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Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL -- decisions and trends

FEBRUARY 1948

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INDUSTRIAL HYGIENE FOUNDATION

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FOUNDATION FACTS

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

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Twelfth Annual Meeting Transactions Published

The official Transactions for the 12th Annual Meeting of Members of Industrial Hygiene Foundation, held at Mellon Institute, Pittsburgh, on November 20, were published late in February and mailed to Members and Subscribers.

This pertinent bulletin, entitled "A Better Place to Work," includes the pointed keynote address by William B. Given, Jr., President of American Brake Shoe Company, which has attracted such wide attention. More than 5,000 copies of the address have been distributed to date and it has been reprinted in a number of journals. Other subjects of immediate interest in the Transactions include:

COMMUNITY ATTITUDE ON WORKING CONDITIONS; RESULTS OF FOUNDATION FIELD RESEARCH; INDUSTRIAL HEALTH PROGRAMS IN ACTION; SUMMARIES OF CONFERENCES held in connection with the annual meeting; INDUSTRIAL HEALTH ADMINISTRATION; ATOMIC POWER AND INDUSTRY; SICKNESS INSURANCE; and, HEALTH AND WELFARE FUNDS UNDER THE TAFT-HARTLEY ACT.

Review of Flu Vaccination Experience

A report on "Results of Influenza Vaccination in Industry During the 1947 Epidemic," prepared by Anna M. Baetjer, Sc.D., of the Johns-Hopkins University, was issued by the Foundation recently. This material was made available to the Members in advance of publication through the courtesy of Dr. Baetjer. It will be recalled that she made an important presentation on the subject of influenza at the 1946 annual meeting. (See Health in Industry, Transactions, 11th Annual Meeting.)

Foundation Committees Plan Meeting

The Foundation's MEDICAL COMMITTEE, of which Dr. A.J. Lanza is Chairman, will hold an all-day meeting in New York on March 10. The agenda includes plans for a number of the Committee-sponsored activities of benefit to Foundation Members.

The CHEMICAL AND TOXICOLOGICAL COMMITTEE is holding a luncheon meeting in Boston late in March in connection with the annual meeting of the Industrial Physicians and Surgeons and the Industrial Hygiene Association. The Foundation's LEGAL COMMITTEE is planning to meet in New York on May 6.

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Hatch Named Chairman of Two National Committees

Theodore F. Hatch, the Foundation's Research Director, was recently appointed to the National Research Council's Committee on Sanitary Engineering and Environment. He will serve as Chairman of the sub-committee on Industrial Hygiene. Meanwhile, Mr. Hatch has also accepted the chairmanship of the Committee on Safety Codes and Exhaust Systems of the American Standards Association.

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INDUSTRIAL HYGIENE DIGEST
Literature and News

News Items

108 President Asks \$6,000,000 for Industrial Safety.

Appropriations of \$6,000,000 for grants to States through the Department of Labor for an industrial safety program and \$1,000,000 for a proposed National Commission Against Discrimination in Employment were requested in President Truman's budget message submitted to Congress on January 12. The President has proposed legislation authorizing both of these new programs, which is pending before the Congress. The budget message proposed over-all labor appropriations of \$99,670,300 for the fiscal year starting next July 1, as compared with \$85,300,401 this year and \$140,000,000 in fiscal 1947. This includes Children's Bureau and War Services, now discontinued.

-- Labor Information Bull. (Feb., 1948)

109 New Jersey Labor Department Adopts New Code.

Rules and regulations prescribing "Maximum Allowable Concentration Limits of Harmful Vapors, Gases, Fumes, Mists, Dusts and Radiant Energy for Places of Employment" have been adopted by the New Jersey Department of Labor. The Code became effective December 15, 1947. Copies may be secured from C. George Krueger, Director, Division of Engineering and Safety, New Jersey Department of Labor, State House, Trenton 7, N.J.

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110 Dr. Scheele to Succeed Dr. Parran in Public Health Service.

The White House has announced the nomination of Dr. Leonard A. Scheele as Surgeon General of the U.S. Public Health Service, to succeed Dr. Thomas Parran when the latter's term expires April 6, 1948. Dr. Scheele was born in Indiana, received his A.B. degree from the University of Michigan and his M.D. from Wayne University, Detroit. He was commissioned in the Public Health Service in 1934. From 1946 to 1947, he was assistant chief of the National Cancer Institute of the National Institute of Health and in July 1947 he became assistant surgeon general of the U.S. Public Health Service and director of the National Cancer Institute. Dr. Parran was appointed Surgeon General in April 1936 and reappointed in 1940 and 1944. He has been

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a commissioned officer in the Public Health Service since 1917. Previous to his assignment as Surgeon General, he had served in 14 states on public health research and administrative assignments and from 1930 to 1936 as commissioner of health for the state of New York. In a statement Dr. Parran said, among other things, that "the President is to be congratulated on his appointment of Dr. Leonard A. Scheele as Surgeon General of the U.S. Public Health ServiceI have no plans for the future. I shall be at the disposal of my commander in chief and the new Surgeon General." -- J.A.M.A. (Feb. 21, 1948)

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Three Foundation Members Announce New Medical Facilities, Personnel.

F.W. Mumper, Director of Personnel Relations, Jones and Laughlin Steel Corporation, announces that Dr. S.A. Norris has been appointed Chief Surgeon For the Jones and Laughlin Steel Corporation, succeeding Dr. H.E. McGuire, retired. Dr. B.L. Jones will assist Dr. Norris with all Jones and Laughlin medical cases that are consigned to the South Side Hospital.

A new hospital and medical department occupies 11 rooms on the third floor of the Pittsburgh plant of the Mine Safety Appliances Company. A lead-lined x-ray room, a laboratory, physiotherapy room, a two-bed infirmary for women workers, and general treatment rooms and offices are provided. Dr. B.A. McAleer is Medical Director and the staff consists also of two registered nurses and a secretary. -- Ind. Med. (Dec., 1947)

Sylvania Electric Products announces the appointment of Dr. Harry Tebrock as Medical Director of the Company. Dr. Tebrock comes to Sylvania from the Schenley Laboratories, prior to which he was a Commander in the U.S. Navy. While on military duty he flew around the world eight times. He was in charge of the first administration in combat of penicillin in the Pacific Area. Dr. Tebrock took the only official medical history done photographically of medical aspects of the war. He took part in the invasion of Tarawa and the Battle of the Bulge. Although sent as an observer, the casualties at Tarawa were such that he entered the operation room where he worked for 85 straight hours. At Sylvania Dr. Tebrock will report to Gerry E. Morse, Director of Employee Relations.

The U.S. Department of Labor, Bureau of Labor Statistics, Announces Publication of a Study "Hours of Work and Output."

This bulletin, No. 917, deals with production, efficiency, absenteeism, and accidents under different work schedules. Findings are based upon 78 case studies, which are described in detail. "The answer supplied by this survey is that there is no such thing as an optimum workweek. Workers perform differently under identical schedules of hours because of a variety of factors: the incentive to produce; the physical demands which the job makes upon them; the degree to which they control the work pace; the conditions under which they work; whether they work on day, evening, or night shift; whether or not, and how frequently, shifts are rotated; and--less tangibly--whether their relations with management are cordial or otherwise."..The study indicates that, everything else being equal, the 8-hour day and the 40-hour week are best in terms of efficiency and absenteeism. Injuries increased as hours increased." (Copies of this report may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., at 35 cents per copy.)

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113 Course in Industrial Hygiene Toxicology.

The University of Pittsburgh School of Medicine, Department of Industrial Hygiene, announces an afternoon course in Industrial Hygiene Toxicology, two hours weekly, for two credits. The instructor is Dr. P.L. Beebe, Director of the Industrial Hygiene Laboratory of the above Department.

114 General Hawley to Direct Blue Shield and Blue Cross.

Major General Paul R. Hawley, who developed the medical program of the Veterans Administration, and headed the Army's medical services in Europe during the last war, has been named chief executive of the national organizations of non-profit Blue Shield medical service plans and Blue Cross hospital service plans. He will assume his duties April 1 with headquarters in Chicago.

-- Pgh. Med. Bull. (Feb. 7, 1948)

115 Chest X-Rays.

Chest x-ray examinations are now required of civilian employees of the naval shore establishment, whenever practicable, including preemployment, at least annually, and on leaving the employ, according to Circular Letter No. 47-170 of the Navy's Bureau of Medicine and Surgery.

-- Safety Rev. (Jan., 1948)

116 "A Short Guide to Wise Eating."

The New York State Food Commission is presenting an educational and informational program to help consumers keep food budgets down, keep their health and vigor up, and still help provide enough food to at least prevent starvation abroad. Its nutritionists have prepared a series of leaflets, one of which is "A Short Guide to Wise Eating." (Copies are available from Dr. Leonard Greenburg, Executive Director, N.Y. Department of Labor, Div. of Industrial Hygiene, 80 Centre St., New York 17, N.Y.)

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Occupational Disease Statistics

Occupational Disease Statistics.

	Balt. ² Apr.- Dec. 1947	Ind. ² Jan. 1948	Mich. ² Jan. 1948	Ohio ¹ Oct. Nov. 1947	Wash. ⁴ Dec. Jan. 1947 1948	Wis. ² Dec. 1947	Totals
Abrasions	1						1
Anemia (x-ray exposure)		3					3
Brucellosis	11						11
Bursitis	1						1
Carbon Monoxide					1	2	3
Carbon Tetrachloride	1					1	2
Chemical Poisoning (N.O.C.)				15	2		17
Chrome Ulceration	2						2
Conjunctivitis					6		6
Dermatitis	73	26	39	650	95	45	928
Hernia			9				9
Infections					8	4	12
Inflammatory Conditions			3		34		37
Lead Poisoning	5			14	3		22
Mercury	1						1
Metal Fume Fever		1					1
Miscellaneous	11			230	10		251
Nasal Septum Perforation					8		8
Pneumoconiosis (exclusive of silicosis)			2	24			26
Pulmonary and Bronchial Affections					10		10
Silicosis	1	5	3	69	13		91
Silico-tuberculosis		1			3		4
Skin Diseases (other than dermatitis)				9			9
Tenosynovitis	9						9
Tuberculosis (due to contact)				7			7
Undulant Fever					1	2	3
Upper Respiratory Affections	4				4	2	10
Totals	120	36	56	1018	198	56	1484

- (1) Occupational Disease Cases reported to the Industrial Commission. There were 134,448 days lost, including one death reported from Chemical Poisoning (N.O.C.), 15 deaths reported from silicosis, one death reported from Pneumoconiosis and one death reported from a miscellaneous cause.
- (2) Occupational Disease Cases reported to the Health Department.
- (4) Occupational Disease Cases reported to the Department of Labor and Industries and tabulated by the Department of Health. Figures reported by Washington as silicosis and silico-tuberculosis represent case reports received from other sources.

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Legal Developments

- 118 Resume of the Proceedings of the Fourteenth National Conference on Labor Legislation, December 9 and 10, 1947.

Safety and Health---Each state should provide: (1) a basic labor law providing safe and healthful workplaces; (2) leadership and assistance to management in development of accident prevention programs; (3) competent and uninfluenced personnel to assist in developing and enforcing safety and health regulations. These aims require the development of uniform safety codes, adequate training of inspectors, development of technical safety and safety engineering data. The Committee strongly recommends that protection of safety and health of workers is a labor department function. Workmen's Compensation---The following basic standards are urged as a minimum: (1) compulsory coverage of all workers, including farm, migrant, and domestic workers; (2) full and general coverage of all occupational diseases; (3) unlimited medical benefits; (4) establishment of second injury funds in all States; and (5) double compensation to injured minors illegally employed. -- Bull. 92, Division of Labor Standards, U.S. Dept. Labor. 56 pp. Report of the Committee on Safety and Health and Workmen's Compensation, pp. 29-32.

