Mgmt. Rev. 40, 612-613, (October, 1951.)

In 1890, about 68.2% of males of 65 years or over were in the labor force; in 1950 the proportion was 45%, largely because of retirement practices. If the proportion were raised to 60%, the output of the country would be raised over 1.1%, with a corresponding increase in the standard of living. The growing proportion of older persons in the population will increase the burden of supporting them. The percentage of persons over 65 who are capable of working is as high now as it was in 1890, and the

proportion of jobs that they could do is increasing. Therefore, three out of five should be in the labor force today. Their employment would not mean fewer jobs for younger workers; rather the volume of employment in subsequent years will tend to be higher. Three suggestions are made for increasing the employment of older workers; (1) raising the retirement age; (2) encouraging the spread of piece work; and (3) a subsidy whereby employers would be paid one-fifth to one-fourth of the annual earnings (say up to \$3600) of all workers kept beyond the stipulated ages.

- 139 Socio-Economic and Public Health Aspects of the Aging Process.
C. Tibbitts. Am. J. Pub. Health 41, 944-949, (August, 1951).

Employment of elderly persons is one of the subjects included in the discussion. Employment of older people is important for at least three reasons: (1) it satisfies their need for financial security; (2) it maintains their status as income producers rather than financial dependents; and (3) it takes advantage of their capacities as producers of goods and services. The last is of special importance in the present situation. The problem of employability calls for much basic information which will require long study, but in the meantime data can be obtained on absenteeism, accidents, productivity, and job performance. Several companies are experimenting with retirement plans, involving periodic consideration of the capabilities of individual workers and their retirement on the basis of service record, physical status, productive capacity, and value to the company. Preparation for retirement is another field now being explored.

- 140 A Survey of Accident and Health Coverage in the United States. Health Insurance Council, Room 800, 488 Madison Avenue, New York 22, N. Y., 24 pp., (September, 1951).

Statistics on number of persons having hospital, surgical, and medical coverage, respectively, are tabulated, with classification as to type of insurance--group, individual, Blue Cross and medical society, and independent plans. The growth of hospital and surgical coverage over the last ten years is also portrayed graphically.

In the totals, allowance is made for duplication on the basis of the best information available. The number of persons with hospital coverage has risen from 12 million in 1940 to 76 million in 1950, and the number with surgical insurance has increased from 5 million to 54 million. In the northeastern United States, over half the population has voluntary hospital protection.

In the predominantly rural sections, the percentage is smaller, but protection is being rapidly extended in those areas. Methods of obtaining the data are explained.

- 141 Medical-Care Insurance for Industrial Workers. W.J. Lear.
Monthly Labor Rev. 73, 251-257, (September, 1951).

The author briefly reviews developments in medical-care insurance prior to 1950, summarizes statistics on the extent of various types of plans as they existed in 1950, and discusses future problems and prospects. Among the problems are change of employment, temporary unemployment, and retirement in relation to continuity of coverage. The author quotes several statements of opinion on medical-care insurance, and concludes: "The principal types of voluntary medical-care insurance plans now in operation appear to be both adequate and flexible enough to meet most of the current stipulations of management and labor. In the absence of new factors, it can be expected that the trend to use these existing plans will continue. As at present, they will be financed only occasionally by the workers alone, often jointly by the employer and the workers, and, with increasing frequency, by the employer alone."

- 142 Health and Welfare Plans in the Automobile Industry.
E.K. Rowe. Monthly Labor Rev. 73, 277-282, (Sept., 1951).

At least 90% of all workers in the automobile industry are under some type of collectively bargained health and welfare program. Statistics on the scope of 63 programs are presented. They all include weekly accident and sickness insurance; 99% of the 682,500 workers have life insurance coverage; 97.5% have hospital and surgical benefits; 91.5% have medical benefits; and 69.2% are covered for accidental death and dismemberment. Financial provisions of the plans, participation requirements, extended coverage provisions, types of benefits, and other detailed features of the plans are discussed.

- 143 The UAW-CIO and the Problem of Medical Care. H. Becker.
Am. J. Pub. Health 41, 1112-1117, (September, 1951).

The author feels that the present hospitalization and medical insurance organizations do not yet meet the needs of the low-income worker. He states that the future development of medical services for industrial workers is not clear, but that some organizations such as the New York Health Insurance Plan and the Permanente Health Plan, have elements of a satisfactory community pattern. He believes that part of the funds for adequate welfare programs must come from taxation, and that the public will demand greater voice and participation in policy decisions, as members of boards or as voters.

He concludes that the standard of hospital and medical services within the next decade will require universal prepayment covering the entire cost of comprehensive medical service.

ACCIDENTS AND PREVENTION

- 144 Injuries and Accident Causes in the Manufacture of Clay Construction Products. Bull. 1023, U.S. Dept. Labor, Bur. Labor Statistics. 49 pp., (April, 1951). For sale by Supt. of Documents, U.S. Govt. Printing Office. Washington 25, D.C., Price \$.30.

This report gives a detailed analysis of the hazards of this industry, and of injury rates for 1948 according to region, plant size, and operating departments. A brief summary of rates for 1949 shows the lowest figures since 1940, but the frequency rate for the industry remains high. A number of typical accidents are described briefly with recommendations for avoiding similar cases.

- 145 Tests for Safety Clothing. J.A. Dickinson. Natl. Safety News 64, 24,25,98, (November, 1951).