- 119 State Legislatures Convening in 1948.

California	New Jersey
Kentucky	New York
Louisiana	Rhode Island
Massachusetts	South Carolina
Mississippi	Virginia

Legislation respecting occupational disease compensation is expected to be enacted by some of these states. Any such developments will be summarized for member companies after the various sessions are adjourned.

- 120 Alleged Silicosis--No Proof of Exposure in Employment or of Disability.

The decision of the commission, that the claimant, a grinder of steel casings, had failed to prove that he was exposed to the hazard of occupational disease, or that he had contracted an occupational disease arising out of and in the course of his employment, or that he had suffered any disability, was supported by the evidence. -- American Manganese Steel Co. v. Industrial Commission. Illinois Supreme Court. Docket No. 30,236. January 22, 1948. (CCH)

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- 121 Quiet Tuberculosis Lighted up by Inhalation of Fumes---"Poisoning" under Pennsylvania Occupational Diseases Act.

The lighting up of a quiescent tubercular condition as a result of breathing fumes from a preparation containing halogenated hydrocarbon constituted a poisoning by chlorinated hydrocarbons within the meaning of the Pennsylvania Occupational Diseases Act, although it was termed not a "systemic poisoning" by a medical expert. -- Watkins v. National Elec. Products Corp. U.S. Circuit Court of Appeals, Third Circuit. No. 9383. Jan. 30, 1948. (CCH)

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Books, Pamphlets and Notices

122 The Industrial Environment and Its Control. J.M. DallaValle. Pitman Publishing Corporation, New York, N.Y. Price \$4.50. 225 pp. (1948)

A thorough introduction to the problems of engineering design in industrial hygiene. The book is directed at those physical aspects of the environment which allow engineering analysis, such as psychrometry, heat, noise, and industrial ventilation, including measurement of air flow, system design and operation of equipment. Each subject is presented in the light of basic theory and developed clearly to show its application to everyday plant problems. The usefulness of the book as a practical tool in engineering work is greatly enhanced by the problems presented under each topic and worked out step by step. Smaller sections of the book describe in considerably less detail the essential features of industrial hygiene and sanitation as related to toxic materials, maximum allowable concentrations, medical facilities and other matters. Of necessity, the book depends heavily on mathematics and many will appreciate Mr. DallaValle's presentation of underlying theory. However, the book never becomes removed from practical considerations and much of its largest section. Heat, for example, is concerned with the relationships developed from experimental work. In general, it represents an excellent course of instruction for those concerned with design beyond the routine, and for all it offers a comprehensive survey of the multitude of factors to consider in the application of hygienic measures to plant operation.

123 Micromeritics. The Technology of Fine Particles. J.M. DallaValle. Second Edition. Pitman Publishing Corporation, New York, N.Y. Price \$8.50. 555 pp. (1948)

The first edition of Micromeritics received wide acclaim for it filled a need for a single reference volume which would bring together the results of research on the properties and behavior of fine particles from many unrelated fields. The second edition includes five new chapters and extensive re-writing and re-arrangement of the original text. The 23 chapters fall into three main groups: methods of size analysis, basic physical and chemical properties of fine particles and application to the study of behavior of particles under various conditions of stress in nature and in practical engineering problems. The treatment is mainly mathematical and will be difficult reading for those who are not using mathematics regularly. The effort required will pay for itself, however, since the book contains so much information of practical value which, heretofore, was scattered through the literature. No one directly concerned with the technology of fine particles should be without this second edition of Micromeritics.

124 Heating and Ventilating's Engineering Databook. C. Strock. Industrial Press, 148 Lafayette St., New York 13, N.Y. 576 pp. Price \$7.00. (1948)

A 576-page volume of reference tables, charts and text has been published by The Industrial Press under the title Heating and Ventilating's Engineering Databook, by Clifford Strock. The data are organized into ten

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sections---Heat and Moisture in Air, Fuels and Combustion, Piping, Air Handling and Ventilation, Heating and Heat Transmission, Cooling and Air Conditioning, Motors and Drives, Contract Law, Mathematical Data and Drafting Room Practice, and Terminology.

Industrial Medical Practice

- 125 Physiological Tests in Silicotic Dyspnea. M.J. Andre.
Bruxelles-Med., 26, 1493-1503, 3 figs., (Dec. 8, 1946)

This paper contains a review of a number of recent methods for assessing pulmonary efficiency which may be of use in silicotic states. These are (a) pulmonary circulation time, (b) the effect of broncho-constrictor and bronchodilator aerosols on vital capacity, (c) the effect of muscular effort on alveolar carbon dioxide, oxygen debt, vital capacity and ventilation index.

-- Bull. Hyg.

- 126 Silicosis and Metalliferous Mining in England.
Brit. Med. J., p. 743 (Nov. 16, 1946)

The decennial supplement of the Registrar General of England reveals that the occupation with the highest standardized mortality ratio among males 20 to 65 is "tin and copper mining below ground." The third highest is "other metalliferous mining below ground," and the fifth is "slate mining and quarrying." The development of silicosis is often insidious, but the onset of symptoms is often abrupt. The immediate cause of death is often congestive heart failure or bronchopneumonia. During the past 15 years, medical supervision under the direction of Craw has been carried out in the hematite miners in Cumberland, with great success. He claims that no miner who has entered the mines in that period has developed any signs of dust diseases of the lungs. This has been achieved by careful selection of the men, repeated examination and routine chest skiagraphy. Early cases of tuberculosis are identified and removed. -- Am. Rev. Tuberc.

- 127 Importance of Bronchial Lesions in Patients With Pneumoconiosis.
W. Bruninx. Acta clin. belg., 1, 536 (Nov.-Dec., 1946) (French)

Bruninx points out that many attribute dyspneic functional disturbances in pneumoconiotic patients to pulmonary fibrosis, pulmonary emphysema or cardiac disturbances. He admits that these factors do play a part but thinks that certain bronchial factors have been neglected. Three kinds of bronchial abnormalities are revealed by bronchoscopy of silicotic patients, namely bronchial catarrh, big spurs that reduce the bronchial lumen and bronchial spasms. Repeated bronchial aspiration and application of epinephrine hydrochloride to the bronchial mucosa result in prompt improvement in spasms and catarrh but exert no influence on the spurs. The fact that these therapeutic measures cause a decided and prolonged improvement in the dyspnea proves the great importance of bronchial lesions in patients with silicotic dyspnea.

-- Occ. Med.

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- 128 Tuberculosis and Industrial Employment. A Code of Fair Employment Practice and Guide for Industrial Physicians. O.A. Sander. Ind. Med., 16, 577-580 (Dec., 1947)

Selective placement of tuberculous individuals in industry demands that the industrial physician should, to the best of his ability, estimate the possible future course of each case, taking into consideration the environmental factors in the industry under consideration. This requires thorough knowledge and experience with tuberculosis, a complete understanding of the special hazards in the plant and the effect of such hazards on tuberculous lesions. The inexperienced physician tends to reject more workers than necessary. The patient should be impressed with the importance of adequate rest outside of working hours.

-- From Author's conclusions

- 129 Tuberculosis in Industry. C. Lanardonne. Med. Bull. (Stand. Oil, N.J.), 7, 62-71 (Oct., 1947)

Tuberculosis is not an occupational disease, but its incidence is influenced by fatigue, malnutrition, and possibly traumatism when it can reactivate a previous latent lesion. Recommended supervision and protective measures include case finding, care of proven cases, search for foci of infection, and constant control and supervision of personnel. In the company's practice, when an examination discloses tuberculosis, the employee is notified and persuaded if possible to go to a hospital or sanitarium. Benefits are prolonged sufficiently to permit estimation of progress of the condition and, if feasible, to obtain arrest of the process. The case remains under the control of the physician. The workman is authorized to return to work when the condition is arrested; that is, six months to a year after symptoms have disappeared.

- 130 Some Uses of Radioactive Isotopes in Medicine. H.L. Alt and J.A.D. Cooper. Ind. Med., 16, 583-585 (Dec., 1947)

The uses of radioactive phosphorus, radioactive iodine and radioactive sodium in the treatment of disease are reviewed. The authors conclude that "the nature of the effects produced in living tissues by radiation from isotopes during their decay makes it necessary to predicate any clinical applications on long term observations and evaluation of methods." They consider that the most promising use of radioactive substances has been in the field of biological research.

- 131 Serological Tests for Industrial Workers. W. Clarke. Ind. Med., 16, 567-569 (Dec., 1947)

A review is presented based on questionnaire studies and field studies indicating that there has been substantial progress since 1933 in dealing with syphilis as a health problem of industrial workers.

-- Author's summary

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- 132 Inhibition of Formation of the Intrinsic Factor of Castle and its Physiological Consequences. M. Lourau. Bull. soc. chim. biol., 29, 44-49 (1947)

The anemic effect of chronic lead poisoning appears to be the result of inhibition of an enzyme system concerned in the production of the antianemia factor within the body. This enzyme system is located in the tissues of the gastro-intestinal tract. The gastric factor (intrinsic factor of Castle) is the immediate precursor of the antianemic factor. Lead acetate does not produce anemia in rabbits if the gastric factor or the antianemia (liver) factor is administered concurrently. - -- C.A.

- 133 Proteinuria and Kidney Injury Among Workmen Exposed to Cadmium and Nickel Dust. L. Friberg. J. Ind. Hyg. and Tox., 30, 32-36 (Jan., 1948)

On the examination of 19 workmen who had been exposed to cadmium and nickel dust for more than eight years, proteinuria was found in 18 cases. No proteinuria was found among 19 patients who had been similarly exposed during a period of a year or two. At least three components were involved in the protein. In 14 cases, impaired kidney function was observed. The blood of eight workers with proteinuria was examined polarographically. Pathologic changes were found in all of these cases. These changes implied the possibility of the occurrence of low molecular protein which is not found to be present among healthy persons. Similar pathologic changes have not hitherto been reported in the literature. Animal experiments as well as protein chemical investigations are being carried on in order to elucidate more closely the changes and their etiology. -- Author's summary

- 134 Argyrosiderosis of the Lungs in Silver Finishers. H.J. Barrie and H.E. Harding. Brit. J. Ind. Med., 4, 225-228 (Oct., 1947)

Changes in the lungs are described in four necropsies on silver finishers. The uniformity of the cases establishes the pattern of histological findings in the lungs after inhalation of iron oxide and silver dust. The iron oxide is inert and produces no interstitial fibrosis when taken by phagocytes into the lymphatic system. Inhaled silver dust obviously has a great affinity for the elastica of the alveolar walls and the smaller pulmonary vessels, and the large amount of the elastic tissue in the lungs explains why the silver does not readily gain access to the skin and kidneys, which are the usual sites of deposition when argyrosis occurs from ingestion of silver. All the cases described had considerable emphysema, but its relation to silver impregnation is speculative.

-- From Authors' summary and discussion

- 135 Control of TNT Sickness in Industry. W.E. Park. Canad. Med. Assoc. J., 58, 19-22 (Jan., 1948)

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The writer describes a project for the control of TNT sickness in a shell-filling plant during the latter years of World War II. The incidence of the sickness was so high that it was hard to keep sufficient men at work in TNT and the medical services were hard pressed. When Dr. Park began his work he found that the medical consultations amounted to 250 patients' visits per week. In one and a half years this number was reduced to an average of two cases per month. His first step was to assume authority for all health

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problems relating to TNT. He personally saw every patient and became familiar with every process and every health hazard where TNT was used. Nurses were also required to visit TNT areas and see every worker every day. The doctor took full control of the transfer of TNT workers for health reasons. Other features of the program were: employment of only the Grade A physically for TNT work; routine monthly physical examinations; payment of higher wages to TNT workers; improvements in ventilation, housekeeping and personal cleanliness. The writer credits the success of the project to the "splendid teamwork of the medical and nursing staff and the excellent cooperation of the operating staff." The enforcement was wholly by management on the doctor's recommendation.

- 136 The Diagnosis of Trichloroethylene Toxicosis.
S. Forssmann and A. Ahlmark. Nord. Med., 30, 1033-34 (1946)

The degree of exposure to trichloroethylene is easy to determine by means of the pyridine-alkali reactions upon urine. Methods for quantitative analysis have been worked out. Without this analysis a diagnosis of trichloroethylene toxicosis might be difficult. Moreover, the urine analysis can constitute a valuable control of the worker's protective measure and also considerably facilitate the sanification of factories and workshops as far as trichloroethylene is concerned. -- C.A.

- 137 Pathological Aspects of Atmospheric Blast Injuries in Man.
H. Cohen and G.R. Biskind. Arch. Path., 42, 12-34 (1946)

An account is given of the pathological findings in 11 cases of death following blast injuries. The principal and characteristic lesion found was widespread traumatic hemorrhage of the lungs, involving all lobes. In addition, in most cases, there were intense edema of the lungs and vesicular emphysema; in two cases interstitial emphysema was also noted. The bronchioles in some cases showed loosening or detachment of their epithelial lining, with edema fluid, red cells, and leucocytes extravasated into the injured bronchiolar walls. Extrapulmonary lesions were inconstant and took the form of focal hemorrhages into the organs affected, with occasional small lacerations of the tissues. In one case there was a rupture of the wall of the sigmoid colon. Six patients were burned, but the burns were not considered to have played any part in the production of the pulmonary lesions. -- Brit. Absts.

- 138 Fatigue States. Their Effect on Individuals and Industry. S.A. Portis.
Nat. Safety News, 57, 26-28, 84-87 (Feb., 1948)

The author presents evidence that a large proportion of cases of fatigue are due to sugar deficiency, although related directly to emotional origin. The production of insulin is stimulated both by the presence of sugar in the blood and by the action of the brain through the vagus nerve. Emotional disturbances enhance this action of the brain. The body reacts to a disturbed sugar balance by withdrawing the affected person from additional activities, and this mechanism manifests itself as symptoms of fatigue. Sugar tolerance tests show a flattened sugar utilization curve in fatigued subjects as compared with normal subjects. Fatigued persons give a normal

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curve after the administration of atropine which paralyzes the vagus nerve. Fatigue symptoms disappear under the same treatment, and also after removal of a part of the vagus nerve. These experiments have led to a treatment for fatigue, consisting of administration of atropine and adequate diet including lunches between all meals. Free sugar should be omitted from the diets during treatment, as its effect is to reduce blood sugar rather than increase it. Mid-afternoon lunches are recommended for all workers as an aid to efficiency. The worker should realize that he must aid in his recovery. The treatment outlined should be administered only by physicians, because fatigue may also indicate other conditions, such as incipient cancer or tuberculosis.

- 139 Minor Injuries of the Eyes. F.W. Law. J. Social Ophth., 3, 3-14 (July, 1946)

The author describes the treatment of "black eye," commotio retinae, abrasion and laceration of the conjunctiva, foreign bodies, burns, and radiation injuries. Fluorescein should always be instilled to determine the extent of surface injury. The shape of the pupil and depth of the anterior chamber are the most reliable external signs of intraocular damage. Blood in the eye or a black pupillary reflex indicates a major injury. Whenever intraocular foreign bodies are suspected an x-ray examination should be made.
-- Am. J. Ophth.

- 140 Medicine in Industry. F.L. Vassallo.
Med. Bull. (Stand. Oil, N.J.), 7, 93-99 (Oct., 1947)

The elements of industrial medicine are presented, showing that it is but slightly related to private practice, except in general precepts, ethics, techniques and routine procedures. The four main phases of medicine in industry are: curative, preventive, constructive, and sanitation and hygiene. Its goal is the elimination of the first phase through development of the other three to make the first unnecessary. Maintenance of the same high ethical principles as in private practice is emphasized.

- 141 Refinery Medical Service. What Constitutes Practical and Efficient Medical Service. S.L. Goodrich, C.E. Allen, and R.C. Carrell. Med. Bull. (Stand. Oil, N.J.), 7, 27-36 (Oct., 1947)

The medical policy of Standard Oil of New Jersey includes dispensary care for the worker, emergency medical service, diagnostic aid, public health and plant sanitation, periodic inventories, nursing service at plant and home, and pre-placement examinations. Recommendations for personnel, space and equipment are made, all based on the experience of the authors and others. Photographs of a typical medical department are included.

- 142 Meeting Industrial Health Responsibilities. R.S. Bonsib.
Med. Bull. (Stand. Oil, N.J.), 7, 86-91 (Oct., 1947)

This is a general paper explaining the essentials of industrial hygiene. The author gives the following as the causes of intensified industrial hygiene problems: (1) production of new and unfamiliar toxic materials; (2) use of large quantities of toxic material formerly used only in small amounts; (3) reduction in air space per worker; (4) introduction of new

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machinery and new manufacturing processes; (5) constructing of new buildings; (6) location of plants in remote areas; and (7) most significant of all, the speed with which these changes have taken place.

- 143 The Value of Industrial Medicine in Tropical America. E.H. Payne.
Ind. Med., 16, 574-575 (Dec., 1947)

Medical care is a required part of every organization operating in the tropics. Money spent for such a program is repaid by increased labor supply and increased production. Selection of personnel unacquainted with the tropics must be done with care to avoid individuals unable to adapt themselves to the environment.

-- Author's conclusion

- 144 The Ophthalmologist and the Industrial Medical Director. J.S. Felton.
Trans. Am. Acad. Ophthalmol. and Otolaryngol. (Jan.-Feb., 1947)

In summary, it has been attempted to show the potential field available to the consulting ophthalmologist in industry. Through contact with the medical director in the larger industries, and with management directly in the plants of lesser size, the full program can be instituted, covering: (1) Efficient use of vision in industry; (2) Prevention and treatment of eye accidents; (3) Conservation of visual health, (a) visual screening, (b) occupational visual analyses, (c) repeat visual surveys; (4) Medicolegal ophthalmology, (a) relation to constitutional disease, (b) relation to occupational disease, (c) compensation, (d) protective insurance, (e) liability. A plea is made for the ophthalmologist to associate himself with industry for such an association, along with the efforts of the medical director, will result in: (a) a happier worker; (b) a healthier worker; (c) a more productive worker; (d) a lower absentee rate; (e) lower accident frequency and severity rates, (f) a lower employee replacement rate; (g) a higher worker morale; (h) better community relations; and (i) better health behavior of the generations to follow.

-- Author's summary

Industrial Health Hazards and Their Effects

- 145 The Dust Hazard in Tremolite Talc Mining. L. Greenburg.
Yale J. Biol. & Med., 19, 481-501 (Mar., 1947)

A study of the tremolite talc mining and milling industry in northern New York State is reported. This talc is of the asbestine variety, mingled with tremolite and anthophyllite, and consistently reveals a free silica content of 1% or less. In mining the dust, counts ranged from 6 to 5,000 million particles per cubic foot, and in milling from 20 to 215 million particles per cubic foot. In a group of 221 tremolite talc miners and millers advanced fibrosis was found in 14.5%, all of whom had worked in tremolite talc for at least 10 years: of those working this length of time the incidence is reported as 29.9%. The fibrosis was fine, diffuse, and appeared granular or nodular and hazy on x-ray. It tended to be disabling and was frequently accompanied by dyspnea, cough, and fatigue. There

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appeared also to be increased susceptibility to tuberculosis; clinically significant tuberculosis was discovered in three of 18 cases of tremolite talc fibrosis having no other history of dust exposure. 6.3% of all the workers revealed non-symptomatic deposits of opaque material, designated as "talc plaques," at the periphery of the lungs. Thus, tremolite talc constitutes a silicate dust capable, like asbestos, of causing a disabling pneumoconiosis. It thus must be considered a definite industrial hazard requiring control by suitable engineering methods.

-- J.I.H.&T.

- 146 Dust Concentrations in Bolivia's Mines. B.D. Tebbens.
Am. Ind. Hyg. Assoc. Quart., 8, 38-41 (June, 1947)

Tables of dust concentrations occurring during drilling, mineral transfer, mucking, and blasting are presented. An average of 539 M.P.C.F. was found during dry machine drilling and 26 M.P.C.F. in wet drilling. In mineral transfer the figures are 14 M.P.C.F. in wet areas and 130 in dry; in machine mucking 52, and hand mucking 14. Besides wet operations, forced ventilation is recommended.

- 147 Bronchial Catarrh in Anthracosilicosis. J. Berard, L. Roche, and L. Ode.
Arch. d. mal. profess., 7, 251 ff. (1946) (French)

Bronchial catarrh is frequent among persons with silicosis and may provoke serious dyspnea and cyanosis. The symptoms may disappear quickly without serious consequences and without influence on the silicosis itself. In some cases, bronchitis initiates functional troubles, weakness of the heart, edema and anasarca. In other cases the silicosis becomes quickly progressive.

-- From Occ. Med.

- 148 Asbestosis of the Lungs. Luton, Champeix and Faure.
Arch. d. mal. profess., 7, 299 ff. (1946) (French)

A review of the literature reveals no previous cases of asbestosis in France, but the authors have seen several cases in a factory in which asbestos is used, and in which they make regular examinations. Details are given in one case of a man of 64, exposed to concentrations of 48 to 62 mg. of dust per cubic meter, total silica 40%, and free silica 4.3 to 14.6%. Complaints of weakness, dyspnea, coughing, and loss of weight were noted in 1943. Thoracic expansion was 2 cm. In the sputum asbestosis bodies were found but no tubercle bacilli. Roentgenography showed much more fibrosis than usual in the lower third of the lungs. During the next two years the symptoms became more severe.

-- From Occ. Med.

- 149 Methyl Chloride Intoxication at Baytown Refinery. R.W. Pipkin and T.S. Howell. Med. Bull. (Stand. Oil, N.J.), 7, 129-138 (Oct., 1947)

The history of methyl chloride poisoning is related briefly; in 1928-29 Kegel, McNally and Pope reported 29 cases. The insidious nature of the poisoning and lack of unpleasant odor of the gas has probably led to many other undiagnosed cases. In the company's butyl rubber plant, 61 cases occurred, beginning soon after operation of the plant began in September 1944. The cases were classified as to location and sources of exposure

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were traced. About 10,000 to 15,000 pounds of methyl chloride were lost daily in normal plant operation; the figure was later reduced to about 3,000 pounds daily. In the diagnosis, cases of methyl chloride poisoning were distinguished as well as possible from other conditions; all workers were instructed to report to the hospital if ill. In most cases the time of exposure could not be determined definitely. The most common symptoms were headache, nausea, vomiting, vertigo and weakness, especially of the legs. Many felt as if just getting over a drunk. Apprehension was felt in all cases. Other symptoms occurred in a large proportion of the patients; physical examination did not reveal many significant signs. The numbers of cases decreased on improving methods of protection; only three cases have occurred since April, 1945, and they involved no lost time.