The author suggests a number of tests for various kinds of safety clothing, including shoes, fireproof clothing, high-voltage equipment, and hard hats. He presents the following principles for selecting tests: (1) maximum protection should be provided within the limits of wearability; (2) the device or article should either be designed for maximum protection or should be available in different forms or grades for the groups using them; (3) tests should simulate factory or field conditions as closely as possible; and (4) user's reactions should be checked, and the basic specifications and test procedure should be modified to secure a product that will prove satisfactory in actual use.

- 146 Dust Explosions in Factories. S.H. Wilkes. Abstract. Coll. Guard. 183, 513-516, (November 1, 1951).

All organic material should be assumed to form explosive dusts in the absence of positive knowledge to the contrary. In general, 0.02 ounces per cu. ft. of air is assumed as the lower explosive limit, but the upper limits have not been determined with certainty. Inorganic materials whose dusts are explosive include magnesium, aluminum, iron and its alloys, sulfur, and others not used extensively in industry. Dusts occur most frequently in the milling industries, those using powders or flours, and the polishing industries.

Locations where explosive dusts may occur in a plant are numerous, and are discussed extensively; in the mill, in ducts, in cyclones and bag filters, in bucket elevators, and in screens conditions may arise

dispersing the dusts. An explosion in any such place usually bursts the casings and blows the flaming dust into the workroom. It is difficult to guard against all possible sources of explosion, but a number of precautions can be taken, including: keeping equipment dust-tight; blast-proof enclosures; use of exhaust hoods around openings; provision of sleeves or troughs for falling dust, use of relief panels, doors, and precautions against ignition.

Sources of ignition are smoking, sparks from metal contacts, static electricity, and spontaneous combustion. Pneumatic separation of heavy metals is advocated. Other preventive methods that have only limited applications are wet grinding, chilling, use of inert gases, and subdividing the operations into small units.

- 147 Explosive Characteristics of Hydrogen Peroxide Vapor. C.N. Satterfield, G.M. Kavanagh and H. Resnick. *Ind. Eng. Chem.* 43, 2507-2512, (November, 1951).

At atmospheric pressure, vapors containing 26.0 mole per cent or more of hydrogen peroxide can be exploded by initiation with a hot wire or spark gap. The ignition limit increases to 33 mole per cent hydrogen peroxide at 200 mm. of mercury total pressure and to 55 mole per cent at 40 mm. Vapors lying within the explosive composition region at one atmosphere total pressure may be exploded by contact with catalytically active materials initially at room temperature or by "noncatalytic" materials like aluminum at 150°C. or higher. The results of the investigation are of practical importance wherever hydrogen peroxide solutions may exist at elevated temperatures.

- 148 Accidents Caused by Manipulating Perchloric Acid and Perchlorates. H. Moureu and H. Munsch. *Arch. Malad. Profess.* 12, 157-161, (1951). (In French).

Attention is called to dangers inherent in the use of perchloric acid and its salts. When this acid is used with nitric or sulfuric acid or both to destroy organic matter in the laboratory, violent explosions are likely to occur. Ventilating hoods made of wood readily become inflammable. The use of the acid with anhydrous acetic acid industrially for polishing metals is especially dangerous; in one instance, 15 persons were killed and 200 injured, owing to a temperature rise during the operation. Alkaline perchlorates are explosive; ammonium perchlorate, when associated with such organic matter as dinitrotoluene or castor oil, is highly explosive. Perchloric acid forms salts with metallic amines which detonate when heated. Pyridine perchlorate has recently caused two serious accidents; a blow from a hammer may detonate it. Probably a number of minor explosions are not reported. Accidents with perchlorates can be attributed only to negligence.-- Cond. from Bull. Hyg.

- 149 Safe Handling of Ammonia Solutions. H.R. Krueger.
Agr. Chemicals 6, 46, 47, 111, 113, (November, 1951).

Anhydrous ammonia, ammonia "B" liquor, ammonium nitrate-aqua ammonia, and urea-aqua ammonia solutions are now in common use in commercial fertilizer plants throughout the United States. The author calls attention to the hazards involved and recommends safety measures, which are neglected in many plants.

Among the recommendations are: numerous precautions in loading and unloading tank cars; approved respiratory equipment; protective clothing; emergency equipment, including safety showers; bubble-type drinking or eye-wash fountains, stretchers and blankets. Because of the high vapor pressure of anhydrous ammonia, the various solutions are in general use. Tanks, pipes and fittings for these solutions are fabricated of stainless steel, aluminum, or black iron. Copper must be avoided, and compressed air is generally used rather than pumps for transferring.

It must be remembered that 15 to 20% concentrations of ammonia gas are flammable. Inculcation of safety habits in employees is an important factor in safe handling.

- 150 Make Your Spray Room Safe. Anon.
Occ. Hazards 13, 17-18, 52, (Sept., 1951).

Fires have occurred in spray rooms on account of neglect of safety precautions. The causes were spontaneous combustion (46%), defective electrical equipment, cutting and welding nearby fan friction, smoking, open flames, and miscellaneous spark sources. A number of pointers on safe operation are given, including adequate floor drains, ventilation by fans or use of a standard spray booth, safety switches, automatic sprinklers, safety cans for flammable substances, and safety construction of the booth.

MISCELLANEOUS

- 151 The Hazards of Rope Making. J.A. Smiley.
Brit. J. Ind. Med. 8, 265-270, (Oct., 1951).

The main processes where hazards occur in the manufacture of cordage are described. These hazards include a condition which resembles byssinosis, the various skin lesions associated with the use of tar and tar-oils, nerve deafness amongst plaiters similar to boiler maker's deafness, tenosynovitis or peritendinitis crepitans among braiders, and various types of accidents. It is indicated that the industry, because of its history has been in the past very conservative, but that active steps are now being taken in an attempt to control the various hazards.

-- Author's Summary

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