Intoxication From Nitrobenzene: Report of Two Cases. P. Ravault, J. Bourret and L. Roche. Arch. d. mal. profess., 7, 305-309 (1946) (French)

A man, 23 years of age, handled nitrobenzene in a printing office. On January 17 he experienced a severe headache and asthenia, from both of which he had suffered in the preceding weeks. Next day these symptoms were intensified. At noon he lost consciousness and was brought to the hospital, comatose and strongly cyanotic. A venesection was done and oxygen administered. His face was gray, his finger nails were blue, the color of the body was normal and that of the urine was brown. There was no dyspnea, the expired air was sweet and the urine emitted a strong odor of bitter almonds. The spectroscope revealed methemoglobin in the blood. The red blood cell count was 4,300,000 and the white blood cell count was 5,000. There were no erythrocytes in the urine and no albumin, but biliary pigments were strongly positive. Palpation of the kidneys was painful. The symptoms disappeared in a week. In the second case a man 48 years of age drank nitrobenzene. He became comatose a few minutes later and died. The autopsy showed extreme cyanosis of the entire body. The abdominal cavity and the brain gave a strong odor of bitter almonds. Other findings were congestion of the kidneys and the brain and methemoglobinemia.

-- Occ. Med.

Death Following Administration of Tetrachloroethylene. R.N. Chaudhuri and A.K. Mukerji. Indian Medical Gazette, 82, 115-116 (Mar., 1947)

This case report is probably the first death caused by tetrachloroethylene, and is worth reporting because of certain complications. Tetrachloroethylene is extremely popular in the treatment of hookworm disease because of its high efficacy and lack of untoward effects. In this case it is thought that the small intestine was involved in the process of malnutrition (the patient was a 30-year old street beggar weighing 70-1/2 pounds) and was particularly vulnerable to the effects of tetrachloroethylene. It is therefore felt wise to withhold anthelmintics in hookworm cases with obvious malnutrition. Complete examination data, laboratory reports, and post-mortem report accompany this case.

-- J.I.H.&T.

Two Cases of Polyneuritis Caused by Carbon Disulfide. J. Bourret and C. Kohler. Arch. d. mal. profess., 7, 294-295 (1946) (French)

A man 29 years of age, supervising the washing of the fibers in an artificial silk factory, was exposed to carbon disulfide, hydrogen sulfide and

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carbon monoxide. After six months of work, formication in the lower extremities and difficulties in walking and gait appeared. The achilles and plantar reflexes were abolished. Improvement occurred after three weeks of treatment with strychnine. A man 47 years of age, cleaning the vessels in which cellulose and carbon disulfide are mixed, acquired a weakness of the lower extremities, especially of the quadriceps and the gluteal muscles on both sides. The achilles reflex was abolished. The flexors of the fingers were weak and there was thenar atrophy on both sides. Slight improvement took place after three months of treatment with strychnine. -- Occ. Med.

- 153 Fatal Poisoning by Lead-Benzine (A Clinico-Pathologic Study). L. Bini and G. Bollea. *J. Neuropath. and Exptl. Neurol.*, 6, 271-278 (July, 1947) (Italian)

Three cases are reported of exposure to benzine-tetraethyl-lead mixture under poor ventilation in steam-press operators in an American Army Installation in Italy. The two fatal cases were of a more intensive type. The patients were exposed 2-3 days before onset of symptoms and died in coma. The third patient left work 10 days before entering the hospital with neurological symptoms and was discharged in six weeks with residual asthenia and hypotension. The authors point out that the pathological picture is similar to that of delirium tremens and they assume that the process is the result of the ethyl radical rather than lead. -- From J.I.H.&T.

- 154 A Case of Acute Nitrogen Oxide Poisoning With Reversible Lung Changes. L. Noro and O. Gorbатов. *Nord. Hyg. Tidsk.*, 28, 101 (1947) (Swedish with English summary)

The authors report a case of acute nitrogen oxide poisoning caused by nitric acid in a jeweller's shop. After about one hour lung edema developed which could be diagnosed the next day roentgenologically. The x-ray changes disappeared in six days. Simultaneously, immediately after the poisoning, granulocytosis and an excess in the number of red corpuscles, which became normal in five days, were perceived. The sedimentation rate which increased after the poisoning, remained high during two weeks. The patient recovered completely. -- Authors' summary

Federal Grants-In-Aid Programs

The 79th and 80th sessions of Congress have been marked by a growing interest in both expanding and appraising the use of federal grants-in-aid to state and local governments in the general fields of health, education, security, and housing. There is increasing recognition of the fact that federal policy in this respect will be a major influence in determining the future role of the Federal Government and of the state and local governments in the development of social programs. At present grants in these fields alone add up to about \$1,000,000,000 a year.

-- S.L.I.S. (Feb. 4, 1948)

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- 155 Chlorine Accident in Brooklyn. H. Chasis, J.A. Zapp, J.H. Bannon, J.L. Whittenberger, J. Helm, J.J. Doheny and C.M. McLeod. Occ. Med., 4, 152-176 (Aug., 1947)

A cylinder containing approximately 100 pounds of chlorine accidentally emitted the liquid gas from a 1/8 inch orifice for 17 minutes. A large proportion of the chlorine entered a subway station through ventilators near the truck on which the cylinder was carried. Of 418 persons examined, 208 were treated in hospitals. There were no deaths. The authors describe the cases in considerable detail. The principal symptoms presented in the summary include: in the early stages, lachrymation, burning of the eyes, nose and mouth, cough, choking, and substernal pain; respiratory changes included tracheobronchitis, pulmonary edema, and pneumonia; persistent and later symptoms were suppression of breath sounds, dry (later moist) rales, and cough. In the majority of patients the roentgen changes were not remarkable and progress could be traced only by close comparison of roentgenograms. Mottling, patches of irregular density, and differences in aeration of the fields were sometimes present. Arterial oxygen unsaturation was usually present. Oxygen, under positive pressure, when possible was administered in severe cases with improvement. Penicillin and sulfadiazine apparently decreased the incidence of pneumonia. In the patients examined 16 months after discharge there was no evidence of pulmonary disease. Several patients had anxiety relations and other neurological disorders for one to 16 months.

- 156 Industrial Handling of Fluorine. R. Landau and R. Rosen. Ind. and Eng. Chem., 39, 281-286 (Mar., 1947)

Recent developments in the industrial handling of fluorine are described. The unusual physical and chemical properties of fluorine, the most reactive of all elements, are summarized and tabulated. Tables of corrosion at low and high temperatures indicate that nickel, monel, aluminum and magnesium are excellent for containers, but that few other materials except metal fluorides in their highest valence state are non-reactive with fluorine. Piping, valves, instruments, compressors, and other equipment must be selected with care for safe and economical handling, particularly at high pressure. The presence of grease in contact with fluorine may cause spontaneous ignition, and some metals and other materials give an intense flame. Inhibited reactions sometimes occur; mixtures of water vapor and fluorine may appear inert, but the reaction finally goes suddenly and violently. Storage of the compressed gas is feasible if properly protected. The physiological properties and use of protective clothing are discussed. Fluorine may cause intense burns; otherwise its effects are similar to those of hydrofluoric acid. Treatment should be instituted immediately. The effects of inhalation are serious. Fireproof neoprene on a fiber glass base has been the only material proving satisfactory against blasts of fluorine; other rubber and plastic materials may easily burn. Safety precautions for the handling of the gas are outlined, and some successful methods of disposal of waste fluorine are reviewed. Other papers in the same issue deal with safe compression and storage of fluorine.

- 157 Handling and Storage of Sulfur. Industrial Data Sheet D-P.P.5. Nat. Safety News, 57, 40, 42, 105 (Feb., 1948). Reprints available from National Safety Council, 20 N. Wacker Drive, Chicago, Ill.

Sulfur itself is virtually non-toxic, but is capable of skin irritation. Sulfur dioxide causes throat irritation at 12 p.p.m., and the maximum

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allowable concentration for periods of 1/2 to one hour is 50 to 100 p.p.m. The high irritant quality prevents most persons from inhaling sufficient quantities to get a systemic reaction. The principal hazards are fire and explosion, mechanical injury from slides, and dermatitis from the dust. Prevention of ignition by static electricity, friction, electric current, and flame by standard precautions, and fire-fighting apparatus are necessary, and exhaust systems and removal of accumulated dust are effective in preventing dust hazards.

158 Germanium. W.C. Hueper. *Occ. Med.*, 4, 208-227 (Aug., 1947)

Germanium is one of the elements with which the industrial hygienist is little concerned, because it is relatively rare, has practically no industrial use, and is not extremely toxic. The author presents a review of the literature on germanium, dealing with its physicochemical properties, compounds, and uses briefly, and pharmacology and toxicology more extensively, including his own experimental work. Germanium compounds have been suggested as bactericides and as stimulants of red corpuscle formation, but it has been shown that any action of either type is slight and of doubtful existence. No human poisonings have been reported, and the toxicological studies have all been on animals. A number of systemic effects have been recorded, and they are described in some detail. The lethal and toxic effects are much lower than those of corresponding compounds of arsenic; roughly the ratio is about 1 to 20. Lethal doses vary with the compound used and method of administration. The gas germane has toxic effects on inhalation, again much lower than those of the corresponding compound arsine. Analytical procedures for detection of germanium in organic matter are included.

+159 Health Hazards of Common Laboratory Reagents. Prudence M. Van Arsdell. *Chem. and Eng. News*, 26, 304-309 (Feb. 2, 1948)

The toxic effects of the common reagents are described briefly and tabulated, including the common soluble salts that are poisonous only on ingestion of large quantities as well as those whose vapors are toxic in small amounts. In the table the toxic effects of swallowing, skin contact, and eye contact, and first aid measures after swallowing and contact are presented.

+160 Poisoning Due to Sodium Nitrate. P. Amundsen. *Scand. Med.*, 34, 1107-1111 (1947) (Scandinavian)

Report of a mass poisoning after injection of sodium nitrate used instead of common salt. The symptom was cyanosis, and methemoglobin was shown to be present. The latent period was longer than by poisoning through nitrite. Thirteen cases were fatal. Reference is made to the literature treating the reduction of nitrate to nitrite in the intestine. Report is also made of experimental work on sodium thiosulfate, aromatic phenol-iron compounds, thionine, and methylene blue. These substances influence the methemoglobin of the blood, and will probably be of importance in the treatment of nitrate and nitrite poisoning.

-- C.A.

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- 161 A Study of Portable Vibrating Tools in Relation to the Clinical Effects Which They Produce. J.H. Agate and H.A. Druett. Brit. J. Ind. Med., 4, 141-163 (July, 1947)

Two clinical pictures which result from the use of vibrating tools are reviewed, with particular reference to the speeds of the tools, and the vibration frequencies which have heretofore been considered harmful. In the first clinical picture, Raynaud's phenomenon has been the predominant disorder, and it has arisen after the use of pneumatic hammers, from portable grinding tools, and from grinding small parts by hand. In the second, the features are pain, numbness, stiffness, and swelling of the fingers, caused by the use of high speed portable tools used for metal polishing. A thorough study of the vibrations of a large variety of tools was made, including electrical methods of analysis. The effects of a number of factors were studied, including wear of the flexible drive, and types of grinding and cutting heads, and transmission of vibrations up and down the arm were measured. It was found that vibrations of about 40 to 125 cycles per second are most concerned in Raynaud's phenomenon. Toothed metal cutters cause most disturbance, and out-of-true heads increase the vibration. Very high-speed rotary tools produce a different type of vibration, of small amplitude and high frequency, which cause the second type of disturbance in some workers without affecting others. Piston-operated tools seem to produce similar vibration spectra. A number of suggestions are put forward for reducing harmful vibrations.

-- From Authors' summary

Skin Diseases and Burns

- 162 Occupational Dermatoses (Ergodermatoses). Diagnosis, Disability and Treatment. J.G. Downing. New Eng. J. Med., 237, 755-765 (1947)

A general discussion with 11 references. Attention is directed chiefly to diagnostic criteria, medicolegal aspects, and formulas for various lotions, ointments, etc., which have proved useful in therapy of occupational dermatoses. Photographs show an eruption due to cinnamon oil, burns from chromic acid, and dermatoses arising from leather-heel trimming and shoe dressing. Warning is given against overtreatment or use of medicaments to which patients may develop hypersensitivity; such hypersensitivity has resulted from mercury compounds, sulfonamides, penicillin, and furacin (two cases recently.)

-- C.A.

- 163 Industrial Dermatitis. W.L. Macaulay. Am. Practitioner, 2, 11-15 (Sept., 1947)

The author calls attention to the high incidence of occupational dermatitis in the United States. Predisposing factors are race, personal hygiene, diet, age, season of year and family history of hypersensitivity. Industrial irritants are classified as primary and sensitizers. A non-sensitizing dermatitis is of shorter duration (21 days) than the sensitizing type (90 days). The criteria for determining the industrial status of a dermatitis are enumerated. Preventive measures are listed.

-- From J.I.H.&T.

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- 164 ✓ Sweat Band Dermatitis Due to Thiokol (or Thioprene). V. Pirila.
Acta. Derm.-Vener., 27, 287-296 (1947) (In English)

Thioprene or thiokol is used as a raw material in the rubber industry, in the manufacture of insulating material for cables, and in impregnation and surface protection of paper and textiles. On account of postwar shortage of material, paper and cloth impregnated with thioprene have been used in Finland for sweat bands of caps. Six cases of dermatitis on the forehead and other regions touched by the sweat band were traced to that source. Epidermal tests produced strong reaction in all cases to the sweat bands and to thioprene emulsion. None of the controls with other eczemas reacted to either. No connection was observed between constitutional type and the dermatosis. The condition healed quickly when the cap was no longer worn. Only one other case of contact dermatitis from thioprene other than from sweat bands is known to the author. Handling articles impregnated with thioprene does not give as long or close contact as in the case of the sweat bands.

- 165 Skin Hazards of Longshoremen and Harbor Workers. M.H. Samitz and T.E. Gibson. Ind. Med., 16, 576-577 (Dec., 1947)

Ten thousand seven hundred case histories of longshoremen and dock workers were reviewed to determine the incidence and causes of skin diseases. Three hundred eighty-five cases of skin diseases were discovered. Approximately two-thirds of these were due to physical agents, and the greater part of the remainder to chemical, mechanical and biological agents. Only a few sporadic cases of contact dermatitis were reported. In these the reaction developed at the time of direct contact. This group of workers has a very low incidence rate of skin diseases.

-- From Author's summary and conclusions

- 166 Psychotherapy in the Treatment of Neurodermatitis. M.N. Walsh and R.R. Kierland. Proc. Staff Mtgs. Mayo Clinic, 22, 578-584 (Dec. 10, 1947)

Fifteen patients with generalized neurodermatitis which had failed to respond satisfactorily to dermatologic therapy were treated with the addition of psychotherapy. Psychopathology which appeared to have causative meaning in relation to the dermatologic reaction was demonstrable in all. With one exception due to language difficulty, improvement in the emotional disorder was paralleled by a complete or nearly complete clearing of the dermatologic reaction and this improvement has endured during the period of observation. Marked improvement or disappearance of asthmatic symptoms concurrently occurred in four patients who had asthmatic syndromes. Case histories are given.

-- Authors' summary

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Free Associations of Free Men

Voluntary action to end abuses and to foster fair competitive opportunities in the public interest may be more effective than legal processes. And cooperative endeavor may appropriately have wider objectives than merely the removal of evils which are infractions of positive law.

-- (United States Supreme Court)

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Control Methods

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- 167 Control of Solvent Exposures. E.C. Barnes.
Nat. Safety News, 57, 20-21, 70-72 (Jan., 1948)

Solvents and their vapors present fire, explosion and health hazards, according to the individual characteristics of each liquid. Control of exposures requires utilization of all technical information known about each solvent. Engineering design of equipment must take into account these technical facts. Measurements must be made to determine actual employee exposure. Final results of control measures are indicated by absence of fires and explosions, and a physical examination of the employee to prove that there has been no harmful effect on his health. The system used by Westinghouse Electric Corporation for keeping records of solvent properties is described.

-- From Author's summary

- 168 Air Contamination During Machining of Beryllium Stainless Steel.
A.C. Titus. J. Ind. Hyg. and Tox., 30, 29-31 (Jan., 1948)

Data are given showing that the concentration of beryllium in the air during machining of a beryllium stainless steel can be kept under a microgram per day if a local exhaust hood is used during grinding operations.

-- From Author's summary

- 169 A Study of the Health Hazards of the Tobacco Stemming and Redrying Industry.
W.E. McCormick, Maxine Smith and S.P. Marsh. J. Ind. Hyg. and Tox., 30, 43-51 (Jan., 1948)

In processing leaf tobacco only the hanging-blending, stemming, and cleaning operations were found to present health hazards. Those due to the inhalation of free silica and insecticide dust are probably the most important. At present there is insufficient evidence relative to the hazard associated with the inhalation of nicotine. A tentative maximum allowable concentration of total dust of 10 M.P.P.C.F. is suggested. The maintenance of atmospheric dustiness below this value should control satisfactorily all of the other associated health hazards. The free silica content of dusts found in these processing plants ranged from approximately 22 per cent to 58 per cent by weight, with no significant difference between the various operations studied. A significantly lower free silica content of atmospheric dust than settled dust was observed. The Goldman modification of the hydrofluosilicic acid method of free silica analysis compared favorably in accuracy with the x-ray diffraction method. The geometric mean particle sizes of the atmospheric dust showed average values of 0.90, 0.79, and 0.85 microns respectively for the hanging-blending, stemming, and cleaning operations. Respective standard deviations of 2.86, 3.18 and 2.68 for these same operations were found. These results indicate that the atmospheric dust is hygienically significant and within the size range of industrial dusts.

-- From Authors' summary and conclusions

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- 170 Two Outbreaks of Carbon Disulfide Poisoning in Rayon Staple Fiber Plants in Poland. E.A. Paluch. *J. Ind. Hyg. and Tox.*, 30, 17-42 (Jan., 1948)

Two outbreaks of carbon disulfide poisoning have occurred in the viscose rayon industry in Poland, one during the war and the other shortly after the war. Both outbreaks occurred in rayon staple fiber plants. A higher risk is present in this process than is found in the production of normal rayon thread, chiefly because of the amount of viscose converted into rayon. In both factories the processes were not adequately safeguarded. Crowded working conditions, inadequate ventilation and in the second outbreak, damages which occurred during the war, all contributed to the hazardous situation. Conditions in the second plant were reported to the management by the investigator. An intense program of improvement was carried out which brought immediate improvement in the health conditions of the plant.

-- From Author's introduction

- 171 Recognition and Control of Fume and Dust Exposure. V.J. Castrop. *Nat. Safety News*, 57, 20, 21, 52, 73-75 (Feb., 1948)

This is a presentation of the essentials of detection and control of fumes and dust in various industries. The full paper also appeared in the Transactions of the 35th National Safety Congress.

- 172 The Foundry--A Good Place to Work. L.W. Woodhouse. *Foundry*, 75, 90-95, 223 (July, 1947); *Am. Foundryman*, 11, 40-43 (July, 1947)

In order to attract new workers, it has been necessary for foundries to modernize the plants and make them safer to work in. One Connecticut plant is taken as an example in recounting the improvements made, with a number of illustrations. They included better sanitation, a locker room, improved medical service, labor-saving devices, maximum mechanization, improved lighting, and reduction of noise. The mechanical molding at a turntable molding unit with four stations at the heart of the plant is described. A large amount of trucking of sand has also been avoided. All finishing is done under hoods. New workers and visitors now entering the plant do not immediately recognize it as a foundry, with the absence of smoke and dust. Economies of operation cannot as yet be calculated, but production per man has increased materially.

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- 173 Dust Suppression by the Use of Water. Its Day to Day Application. G.W. Saunders. *Coll. Guard.*, 175, 835-837 (Dec. 19, 1947) (Abst. of address)

The author relates in detail his company's experience in installing a wet drilling and spray system in a deep mine. Among the difficulties encountered were corrosion (using water already in the mine), mechanical difficulties with pipes, deterioration of belts and attitudes of workmen. Hand sprays failed for various reasons and were abandoned. The methods of dust suppression now used are: (1) wet cutting; (2) conveyor sprays; (3) water in all headings and cruts; (4) wetting of coal after firing; and (5) wetting of coal before filling. The men were finally convinced that proper operation of the wetting system was beneficial to them. The following are among the more important of 14 items that are essential: (1) do not use pit water unless proved to be absolutely suitable; (2) install a tank with a ball valve, on the surface; (3) use a drip feed of oil to prevent corrosion; (4) install water meters and check them daily against tonnage;

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(5) make constant experiments to increase the efficiency of dust suppression; (6) use suitable belts; (7) insist on deputies regarding the water system as a matter affecting safety; (8) be prepared to face the cost, and also the fact that dust suppression has come to stay; and (9) use effective roof control.

- 174 Killing Air-Borne Respiratory Micro-Organisms With Germicidal Energy.
M. Luckeish, A.H. Taylor, and T. Knowles. J. Franklin Inst., 244,
267-290 (Oct., 1947)

The subject is the use of germicidal lamps for sterilizing occupied rooms. Data are given on germicidal effect of radiations of various wavelength, variations with distance from the lamp, and on the effect of humidity. The authors' experiments have confirmed the observations of others, that about 10 times as much radiant energy is required when droplets remain as in dry air when they dry quickly. A duplex radial jet sampler, by which duplicate samples may be collected for exposure and for control, is described. The effect of heating by radiators was studied. The experiments showed that circulation of the air by heating or other methods increases the efficiency of sterilization. A chart shows the resistivity of various organisms. The bacteria present in saliva and introduced into the air otherwise than by dust are more easily killed than those carried by dust. Therefore an apparent reduction of 50% on all dust means a much higher efficiency against the germs for which the treatment is intended.

- 175 High Intensity Sound Works for Industry.
Anon. Business Week, No. 962, 54-57 (Feb. 8, 1948)

A number of applications of high-frequency, high-intensity sound waves are mentioned, including coagulation of smoke particles in stacks, and of other dusts. At one carbon black plant 96% of the carbon black in the smoke is recovered and sold, in addition to savings from heat loss and elimination of smoke nuisance. The finer the particles of a suspension the more readily they are coagulated. The greatest use will be in fields where dust particles are smaller than 10 microns in diameter.

Editor's Note: This subject was discussed at the Engineering Conference at the 1947 Foundation meeting and summarized in the Proceedings.

- 176 Air Conditioning Cotton Mills. A.L. Longworth.
Mod. Refrig., 49, 317 (Nov., 1946)

Spinning and weaving processes usually are carried out at temperature above that of the outside air. Heat produced by machinery is sufficient to maintain the required temperature during most of the year. Even in winter, particularly during the late afternoon, it may be necessary to provide some cooling. Heating and cooling are therefore necessary in daily as well as seasonal sequence. The power required for maximum cooling load is 10-50% of the installed machinery load. Maximum wet bulb temperature permissible must be determined by physiological considerations; minimum, that which can be used without producing a draft.

-- Refrig. Absts.

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- 177 Automobile Production at Willow Run, Providing Additional Make-Up Air at Huge Plant. R.L. Getts. Heat. Pip. and Air Cond., 20, 107-112 (Jan., 1948)

The author describes the necessity for providing additional make-up air facilities when the wartime bomber plant at Willow Run was converted to automobile production. He summarizes the various methods considered--eight in all--with data on the cost and other advantages and disadvantages of each. Plant heating, ventilating, air conditioning, and piping services are closely tied to the manufacturing processes in factories, and changes in plant operation require study and revision of these services. -- Editor's summary

- 178 A Medical and Industrial Hygiene Control Program in Widely Scattered Plants. L.E. Hamlin and H.J. Weber. Am. Ind. Hyg. Assoc. Quart., 8, 30-37 (June, 1947)

The organization of the medical and hygiene program in the 60 plants of the American Brake Shoe Company is described, and a number of details are considered briefly--psychological angles, coordination with other industrial hygiene agencies, and periodic surveys, with instances of unexpected sources of hazards brought to light. The following salient features are given in the summary: (1) Backing by top management; (2) The department is responsible only to top management; (3) Full latitude of operation is permitted; (4) Financial assistance in research problems is given; (5) Attendance at scientific meetings and membership in scientific societies at the company's expense is encouraged; (6) Authority to acquire necessary equipment is readily granted upon justification; (7) While the program can be forced from the top down, it is sold from the bottom up; (8) All divisions annually budget sums of money for improvements in plant hygiene, and the medical department has the principal voice in deciding what those improvements will be.

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Methods of Detection and Determination

- 179 Review of Automatic Indicating and Recording Instruments for Determination of Industrial Atmospheric Contaminants. W.A. Cook. Am. Ind. Hyg. Assoc. Quart., 8, 42-48 (June, 1947)

The common instruments are described, classified according to operating principle. In the instruments for determining combustible gases, the heat of combustion of the gases is measured by the potential of a thermopile or by the resistance of a wire filament. The former principle is used in the common carbon monoxide apparatus, but the latter is used for a variety of gases and the sensitivity can be varied greatly. Ultraviolet absorption is used in determination of many vapors, and has the highest sensitivity for mercury. For some other vapors and gases infra-red absorption is utilized in three possible ways: (1) selective source; (2) selective detector; and (3) negative filters. A turbidimetric method in ordinary light is used for hydrogen sulfide and carbon disulfide, which are burned to sulfur trioxide. The Thomas electric conductivity method for sulfur dioxide and the depolarization apparatus for oxygen are described. The needs for additional instruments are considered briefly.

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- 180 Spectrographic Determination of Beryllium in Biological Material and in Air.
J. Cholak and D.M. Hubbard. Anal. Chem., 20, 73-76 (Jan., 1948)

A spectrographic method for the determination of beryllium in biological material and in the air has been developed, which is capable of detecting as little as 0.25 microgram of beryllium. Details are given for the analysis of samples of freshly voided urine without ashing and for a wet-ashing procedure which is generally applicable. Methods for collecting and analyzing air samples are also given. The most satisfactory procedure consists in ashing the samples with sulfuric, nitric, and perchloric acids, isolating the beryllium as the phosphate, and dissolving the phosphate precipitate in an acid spectroscopic buffer solution. Aliquot portions (0.2 ml.) of the latter solutions are used to impregnate graphite rods which are used as the lower positive electrodes of direct current arcs. Densitometry involves the plotting of H and D curves obtained for the stepped line of beryllium at 2348.6A° and that of the internal standard, thallium at 2379.7A°, and obtaining the separation of the two curves at a constant blackening ($T = 0.50$). This separation is then evaluated from a working chart prepared beforehand from known amounts of beryllium which are added to the spectroscopic buffer solution.

-- Author's summary

- 181 The Determination of Lead in Freshly Voided Urine. A Rapid Screening Test.
J. Cholak, D.M. Hubbard and R.E. Burkey. J. Ind. Hyg. and Tox., 30, 59-62 (Jan., 1948)

A rapid, colorimetric test is described for separating persons who have been subjected to hazardous lead exposure from those whose exposure has been negligible or within safe limits. This screening test can easily be carried out by a well-trained laboratory technician. Warning is given that this test does not distinguish between lead and bismuth. Consequently, results that indicate abnormal lead absorption must be checked by a more specific and precise method. The method is most valuable when applied to groups and not to the solution of individual diagnostic problems. A list of the apparatus and reagents needed for the tests is given as well as a description of the method of procedure.

If We Can't Afford Safety

Ben Moreell, President of Jones and Laughlin Steel Corporation and a Trustee of Industrial Hygiene Foundation, says in part in an editorial in the February NATIONAL SAFETY NEWS: Safe and healthful working conditions can and will be planned by Management, but whether or not they are successful will depend upon the cooperation of every man and woman in our organization.....The careless action of one individual can jeopardize the health or safety of an entire plant. This is what occurred recently in the river steamer "Island Queen" disaster in Pittsburgh, where 19 men were killed through the carelessness of one. Although safe and healthful working conditions can be justified on a cold dollar and cents basis, I prefer to justify them on the basic principle that it is the right thing to do. In discussing safety in industrial operations, I have frequently heard it stated that the cost of adequate health and safety measures would be prohibitive and that "we can't afford it." My answer to that is quite simple and direct. It is this: **"IF WE CAN'T AFFORD SAFETY, WE CAN'T AFFORD TO BE IN BUSINESS."**

- 182 Stable Colorimetric Reagent for Chromium. J.F. Ege, Jr. and L. Silverman. Anal. Chem., 19, 693-694 (Sept., 1947)

In a modification of the *s*-diphenyl carbazide reagent for the colorimetric determination of hexavalent chromium, the major change is the substitution of phthalic anhydride for the acidic constituent. The resulting reagent is stable for weeks. It compares very well with other analytical reagents, and results in a simplified analytical procedure. The reagent is well adapted, upon the addition of glycerol, for impregnating filter papers, which are used in a direct field method for the estimation of concentrations of chromic acid mists in air.

-- J.I.H.&T.

- 183 Uranium in Urine. H.M. Wilson and A.A. Smales. Nature, 158, 590 (1946)

Analysts (14) who had been in contact with magnesium uranyl acetate solution for two months had urine containing 2-10 micrograms per liter of uranium. Eight who had not been in such recent contact with uranium salts varied from not detected to 4 micrograms per liter. One of the solutions used by these analysts was made by saturating alcohol with sodium magnesium uranyl acetate. It is believed that this solution is more likely to penetrate the skin. No deviation from normal health was found in the analysts examined.

-- C.A.

- 184 Determination of Tellurium in Air Collected in Ferrous Foundries. A.N. Setterlind. What's New in Ind. Hyg., 4, 11-14 (Apr.-June, 1947)

The literature on determination of tellurium is examined critically for application to its estimation in air. Most of them, applying to larger quantities, were found impracticable. The A.O.A.C. method for selenium in soil, consisting of distillation, subsequent reduction with sulfur dioxide and hydroxylamine, suspending in gum arabic and reading against turbidimetric standards, was found applicable by using some modifications and observing suitable precautions. Full directions are given.

- 185 Analysis and Disposal of Fluorine. S.G. Turnbull, A.F. Benning, G.W. Feldmann, A.L. Lynch, R.C. McHarness and M.K. Richards. Ind. and Eng. Chem., 39, 286-288 (Mar., 1947)

A safe analytical method for industrial use has been developed for the analysis of high quality fluorine. This method is based upon the reaction of hydrogen fluoride with sodium fluoride, the conversion of fluorine to chlorine by reaction with sodium chloride, and analysis of the chlorine for oxygen and inert gases by standard methods. The over-all error in fluorine purity by this method is indicated to be less than 0.4%. A safe method for the disposal of waste fluorine on a large scale has been developed and satisfactorily operated. The waste fluorine is burned with hydrocarbon gases, and acid products formed are removed from non-toxic carbon fluorides by scrubbing with water and sodium hydroxide.

-- Authors' summary

- 186 Automatic Detection and Estimation of Harmful Gases. H.R. Hindley. Manuf. Chemist, 18, 546-549 (Dec., 1947)

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The principles of various methods of detecting and estimating gases are described briefly and instruments (made in Great Britain) for use of the

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methods are described and illustrated. They include physical means, explosive potential, infra-red absorption, photoelectric detection, and thermal conductivity. Other methods now in the laboratory stage are mentioned, including use of a catalytic platinum, ultraviolet rays, and magnetic properties of oxygen.

- 187 Determination of Nitromethane in Air. H.N. Wilson and W. Hutchinson. Analyst, 72, 432-433 (1947)

Evacuate a "winchester" of known volume to about 30 mm. of mercury pressure and take the temperature. Then open it to the atmosphere which is to be tested and take its temperature. Introduce 50 ml. of a 0.2 normal sulfuric acid by cooling the winchester slightly and allowing the acid to enter. Shake well and allow to stand for 30 minutes. Polarograph the solution without deoxygenating, at a suitable sensitivity, e.g. 1/700 or 1/70 over the voltage range--0.13-1.3 vs. the saturated calomel electrode. Prepare a graph by polarographing known quantities of nitro methane dissolved in known volumes of 0.2 normal sulfuric acid. The method proved satisfactory for determining 0.224-13.7 mg. of nitromethane per liter. Other nitroparaffins will behave similarly. -- C.A.

- 188 Determination of Small Amounts of Hexachlorocyclohexane (Benzene Hexachloride). B.H. Howard. Analyst, 72, 427-431 (1947); Chem. Absts., 42, 489-490 (Jan. 20, 1948)

This chloride is a mixture of isomers of which the gamma isomer (gammexane) is strongly insecticidal. The method described in this paper is readily applicable to foodstuffs, is suitable for the routine testing of many samples and is sensitive to a few gamma of hexachlorocyclohexane. No method is known, however, for distinguishing it from other insecticides, such as DDT or for distinguishing gammexane from its isomers. Sufficient details for application of the method are given in the Chem. Absts. reference.

- 189 Polarographic Micro-Measurement of Benzene in Biological Fluids and in Air. S. Skramovsky and J. Teisinger. Arch. d. Mal. Profess., 8, 22-25 (1947) (French)

A method for the determination of benzene in biological fluids and in air is presented. In this process benzene is driven by an air current into a mixture of sulfuric and nitric acids (sulfonitric), which transforms it to dinitrobenzene, and is measured polarographically. The sensitivity of this method is in the neighborhood of 0.1, corresponding, for a 3 cc. sample of blood, to 20 micrograms per 100. The value of 20-30 micrograms per 100 represents the limit above which benzene is pathologic in the blood. In the urine, for which one can use a larger amount, the sensitivity approaches 1 microgram per 100. The precision of the measurement is fixed by the exactitude of evaluating polarograms, that is, 5 per 100. The values in normal blood were determined, and the method applied to animals poisoned by benzene.

-- J.I.H.&T. Translation of Author's Resume

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Laboratory Toxicological Studies

- 190 Further Experience With the Range Finding Test in the Industrial Toxicology Laboratory. H.F. Smyth, Jr. and C.P. Carpenter. *J. Ind. Hyg. and Tox.*, 30, 63-68 (Jan., 1948)

There are presented elaborations of the Range Finding Toxicity Test in respect to sub-acute toxicity, vapor inhalation, and skin sensitization. Further examples of the use of the test are given. -- Authors' summary

- 191 Basophil Granulation: Temporary Test During the Course of Experimental Lead Poisoning. M. Duvoir, L. Derobert and A. Hadengue. *Arch. d. Mal. Profess.*, 8, 1-3 (1947) (French)

Experiments with guinea pigs were conducted, which corroborated the previous observation of the authors that the appearance of basophil granulation stippling in erythrocytes is not constant during the course of lead poisoning. The granulations appear shortly after the initiation of intoxication, become at first very numerous, and then diminish progressively, and entirely disappear before the death of the experimental animal. Addition of manganese to the lead dosage and blocking of the reticulo endothelium system by congo red appear to have no effect on the course of intoxication. -- J.I.H.&T.

- 192 The Antipernicious Anemia Factor in Lead Poisoning. M. Lourau. *Bull. soc. chim. biol.*, 29, 34-43 (1947)

The anemia produced by mild lead poisoning in rabbits is like human pernicious anemia in that it responds to liver and stomach extracts containing the antipernicious anemia factor. This factor is abundant in liver and stomach tissues of normal rabbits but decreases to a very low level during chronic lead poisoning. -- C.A.

- 193 Tellurium. III. The Toxicity of Ingested Tellurium Dioxide for Rats. R.H. DeMeio and W.W. Jetter. *J. Ind. Hyg. and Tox.*, 30, 53-58 (Jan., 1948)

The effect of feeding "ad libitum" 375,750 and 1,500 p.p.m. of tellurium dioxide, to white rats weighing from 95.5 to 123.5 grams for 26 to 128 days has been studied. Rats fed tellurium failed to grow, as compared to the controls. This effect may have been due partially at least to malnutrition, because of decreased food intake. Rats on the 1,500 p.p.m. tellurium diet died after 26 days, while the others survived. Rats fed tellurium showed loss of hair, redness and edema of the digits and temporary paralysis of the hind legs. These symptoms were more severe in the rats with the highest tellurium intake. Oliguria and anuria was observed in some of the rats. No definite change in hemoglobin concentration was observed. Oxygen consumption of brain, kidney and liver slices, was within the same limits for tellurium fed and control rats. Pathological studies indicated that tellurium was necrotizing to hepatic parenchyma and the tubular epithelium of the kidneys. -- Authors' summary

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- 194 Antimony Trisulfide. F.M.R. Bulmer and J.H. Johnston.
J. Ind. Hyg. and Tox., 30, 26-28 (Jan., 1948)

A report including air analyses and blood and urine findings, is given, on a gross exposure to antimony trisulfide dust. The investigation suggests a low toxicity for antimony trisulfide dust under the conditions reported. It would appear that antimony trisulfide dust of the particle size encountered, when inhaled, is not readily absorbed into the body. The situation may be different in the case of antimony fumes because of the much smaller particle size of this material.

-- Authors' conclusions

- 195 Toxicological Studies on Laboratory Animals of Certain Alkyldinitrophenols Used in Agriculture. H.C. Spencer, V.K. Rowe, E.M. Adams and D.D. Irish.
J. Ind. Hyg. and Tox., 30, 10-25 (Jan., 1948)

Studies on rabbits have shown that none of the dinitrophenols investigated are appreciably irritating to the skin; but three of five compounds can be readily absorbed through the skin in lethal amounts. All of the dinitrophenols studied were found to be rapidly acting materials of a fairly high order of acute oral toxicity. The survival dose of the various compounds ranged from 0.005 to 0.060 g. per kg., while the lethal dose range was 0.060 to 0.600 g. per kg. Male rats fed for six months on diets with concentrations ranging from 0.01 per cent 2-sec-butyl-4,6-dinitrophenol to 0.05 per cent 2-cyclohexyl-4,6-dinitrophenol compound with dicyclo-hexylamine exhibited no appreciable ill effects. There is very little summation of toxic effects upon prolonged ingestion. Cataracts were produced in ducklings when fed certain compounds for as long as 38 days. A discussion is given of the practical handling problems associated with the use of the dinitrophenols. Health problems that may arise from skin contact, inhalation, or ingestion are considered.

-- From Authors' summary

- 196 Glucuronic Acid Excretion After Diethylene Glycol Monoethyl Ether (Carbitol) and Some Other Glycols. J.K. Fellows, F.P. Luduena and P.J. Hanzlik.
J. Pharm. and Exper. Therap., 89, 210-213 (Mar., 1947)

Diethylene glycol monoethyl ether, widely used in cosmetics and industrial products, is largely destroyed in vivo after internal administration, but animal experiments described in this article indicate that the small undestroyed portion is excreted conjugated with glucuronate. Thus, gastric or hypodermic administration of diethylene glycol monoethyl ether (and also of propylene glycol) in rabbits produced increases in daily urinary excretion of glucuronic acid; ethylene glycol, diethylene glycol and glycerol did not. No increase in urinary glucuronic acid excretion was found in humans after epidermal applications of 20-50% ethylene glycol monoethyl ether.

-- J.I.H.&T.

- 197 The Acute Toxicity of Ethylene Imine to Small Animals. C.P. Carpenter, H.F. Smyth, Jr. and C.B. Shaffer. J. Ind. Hyg. and Tox., 30, 2-6 (Jan., 1948)

The inhalation of ethylene imine vapors at a concentration of 25 p.p.m. or above for eight hours will kill rats and guinea pigs by a combination of lung injury and necrosis of kidney tubular epithelium. Death may be delayed several days after an asymptomatic period. Within 30 to 60 minutes 250 p.p.m.

is dangerous to life. In single exposures the compound is several times as toxic as some commonly used amines. Its toxicity by mouth is high; in fluid form it penetrates the skin readily but its vapors do not. It is a skin sensitizer and necrotizing agent. These actions must be guarded against in any industrial application of the monomer. -- Authors' summary

- 198 A Comparison of Acute Toxicities of Ethylene Imine and Ammonia to Mice. S.D. Silver and F.P. McGrath. *J. Ind. Hyg. and Tox.*, 30, 7-9 (Jan., 1948)

The LC_{50} of ethylene imine for mice, for an exposure period of 10 minutes and an observation period of 10 days, was found to be 3.93 ± 0.42 mg./l. (1.96 S.E.). The LC_{50} of ammonia for mice under the same conditions was found to be 7.06 ± 0.32 mg./l. (1.96 S.E.). Deaths from ethylene imine occurred over the 10 day observation period, with a primary peak at the second day and secondary peak at the fourth and fifth days. Practically all deaths from ammonia occurred during actual exposure. Despite the fact that both compounds are strongly alkaline in nature, the modes of physiological action are evidently different. -- Authors' summary

- 199 The Chronic Toxicity of Hydroxyethyl Cellulose for Rats. H.F. Smyth, Jr., C.P. Carpenter and C.S. Weil. *J. Am. Pharm. Assoc., Sci. Ed.*, 36, 335-336 (Nov., 1947)

A parental and an F₁ generation of Wistar strain albino rats totaling 52 for each dosage level and control were maintained for two years upon diets containing added "Cellosize" hydroxyethyl cellulose WPLM in concentrations of 5, 1 and 0.2 per cent. The resulting mean dosages were, respectively, 2.31, 0.41, and 0.09 Gm./Kg./day. The dosages were devoid of effect, except that the food intake of rats eating the 5 per cent diet was one-tenth greater than that of animals in the other three groups. The results are indirect evidence that the compound is neither absorbed nor hydrolyzed in the gastrointestinal tract. -- Authors' summary

Radioactivity and X-Radiation

Plutonium Project Symposium. Given at 32nd annual meeting of the Radiological Society of North America, Chicago, Illinois, December 1-6, 1946. *Radiology*, 49, 271-348, 361-363 (1947)

- 200 Components of the Acute Lethal Action of Slow Neutrons. R.E. Zirkle. pp. 271-273.

Various groups of mice were exposed to graded doses of slow neutrons as determined by measuring the radioactivity induced in suitable metal foils. The number of mice surviving for three weeks was plotted against dose, and the resulting curve showed that the 50% survival dose was 4.2×10^{12} slow neutrons per sq. cm. of mouse. Partial doses were due also to fast neutrons, gamma rays, protons, and carbon nuclei, radioactivity, and other mechanisms. -- C.A.

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- 201 Biological Studies in the Tolerance Range. Margaret K. Deringer. pp. 274-285.

Long-continued absorption of penetrating radiation is associated with damage even for doses of 0.11 r. given in eight hours per day. A permissible dose for chronic irradiation is defined as one in which the damage cannot be expressed in pathologic changes. It is of paramount importance that the present permissible dose of 0.1 r. per day be maintained. -- C.A.

- 202 The Hematological Effects of Ionizing Radiations in the Tolerance Range. L.O. Jacobson and E.K. Marks. pp. 286-298.

Lymphocyte reduction in the peripheral blood is the most sensitive indicator of acute or subacute exposure to externally originating or internally deposited radioisotopes. No hematological change is detected in mice, rabbits, or guinea pigs with a daily whole-body exposure to 0.1 r. of gamma radiation extending over three years. Changes may be observed for doses above 1.1 r. per day, with guinea pigs most sensitive, followed by mice and rabbits. Human beings subjected to whole-body x-ray exposure totaling 300 r. given in divided daily doses of 5 to 20 r. showed a degree of sensitivity of the hemopoietic system roughly comparable to that of the guinea pig and the dog. -- C.A.

- 203 The Clinical Sequence of Physiological Effects of Ionizing Radiation in Animals. C.L. Prosser and others. pp. 299-313.

On the basis of extensive experiments it is concluded that every kind of ionizing radiation is similar in its clinical action. Nearly every organ system is affected by lethal doses of every type of radiation, and no single clinical reaction is peculiarly specific for irradiation damage. The clinical picture and the conditions resulting in death vary with the dose rate and the duration of exposure for both external and internal radiation. If an animal survives one depression it is likely to die later from a different mechanism. -- C.A.

- 204 Effects of Total Surface Beta Irradiation. J.R. Raper. pp. 314-324.

Owing to superficial absorption, irradiation with beta-rays in doses below the acute lethal range results in greater gross and superficial damage than that following irradiation with the more penetrating x- or gamma-rays. A single dose of 4,000 r.e.p. (roentgen equiv. phys.) delivered in one hour first produces visible damage in mice about a week after irradiation with inflammation of the eyelids. Successive changes end in death. Rats require about double the same dose. Single sublethal total surface doses induced the formation of tumors in these but not in guinea pigs and rabbits. -- C.A.

- 205 The Metabolism of the Fission Products of the Heaviest Elements. J.G. Hamilton. pp. 325-343.

All radioactive elements that accumulate in bone with the exception of strontium are not deposited in the mineral structure of the bone, but are localized in and adjacent to the osteoid matrix. The large fraction of lanthanum, cerium, praseodymium, 61, americium and curium deposited in the liver was an unexpected finding, and it may be predicted that the same will be true from neodymium, samarium, and europium. -- C.A.

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- 206 Histological Changes Following Radiation Exposures. W. Bloom. pp. 344-348.

Effects were independent of a wide variety of types of radiation except for beta rays. No evidence was found for a stimulating effect of low doses of x-rays. Mitosis or meiosis is not a predisposing factor determining radiosensitivity. -- C.A.

- 207 Carcinogenic Properties of Radioactive Fission Products and of Plutonium. H. Lisco, Miriam P. Finkel and A.M. Brues. pp. 361-363.

A total of one microgram of plutonium or one millicurie of yttrium phosphate injected under the skin induced fibrosarcomas even though a certain portion of the injected dose was removed from the site of the injection and was distributed throughout the body and partially excreted. Bone tumors appeared in animals injected with plutonium at levels ranging from 4.5 to 0.05 microgram per gram. The minimum latent period was 200 days. The majority of plutonium-induced tumors occurred in the spine, often producing hind-leg paralysis and urinary retention as first symptoms. Carcinoma occurred in the colon of rats fed yttrium 91. -- C.A.

- 208 The Deposition of Radioactive Metals in Bone as a Potential Health Hazard. D.H. Copp, Dorothy J. Axelrod, and J.G. Hamilton. Am. J. Roentgenol. Radium Therapy, 58, 10-16 (1947)

Radio-strontium follows the path of calcium metabolism and is deposited only in the bone salts, whereas radioactive plutonium, yttrium, and cerium are laid down in the uncalcified organic matrix of bone in contrast to the accepted view with regard to behavior of other heavy metals which deposit in the skeleton. Radio-strontium is eliminated more readily with a biologic half life of three to four months. The other elements mentioned are excreted very slowly with a biologic half life of one to three years. -- C.A.

- 209 Tolerance Concentrations of Radioactive Substances. K.Z. Morgan. J. Phys. and Colloid Chem., 51, 984-1003 (July, 1947)

This paper is a summary of a report to appear in a volume of the Plutonium Project Record. The treatment is largely mathematical, with the object of calculating the effects of fixed amounts of long- or short-lived radioactive materials in a given organ of the body, when the distribution of the activity in the organ is known.

Twelve consecutive years without a lost-time accident----that's the safety record of the hot mill department at Wood Works of the U.S. Steel's plant at McKeesport, Pa. Reasons for this remarkable achievement are several: frequent meetings between foremen and workers on safe practices, constant efforts to improve the skill of the employees, continuous stress on the safe way as the only right way to do a job, and improved safety devices.

-- The Foreman's Letter (December 4, 1947)

- 210 Some Observations on Radiation Sickness and Its Treatment. S. Kullander.
Acta Radiologica, 28, 221-224 (1947) (Scandinavian)

In severe radiation sickness with vomiting, a definite insufficiency of the production of hydrochloric acid in the stomach is present, even when the ability to produce hydrochloric acid is normal under other conditions. Medication by means of hydrochloric acid has been shown to be a satisfactory therapeutic measure in combating radiation sickness, which also appears to be alleviated by injections of histamine. These observations definitely contradict the theory that histamine or similar substances can be etiological factors in the causation of radiation sickness. -- Author's summary

- 211 Radiological Safety. P. Lemler. Safety Rev. (U.S. Navy), 1, 4-9 (Jan., 1948)

An address covering hazards from exposure to radiation, protective devices, detection instruments, devices for cumulative measurement, and safety organization.

Industrial Relations, Personnel

- 212 Union's Shift to "Paternalism." Anon. U.S. News, 24, 30, 31 (Feb. 13, 1948)

Unions now want more from employers than wage increases. Demands are being shifted to include social-security benefits. John L. Lewis is setting the pace with a demand for pensions of \$100 a month for miners who retire at the age of 60. Maternity care, old-age benefits, and unemployment insurance are among the immediate benefits for which employers are asked to pay. Long-term aims seriously considered are a weekly-pay guarantee and a guaranteed annual wage. Welfare plans are already in operation in many cases, but in many cases the unions have been able to provide group insurance, health centers and recreation facilities. The question of whether employers must bargain with unions over insurance plans is before N.L.R.B. for decision.

- 213 Influencing and Measuring Employee Attitudes. Personnel Series No. 113, American Management Association, 330 West 42nd St., New York 18, N.Y. 56 pp. (1947)

The first paper, on "Getting Information to Employees and the Public," by C.W. King, tells how Allegheny Ludlum Steel Corporation presents facts to its employees and the community about its regard for employees and neighbors, about wages, profits, and its desire to prevent "boom and bust" conditions. Other papers are "Discovering and Evaluating Employee Attitudes" by J.C. Worthy; "A Union View of Plant Newspapers" by L. Rogin; "Pattern for Management Unity" by F.C. Hawker; and "Stimulating Teamwork Between Foremen and Union Stewards" by H. Long.

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- 214 Wage Rate and Contract Provisions. Report "C," Collective Bargain Bulletin, National Foremen's Institute, Deep River, Conn. 81 pp.

This report analyzes the collective bargaining contracts concluded since June 23, 1947, when the Taft-Hartley Act became effective. Out of the varied provisions that are changed, a few mention welfare funds or plant conditions. Three new contracts in New Jersey, two in New York and one in Wisconsin include health or life insurance or both, free medical service is provided in a hotel association contract in New York, and some minor sanitary features are mentioned in one of the New Jersey contracts.

- 215 How Well Can Management Predict? W.A. Hamor. Advanced Management, 12, 159-164 (Dec., 1947). Reprints available from Foundation office.

Predictions are commonly made in every area of professional and business life. Based thereon, measures are taken in advance to secure immunity from hazards. Prediction based on the natural sciences and arts has been made exact. The author uses two illustrations, the construction of a building, and the development of a new industrial process, to show how experiment and prediction are interdependent through many stages of development. Prediction based on human behavior cannot be made as exact as in these examples, but accurate prediction calls for an understanding of many factors in behavior. There is therefore great need of the study of psychology and the social sciences on the part of management, not only to secure the best cooperation of employees, but also to be of most service to customers. The final paragraph is most pertinent to the latter point: "A prediction is appropriate in closing. In the industrial research of the future, less and less attention will be directed to adaptations of products from the standpoints of their manufacturers, and more and more attention will be devoted to functions of products from the viewpoints of consumers. These products will be regarded as carriers of social value. There will probably be more casualties among old products, more replacement by new products, more opportunity for the application of scientific ability. Reactions of consumers, conducive to good relations with them, will be derived more from their direct perception and knowledge and less from inference and persuasion."

Public Health

- 216 BCG Vaccination in All Age Groups. S.R. Rosenthal, E.I. Leslie and E. Loewensohn. J.A.M.A., 136, 73-79 (Jan. 10, 1948)

The application of BCG vaccination to all age groups is a safe and effective procedure. Comparative figures on incidence of tuberculosis in vaccinated and unvaccinated groups varied from 2 to 5 (babies from tubercular homes, with isolation in foster homes) to none in the vaccinated group (federal housing project, nursing and medical students and patients in a mental institution.)

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Miscellaneous

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- 217 The Effect of Blood Carboxyhemoglobin Concentration on Hypoxia Tolerance.
G.C. Pitts and N. Pace. *Am. J. Physiol.*, 148, 139-151 (1947)

The effects of various levels of blood COHb (carboxyhemoglobin) and of various simulated altitudes on the physiological response to exercise were observed in a group of 10 normal men. The COHb conditions were: 0, 6 and 13% COHb increase at simulated altitudes of 0, 7000, 10,000, and 15,500 ft. These altitudes were simulated by having the subjects breathe appropriate mixtures of oxygen and nitrogen so as to produce arterial oxygen saturations corresponding to those found at the altitudes listed above. On the basis of the changes in pulse rate it was possible to derive a quantitative estimate of the effect of blood COHb on hypoxia tolerance. The increment in response per 1% increase in blood COHb was equal to that observed by raising a normal group 335 ft. in pressure altitude. This value was determined for the altitude range of 7000 to 10,000 ft. and/or increases in blood COHb of at least 13%.

-- C.A.

- 218 Acclimatization to Extreme Cold. S.M. Horvath, A. Freedman and H. Golden.
Am. J. Physiol., 150, 99-108 (July, 1947)

Metabolic studies were made on five men who were subjected to three days at 25° C., eight days at -29° C., and again three days at 25° C. One of the subjects breathed air at a temperature of about 20° C. during the cold period. No changes in basal values for heart rate or rectal temperature occurred, though caloric expenditure was greater during the low ambient temperature: the duration of exposure did not markedly influence the degree of elevation of energy output. The single subject breathing air at room temperature, however, showed a striking decrease in caloric output during the cold period, which may indicate an acclimatization, and did not, like the others, display evidence of any after-stimulating effect of cold. Energy requirements for work on a treadmill increased in the cold atmosphere; this elevated level gradually decreased upon prolonged exposure, but its relation to a state of acclimatization was not clear.

-- J.I.H.&T.

- 219 Effects of Climatic Extremes. M. Critchley.
Brit. J. Ind. Med., 4, 164-189 (July, 1947)

The author presents a thorough review of the literature on the effect of climate on civilized man and his work. The greater part of the literature deals with hot climates as that has been of most concern. Arguments for and against the hope of continued survival of the white race in the tropics are given. The terms relating to temperature, humidity and thermal comfort are defined and their measurement is described. Psychological efficiency in the heat and cold and physiological responses to heat and cold are discussed extensively. Protection against extremes of heat, housing, food, and drink are considered, and many of the older beliefs and practices, still held in some quarters, are shown to be wrong. Protection against insects and micro-organisms are as much a factor in residence in tropical countries as protection from heat. Air-conditioning offers hope of great improvement in comfort

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in the tropics. There are many problems still to be considered. Speaking in conclusion about protection from the sun, but referring as well to other points discussed, the author says: "While the pendulum is still swinging back and forth between sedulous self-exclusion from the sun and a kind of fanatical sun-worship, it is difficult to lay down authoritative rules for the tropics. Common sense suggests, as usual, the happy mean."

- 220 Anoxia and the Central Nervous System: Experimental and Clinical Study.
B.G.B. Lucas. Thorax, 1, 128-142 (1946)

The effects of prolonged mild anoxia on the central nervous system are described. Rats were exposed constantly or intermittently to an atmosphere of 9% oxygen for 60-70 hr., with the production of neurological damage and often death. Eight human cases are reported in which anoxia may have been the cause of death or of neurological damage; most cases were associated with temporary respiratory or cardiac arrest under anesthesia, especially in association with thoracic surgery. The pathological findings in both animal and human brains were cellular degeneration affecting especially the pyramidal cells, and gross capillary dilatation sometimes with multiple hemorrhages. -- Brit. Absts.

- 221 Investigation of the Transmission of Light Through Suspensions.
A.H.M. Andreasen. Tek. Tidsk., pp. 467-474, 10 figs. (May 11, 1946)
(Scandinavian)

Using a chemical method of preparing suspensions of uniformly-sized particles, the author has studied the absorption of light in suspensions as a function of particle size. The results are of interest in connection with the examination of dust by photo-electric sedimentation and indicate a failure of the Lambert-Beer law. -- Bull. Hyg.

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